

The background is a rich, warm-toned surface, possibly a wooden table, covered with a fine layer of red-orange powder. Various spices are arranged around the central text: a bowl of yellow turmeric powder at the top right, a bowl of green cardamom pods on the left, a bowl of brown cumin seeds at the top center, a bowl of red chili powder at the top left, and a bowl of red peppercorns at the bottom right. Scattered spices include star anise, bay leaves, nutmeg, and cinnamon sticks. The word 'SPICE' is written in large, bold, white capital letters across the center.

# SPICE

Understand the science of spice, create exciting new blends, and revolutionize your cooking

Dr. Stuart Farrimond







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# FOREWORD

Many cooks are intimidated by spices. All too often, a pot of spice is bought for a recipe then pushed into the gloomy depths of a kitchen cupboard, where it remains untouched for many years. This should not be so, for spices are the lifeblood of countless dishes. Neglecting spices does a disservice to a cook's culinary talents. They not only enhance the natural flavors of a dish, but can bring new flavors and aromas to familiar foods, exciting all our senses. To cook without spices is like composing an orchestral opus without a string section; cooks who view spicing as a grind of black pepper or a spoon of curry powder need to embrace the richness that spices can offer.

This book is for cooks who want to experience new flavor combinations that will both excite and delight. Prescriptive recipes can frustrate the creative cook, but until recently, the only way to know which spices would blend together was by trial and error. Personal experience, tradition, and a sprinkle of intuition were the ingredients for making spice mixes. Not anymore, because scientific discoveries have turned old-fashioned ideas on their head. Spices can be blended and added to dishes that had not previously been considered, and no one should be shackled by recipes from chefs, internet "gurus," or family tradition. This book is the culmination of an ambitious, never-before-attempted project that aims to serve up some easy-to-follow, science-based principles that will hopefully transform the way you use spices in your cooking.

It is important that ancient wisdom is not cast aside, however. Centuries of cooking experience are the bedrock of every country's food heritage, and

here you will explore the traditional range of spices used in key regions and countries around the world. A variety of top chefs who specialize in different regional cuisines have contributed some of their favorite spice mixes and recipes. Rather than starting from a blank canvas, you can use the spice blends as a foundation upon which new creations can be built. The recipes showcase some of these blends, and also suggest using innovative spice combinations to add a tantalizing twist to familiar dishes.

Whether you're an experienced cook or a complete beginner, I hope that you will be inspired and empowered to unleash your culinary talents. Add a sprinkle of flavor science or ladle in dollop-loads; let this guide open up a world of sensational new gastronomic delights. Never again will your spice jars languish in the dark!



*Dr. Stuart Farrimond*



“

*This book serves up easy-to-follow, science-based principles that will transform the way you use spices.*

”









# **SPICE** | *science*

*Understand the science behind how spices work,  
discover flavor compounds and flavor groups, and learn  
how to create inspired spice blends.*

# WHAT IS A SPICE?

Spices are plant parts that are more densely loaded with flavor than most other ingredients used in cooking. Whereas herbs always come from leafy parts, spices tend to derive from seeds, fruits, roots, stems, flowers, or bark, and are usually dried. That said, some strongly flavored leaves, such as bay and curry leaf, can be considered spices because they are used more as a potent background flavoring than as a fresh addition.

## *Chemical stores*

Spices have been valued throughout history, in religious ceremonies and medicine as much as in cooking. Science has shown us that these once-mystical plant parts are in fact the vessels of chemicals known as flavor (or aroma) compounds, generated to help plants survive and reproduce, performing roles such as repelling animals or protecting against bacteria. By happy coincidence, many of these compounds have aromas that are pleasant to humans.

“  
*Spice flavors are chemicals produced by plants, often for defence.*  
 ”

### STEMS

The stem of a plant distributes water and sugars to where they are needed. Few spices derive from stems: lemongrass is the stalk of a tropical grass and little-known mastic is the dried resin collected from lentisk trees; more famously, cinnamon and cassia are dried pieces of inner and outer bark, respectively, of *Cinnamomum* trees.

#### **Cinnamon**

New shoots of coppiced trees are stripped for their inner bark to produce cinnamon.

**Inner bark**  
 is left to dry  
 in the sun



**Dried bark**  
 is rolled by  
 hand to form  
 “quills”

#### **Communication**

The spicy, woody aroma of cinnamon comes from a chemical compound called caryophyllene. When a plant is being eaten, its role is to act as an airborne signal that “primes” downwind plants to produce defensive chemicals.

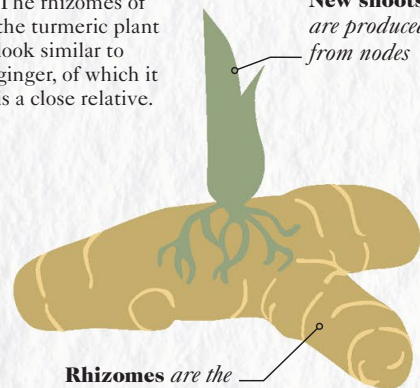
### ROOTS AND UNDERGROUND STORES

Roots are a plant’s lifeline to water and nutrients, and rhizomes, corms, and bulbs are storage chambers with the ability to produce new shoots and roots. Licorice comes from dried roots and asafetida is derived from dried root sap. Turmeric, ginger, galangal, and garlic are all examples of underground stores.

#### **Turmeric**

The rhizomic plant look similar to ginger, of which it is a close relative.

**New shoots**  
 are produced  
 from nodes



**Rhizomes** are the  
 plant’s food store and  
 comprise up to  
 70 percent  
 carbohydrate

#### **Animal deterrent**

Turmeric’s flavor profile includes a powerful compound called cineole, which has a strong, penetrating, slightly medicinal flavor and has evolved to act as a bitter-tasting deterrent to animals who try to eat the rhizomes.

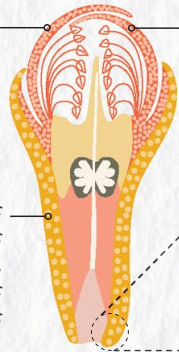


**Flavor stores**

The vast majority of flavor compounds in spices are oil- rather than water-soluble and are stored within bubbles of oil. Spices are structured to keep these oils locked away, to be released only if the plant is damaged or attacked by infection. Once the bubbles rupture and the oil is exposed to air, the flavor compounds quickly evaporate into gases.

**Round head** is made up of the dried, unopened petals of the bud

**“Stalk”** comprises the outer sepals of the flower bud, and also contains oil glands

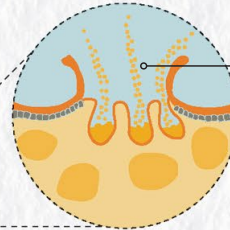


**Oil glands** are more concentrated in the round head of a clove

**Cross section of a clove**

Cloves are rich in highly flavored oils, stored in oil glands just beneath the surface of both the rounded top of the bud and the “stalk.”

**Glands rupture** when the outer surface is damaged. In the kitchen this happens through bruising, grinding, and application of heat. Flavor compounds in the released oils evaporate as a fragrant gas.



**FRUITS**

The seeds of flowering plants are contained in fruits. Many have evolved to be sugar-rich so they make an appealing meal for animals, who thereby distribute the seeds over a wide area. Numerous spices are derived from fruits, including allspice, sumac, vanilla, and chilis. Several “seed” spices are technically fruits, including dill and ajwain.

**Black pepper**

Peppercorns are the small dried berries of one of around a thousand different flowering vine species in the plant family *Piperaceae*.



**Berries** are carried in clusters on spikes

**Fully ripe berries** are pink-red in color; black and green peppercorns are picked when underripe

**Insect repellent**

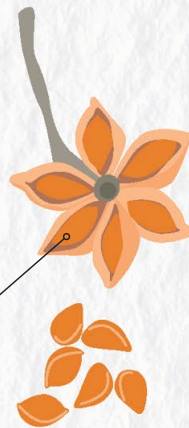
The heat from pepper is produced by a chemical called piperine which, as well as irritating hot pain nerves on the tongue, is highly repellent to insects and has been harnessed by the chemical industry as an insecticide.

**SEEDS**

The majority of spices are seeds; think of cumin, cardamom, mustard, and fenugreek, or less obviously nutmeg, which is a seed kernel. It is little wonder that plants frequently concentrate their strongest-tasting defensive chemicals in seeds, since these are the precious packets of new life that will sprout into the next generation of plants.

**Star anise**

The seeds of this strikingly shaped spice are contained within a woody protective covering, called a carpel, where much of the flavor is in fact concentrated.



**Seed pods (fruits)** are harvested when still unripe and allowed to dry

**Health protection**

Star anise’s dominant flavor comes from anethole, a substance that appears to have evolved to fight off infections and repel insects, and which incidentally has an appealing taste—13 times sweeter than sugar—to the animal tongue.

**FLOWERS**

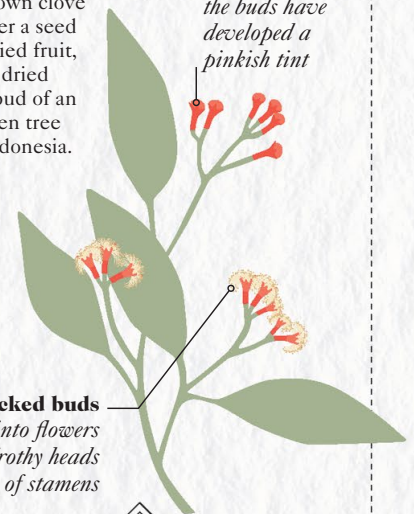
Many flowers are known for their attractive aromas, which have evolved to entice insects into paying a visit and pollinating the flower as they do so. Only a few have strong enough appealing flavors to be considered a spice, most famously saffron, whose red strands are pollen-receiving female sex parts (stigmas) of a crocus flower. Another notable flower spice, it may be surprising to discover, is clove.

**Clove**

The nail-shaped, dark brown clove is neither a seed nor a dried fruit, but the dried flower bud of an evergreen tree from Indonesia.

**Fresh cloves**

are picked when the buds have developed a pinkish tint



**Unpicked buds** open into flowers with frothy heads of stamens

**Pollinator attraction**

Clove contains a high concentration of eugenol, a chemical with a warm, eucalyptus-like fragrance and sweet effect on the tongue. In the living plant, eugenol serves to attract pollinating insects and also repel infections and pests.



# SPICES AND THEIR FLAVOR COMPOUNDS

Flavor compounds are the tiny molecules that give each spice its unique flavor. When in the mouth, these molecules waft up the throat as a vapor into the nose, where they are experienced as if coming from the tongue. For the cook, learning about these flavor compounds is more than mere nerdy curiosity: it is the key to releasing true creativity in the use of spices in cooking.

## SWEET WARMING PHENOLS

The warming, sweetly aromatic spices in this group owe their main flavor to compounds in the phenol family. Often strongly flavored and potent, many share aniseed and eucalyptus flavors, and sometimes bitterness.

### COMPOUND EXAMPLES

Eugenol in clove, anethole in fennel.

### IN THE KITCHEN

Often strong-tasting and persistent, with the flavor only slowly reduced with cooking. Mostly dissolve and disperse in oil.



## WARMING TERPENES

Terpenes are the broadest, most common type of flavor compounds. Spices in this group are dominated by warming terpenes, bringing warmth without strong sweetness. They tend to have woody, bitter, peppery, sometimes minty flavors.

### COMPOUND EXAMPLES

Sabinene in nutmeg and mace, germacrene in annatto.

### IN THE KITCHEN

Evaporate easily and are lost with prolonged cooking. Generally oil-soluble.



## FRAGRANT TERPENES

Spices whose flavor is mostly due to this group of terpenes share pleasantly fresh, pinelike or floral flavor compounds, sometimes with woody notes. In nature, the aromas of these compounds spread far and wide when released.

### COMPOUND EXAMPLES

Pinene in juniper, linalool in coriander.

### IN THE KITCHEN

Fast-acting and short-lived, generally not tolerating long cooking times. Disperse almost exclusively in oil or alcohol, rather than water.



## EARTHY TERPENES

With an earthy, dusty, even burnt flavor, these spices have an abundance of terpenes that convey woody spiciness. Serving in nature as poisons against pests, the compounds are not harmful to humans in small amounts.

### COMPOUND EXAMPLES

Cuminaldehyde in cumin, cymene in nigella.

### IN THE KITCHEN

Oil-soluble flavors are tenacious and lingering. Best combined with “lighter” fragrances.



## PENETRATING TERPENES

Unlike other terpene flavor groups, spices in this group are dominated by powerful terpene compounds that hit the back of the nose and linger on the palate, with usually camphorous, eucalyptus-like, often medicinal flavors.

### COMPOUND EXAMPLES

Fenchone in grains of Selim, cineole in cardamom.

### IN THE KITCHEN

Potent and lingering, these spices need to be used in moderation or toasted to mask with other flavors.



## CITRUS TERPENES

All these spices share compounds that we recognize as being like citrus fruit, giving them a tangy, refreshing, lemony flavor profile with some flowery and herbal aromas. They are found in many ripe fruits as well as spices.

### COMPOUND EXAMPLES

Citronellal in lemon myrtle, citral in lemongrass.

### IN THE KITCHEN

Fast-evaporating but found in high quantities in this group, so can withstand longer cooking times.





## Flavor groups

Using features shared by compounds, I have organized spices into 12 flavor groups. Their characteristics are described in the chart below, and we have translated the groupings into a Periodic Table of Spices on pp.14-15. Some elements of a spice's taste are not strictly flavor compounds because they cannot be sensed by the

nose and so have no aroma or flavor. These substances (technically termed “tastants”) act directly on the tongue, and include sugars and tart acids. Many are chemicals intended to deter predators—but which humans can enjoy—causing bitterness, numbness, coldness, or, in the case of pungent compounds, spicy heat.

### SWEET-SOUR ACIDS

The fruit-based spices in this flavor group are dominated by sourness from acids, and are typically accompanied by sweetness from plant sugars. Sometimes acids have an aroma, which can be like cheese or sweat.

#### COMPOUND EXAMPLES

Hexanoic and pentanoic acids in carob, citric acid in amchoor.

#### IN THE KITCHEN

Water-soluble and tolerant of long cooking. Suited to dishes containing sugar, which amplifies fruitiness and blunts strong sourness.



### FRUITY ALDEHYDES

Aldehyde compounds are found in abundance in fruiting plants and are more subtle on the palate than other flavor compound groups. Spices in this group carry a distinct fruity, malty, or fresh green flavor, sometimes with fatty or sweaty nuances.

#### COMPOUND EXAMPLES

Nonanal in sumac, hexanal in barberry.

#### IN THE KITCHEN

Partly water-soluble, but disperse best in oil and alcohol. Aromas do not survive high heats or long cooking times. Cook briefly or use raw to savor their subtleties.



### TOASTY PYRAZINES

These spices have been toasted as part of their processing or gain most of their flavor from being fried or toasted. Spices in this group carry nutty, roasted, caramel-like flavors, sometimes with smoky, meaty, fresh bread-like nuances.

#### COMPOUND EXAMPLES

Each spice develops a unique combination of dozens of pyrazines.

#### IN THE KITCHEN

Create pyrazines by dry-toasting spices over 266°F (130°C). Flavors spread best in oil and enhance savory dishes, in particular.



### SULFUROUS COMPOUNDS

Spices in this group tend to be dominated by oniony and meaty flavors, with cabbage- and horseradish-like nuances and a degree of pungency. In high concentrations, sulfur compounds can smell offensive and fetid.

#### COMPOUND EXAMPLES

Isothiocyanate in mustard, diallyl disulphide in garlic.

#### IN THE KITCHEN

Dispersing in fats, the meaty taste of these spices helps bring depth of flavor to vegetable dishes.



### PUNGENT COMPOUNDS

These sometimes alarmingly hot spices share compounds that are not flavors at all, but chemicals that create an illusion of burning by hijacking pain nerves that normally send warning signals to the brain above 108°F (42°C).

#### COMPOUND EXAMPLES

Capsaicin in chili, piperine in black pepper.

#### IN THE KITCHEN

Pungent compounds have varying strengths and agency, so combine spices for more rounded heat. Cook with fats to fully disperse the heat.



### UNIQUE COMPOUNDS

Some compounds are unique in the world of spices or do not fit in other groups. Spices dominated by such compounds can be earthy, mellow, penetrating, or herby, and usually partner with a wide range of other spices.

#### COMPOUND EXAMPLES

Picrocrocin and safranal in saffron, tumerone in turmeric.

#### IN THE KITCHEN

These spices possess characteristics usually not found elsewhere and will bring unique aromas to a dish.








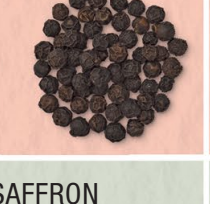


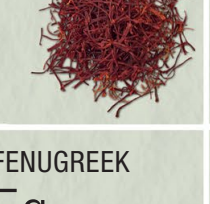















# PERIODIC TABLE OF SPICES

<p>PAPRIKA Pa</p> 	<p>SESAME Se</p> 	<p>SICHUAN PEPPER Si</p> 
<p>WATTLE Wa</p> 	<p>GRAINS OF PARADISE Pr</p> 	<p>GINGER Gi</p> 
<p>GARLIC Ga</p> 	<p>BLACK PEPPER Pe</p> 	<p>CHILI Ch</p> 
<p>ASAFETIDA As</p> 	<p>SAFFRON Sa</p> 	<p>POPPY Po</p> 
<p>CURRY LEAF Cy</p> 	<p>FENUGREEK Fg</p> 	<p>AJWAIN Aj</p> 
<p>MUSTARD Mu</p> 	<p>TURMERIC Tu</p> 	<p>CELERY SEED Ce</p> 

Taking inspiration from the scientific world, I have devised this Periodic Table of Spices as a starting point for a new way of thinking about spices.




Each of the main spices featured in this book has been assigned to one of 12 flavor groups, according to the flavor compound that is most important to its taste profile.

Use the key below to identify the flavor group and turn back to pp.12–13 for a full description of the characteristics defining each group.

Once you have familiarized yourself with the spice groupings, turn the page for step-by-step instructions on how to start using the Periodic Table of Spices to create your own pairings and unique blends.

## KEY TO FLAVOR GROUPS

Each group has been assigned a color and the Spice Profiles on pp.80–207 are ordered in their groups, with colored borders matching the colors of the Periodic Table to help with navigation.

	<b>Sweet Warming Phenols</b>		<b>Sweet-Sour Acids</b>
	<b>Warming Terpenes</b>		<b>Fruity Aldehydes</b>
	<b>Fragrant Terpenes</b>		<b>Toasty Pyrazines</b>
	<b>Earthy Terpenes</b>		<b>Sulfurous Compounds</b>
	<b>Penetrating Terpenes</b>		<b>Pungent Compounds</b>
	<b>Citrus Terpenes</b>		<b>Unique Compounds</b>



# CREATING SPICE PAIRINGS AND BLENDS

In most instances, spices work well together because they share one or more flavor compounds. In this book, the Periodic Table of Spices and blending science of each spice profile have been devised to help you understand spices through their flavor compounds. Below is a step-by-step guide for how to use this information to create your own unique spice mixes.

## Step 1

### CHOOSE MAIN FLAVOR GROUP(S)

Consider the flavor groups of the Periodic Table when choosing the main flavors of your dish. Do you want it to be spicy, fruity, earthy, zesty, or something else? You can have one or several main flavors, such as a zesty citrus dessert or a meat dish that's warming and smoky.



▲ *Sweet Warming Phenols*

▲ *Penetrating Terpenes*

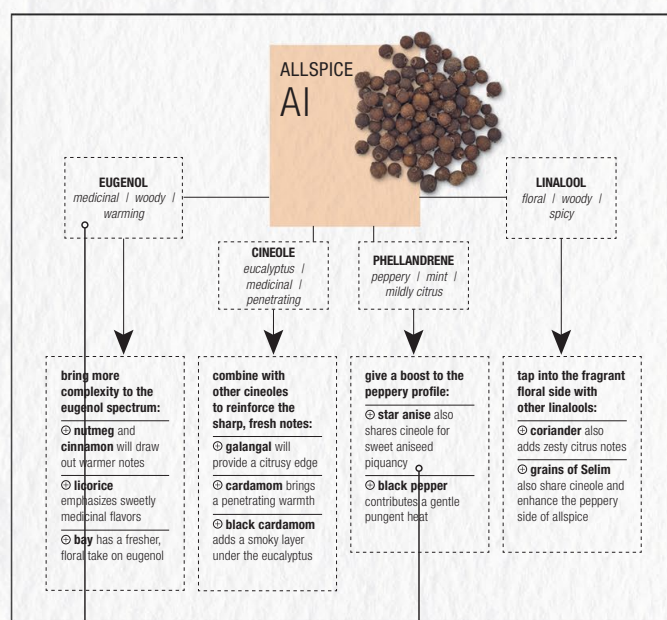
#### EXAMPLE

You may want to bring a strongly fragrant sweetness to a bean or lentil dish using spices in Sweet Warming Phenols, counterbalanced with an equally strong, but fresher, clean-tasting spice from Penetrating Terpenes. You will now be picking one or two spices from each of these groups to convey these key flavors.

## Step 2

### CHECK THE BLENDING SCIENCE

Read through the blending science in the relevant spice profiles to get to know the range of flavor compounds that each spice would bring to the dish. Try to make connections through shared compounds, especially between spices in different flavor groups; spices with no flavor compound link are more likely to clash.



**Main compounds**  
are listed with their  
flavor profile and  
other qualities

**Suggested pairings**  
link spices through each  
flavor compound, but  
are not exhaustive



“

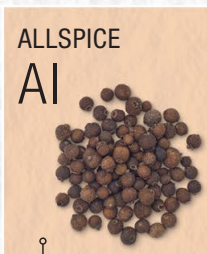
*Complexity increases with each extra spice, and so will pleasure—research shows that the greater the range of flavors and mouth sensations in a dish, the tastier it will be.*

”

### Step 3

#### PICK YOUR PRIMARY SPICES

Having reviewed the different flavor compounds in each spice, now settle on the specific spices that will convey the main flavors of the dish. Consider using two spices from the same flavor group to add depth and complexity: they will tend to blend well but bring different nuances for a more rounded base flavor.



**Eugenol** is the main compound and has a warm, medicinal flavor



**Anethole** has a licorice flavor and dominates star anise

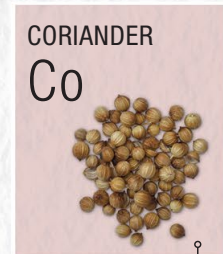
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**Cineole** is eucalyptus-like and vital to the taste of galangal



+



**Linalool** is the main compound in coriander and has a lilac aroma

#### EXAMPLE

Allspice and star anise link together powerfully because they belong to the same flavor group, bringing warmth and sweetness with aniseed overtones. These spices are a particularly great pair because they also share some minor compounds: peppery phellandrene and cineole. Galangal brings a new flavor dimension and since it also contains cineole, the trio harmonize together incredibly well.

### Step 4

#### ADD COMPLEXITY

Develop the blend by bringing in spices from further flavor groups, again selecting through shared flavor compounds. In addition to the spice profiles, use the table on pp.214–217 to explore the full range of main flavor compounds.

#### EXAMPLE

Coriander shares floral linalool with both allspice and star anise. This link helps coriander harmonize with the primary spices and will also reinforce their floral aspects that might otherwise be lost. Another connection is made through its camphene compound, which is related to the penetrating camphor in galangal.

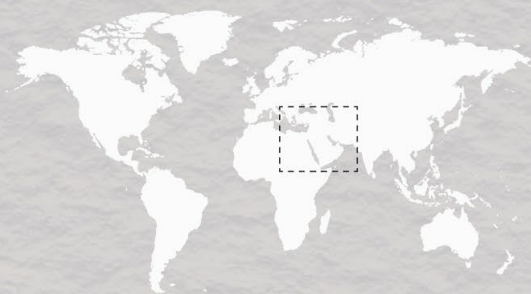




# *world of* | **SPICE**

*Explore the main regions of the spice world via ancient trade routes and modern-day maps, discover the key spices in each cuisine, and recreate signature blends.*













*World of Spice*

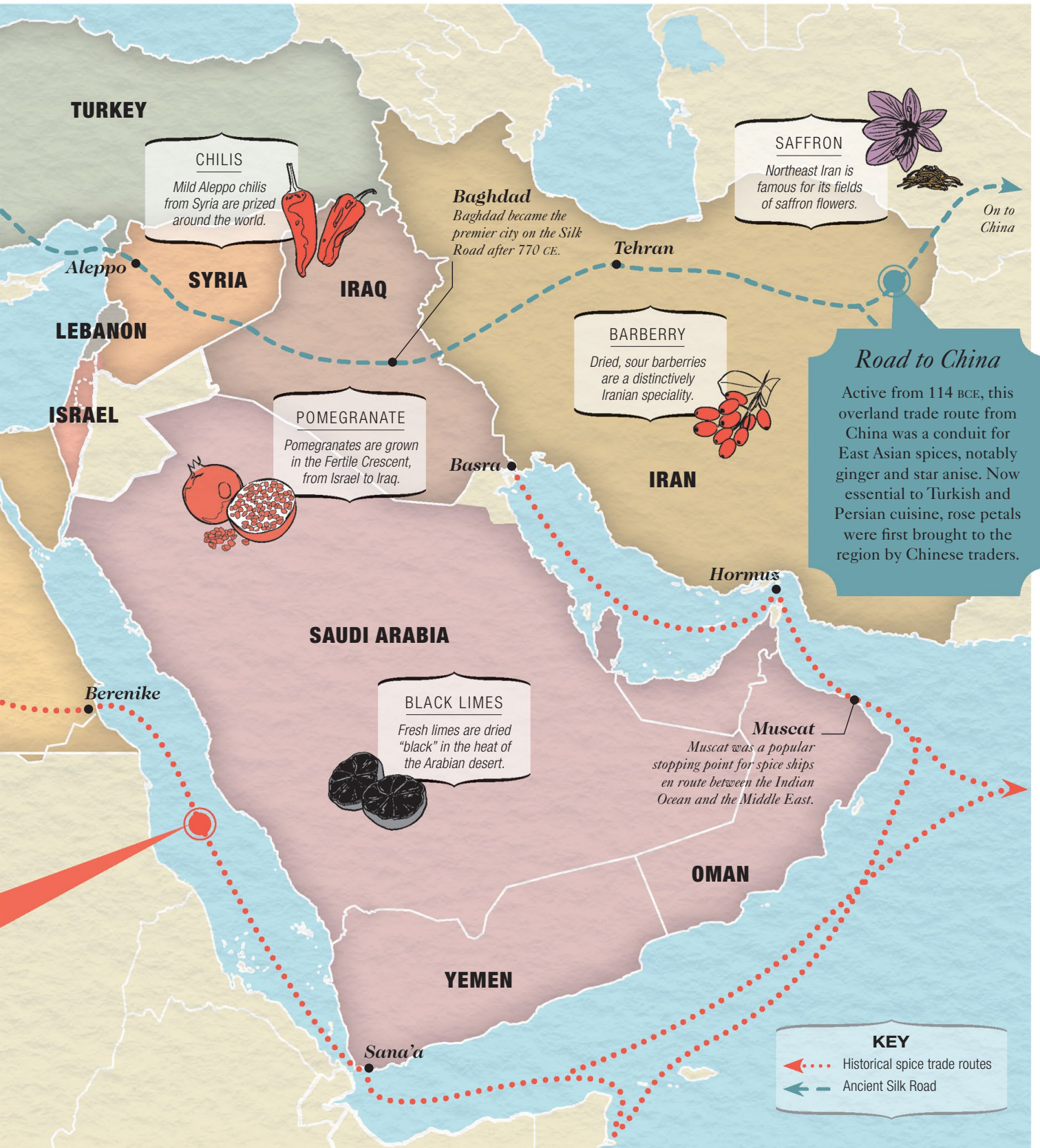
# MIDDLE EAST

The Middle East has been at the heart of the East–West spice trade for millennia. The spice palette is bright and green on the eastern shores of the Mediterranean, and drier and more intense across the deserts of Arabia, while Iran’s fertile lands brim with sweeter, fresher flavors.

SPICE REGIONS	
	<b>Turkey</b> p.23
	<b>Syria</b> p.22
	<b>Lebanon</b> p.25
	<b>Israel</b> p.24
	<b>Egypt</b> p.28
	<b>Iraq</b> p.26
	<b>Iran</b> p.27
	<b>Arabian Peninsula</b> p.29









## SPICE PALETTE



### Signature

**Aleppo pepper, sumac, allspice, black pepper, garlic**

The palette gets its mild, salty heat from the Aleppo pepper; a tang from its native sumac; and a mellow piquancy from allspice.

### Supporting

**Safflower, cumin, cinnamon, cardamom, nigella, sesame**

Syrians have a more sensitive taste for spice than the Turkish or Lebanese, choosing the milder safflower over saffron to flavor and color rice dishes.

### Supplementary

**Tamarind, nutmeg, caraway, anise**

Tamarind paste adds a sweet-sourness to the palette, while nutmeg, caraway, and anise are used to bring richness and licorice spice to cakes and desserts.

# SYRIA

*Fruity | Warm | Sour*

Often overlooked in favor of the cuisines of its better known neighbors, Turkey and Lebanon, it's a bitter irony that Syria's vibrant food culture is making a name for itself only as its people scatter from conflict in the area. The country has plenty to offer: a rich natural larder bursting with fresh herbs, cherries, dates, pomegranates, and nuts, laced with a fragrant and mild spice palette.

“

*Star of the Syrian spice rack is Aleppo pepper, a mild form of chili flakes produced around the ancient Silk Road town of Aleppo.*

”

## LOCAL SPICE BLEND

### Za'atar

This nutty, earthy blend of dried herbs and spices is a versatile seasoning for hummus, labneh, cheeses, meats, and fish.

- 2 tbsp** cumin seeds
- 1 tsp** sea salt
- 2 tbsp** sesame seeds
- 2 tbsp** dried oregano
- 2 tbsp** sumac

Dry-roast the cumin in a frying pan, over a low heat, until fragrant, then grind with the salt. Dry-roast the sesame seeds until golden and stir into the mixture with the oregano and sumac.

*Baharat—simply meaning “spices”—is the blend that defines the Middle East, its smoky mix varying from region to region.*

Lamb kofte with *baharat*, see p.210. ▶





## LOCAL SPICE BLEND

*Turkish baharat*

Use in meat kofte, pilafs, or with roast vegetables, especially eggplant.

**2 tbsp** black peppercorns

**2 tbsp** cumin seeds

**2 tbsp** coriander seeds

**1 tsp** cloves

**½ tbsp** cardamom seeds

**1 tbsp** ground nutmeg

**pinch** of ground cinnamon

**1 tbsp** dried spearmint

Finely grind the whole spices and combine with the remaining ingredients. Makes approximately 9 tablespoons.

**TURKEY**

*Fresh | Mild | Smoky*

At the crossroads of Europe, Asia, and the Middle East, Turkey has long been a hub for the trading of exotic spices. In the halls of Istanbul's domed Spice Bazaar, sacks of Iranian saffron and Sichuan pepper sit alongside Turkish specialities such as *pul biber*, a mild, coarsely ground chili used as a table condiment, or the darker, smokier *urfa biber*. Dishes from the Aegean and Mediterranean coast tend to use more fresh herbs and less spice than those from eastern areas, where heavier spicing and sweetness bring a more Middle Eastern flavor.

**SPICE PALETTE**

*urfa biber*



*cumin*

*Signature*

**Pul biber, black pepper, cumin, garlic, sumac**

Turkish spicing is surprisingly subtle, with dishes characterized by the mild heat of *pul biber* and black pepper.

*Supporting*

**Urfa biber, paprika, allspice, nigella, cinnamon**

Paprika, allspice, and *urfa biber* impart warmth and richness to meat dishes and soups, while cinnamon is added to sweet dishes, especially in eastern Turkey.

*Supplementary*

**Fenugreek, clove, nutmeg, coriander, cardamom**

Look closely, and you'll find spices from all over the world in Turkish cooking—Asian flavors are particularly common.





**SPICE  
PALETTE**



*paprika*



*sumac*

*Signature*

**Sesame, sumac, cumin, garlic, paprika**

If Israel's palette can be characterized by any blend of flavors, it's this Mediterranean-Middle Eastern flush of warm, sour, and spicy-sweet.

*Supporting*

**Caraway, chili, fenugreek, nigella, black pepper, cinnamon, cardamom, coriander**

Spices are particularly popular in Israel's famous breads: aniseedy caraway in Jewish rye bread, as well as nigella seeds in pittas.

*Supplementary*

**Turmeric, hibiscus, rose, saffron, bay**

The melting pot of flavors in Israeli cuisine is mirrored in its range of spices, some of which you won't find elsewhere in the Middle East, such as earthy-sweet dried hibiscus flowers.



**ISRAEL**

*Varied | Earthy | Sweet*

Although Israel shares much of its menu with neighboring Lebanon, the country draws its sprawling, ever-evolving spice palette from across the globe: fiery chili pastes from Yemen, paprika from Russia and eastern Europe, harissa from North Africa, and, increasingly, flavors from further afield thanks to Israeli travelers returning with Korean, Thai, and Mexican spice blends. The influx of fresh new flavors won't dampen Israel's devotion to its spice traditions, however: you'll still find its *zhug* green chili condiment served alongside falafel, grilled meats, sandwiches, soups, and egg dishes.

*Hibiscus flowers are steeped in water or ground to powder to release their sharp, cranberry-like fruitiness.*





◀ Sautéed squash and potatoes with poached egg and *zhug*.

#### LOCAL SPICE BLEND

### *Zhug*

This bright, intensely spicy chili paste is the national condiment of Israel.

- 1 tsp** cardamom seeds
- 1 tsp** coriander seeds
- 1 tsp** cumin seeds
- 2** green chilis, chopped
- 2** garlic cloves, chopped
- 1** large bunch cilantro, chopped
- 1** large bunch flat-leaf parsley, chopped
- 2 tbsp** olive oil
- salt and pepper, to taste
- juice of  $\frac{1}{2}$  lemon

Toast the dry spices in a frying pan over medium heat, then grind. Pound to a paste with the chilis and garlic. Combine with the herbs and 1 tbsp oil. Season and set aside for 10 minutes. Stir in the lemon juice and loosen with more olive oil.

## LEBANON

*Bright | Warm | Aniseedy*

The Middle East's most famous export, traditional Lebanese mezze, can be found across the Levantine region, often resulting in fierce disputes over origin: hummus, for example, is steadfastly claimed by both Israel and Lebanon. The country's cooks deploy spices liberally, whether on their own or in the ubiquitous seven-spice *baharat*, a staple in every kitchen for use in mezzes, marinades, soups, and stews.

“

*This volatile heartland of the eastern Mediterranean punches way above its weight in its spectrum of spices.*

”

#### LOCAL SPICE BLEND

### *Taklia*

A versatile, savory blend usually added to soups and stews just before serving.

- 3** cloves garlic, peeled and sliced
- 2 tbsp** olive oil
- 1 tsp** ground coriander
- a good **pinch** of cayenne
- $\frac{1}{2}$  tsp sea salt

Fry the garlic gently in the oil, then when it is fragrant but not colored, pour it into a mortar with the coriander, cayenne, and salt, and grind to a paste.

#### SPICE PALETTE



#### *Signature*

**Coriander, cinnamon, black pepper, allspice, clove, ginger, nutmeg**

A *baharat* blend of these seven spices is used to flavor beef and lamb dishes, such as *kibbeh* beef croquettes, *kafta* skewers, and stuffed vegetables.

#### *Supporting*

**Garlic, sumac, paprika, cumin, cardamom, sesame, fenugreek**

Lebanon's spectrum of warm, nutty, earthy, and sour spices adds depth to meats and salads. Cardamom brings a distinctive sweetness to tea and sweets.

#### *Supplementary*

**Saffron, turmeric, caraway, anise**

The sweet-toothed Lebanese are particularly fond of dishes spiced with aniseed flavors; *meghli* rice pudding or *sfouf* tea cake are especially popular.



**SPICE  
PALETTE***cardamom**cinnamon**Signature***Black pepper, cardamom, cinnamon, cumin**

Black pepper is the preferred seasoning and the other rich, warm spices are paired with lamb, Iraq's favorite meat, in kebabs and stews.

*Supporting***Allspice, garlic, turmeric, tamarind, saffron, dried lime**

Sour flavors play an important role in Iraqi spicing: tamarind and turmeric, for example, characterize the traditional dish of *masguf* (grilled carp).

*Supplementary***Fenugreek, cassia, paprika, coriander, ginger**

Additional spices are drawn from across the globe, with influences creeping in from Latin America, China, Southeast Asia, and India.

**IRAQ***Sweet | Fragrant | Sour*

Spices have been woven throughout Iraq's rich history and were first cultivated by the rulers of ancient Mesopotamia. The palette was enlivened by the fresh, fruity spices of the Persians, and further added to by traders on the Silk Road and Spice Route, who brought the sweet-and-sour flavors of Chinese cassia and the heady cardamom, turmeric, and fenugreek of South Asia.

“

*Spices are so central to Iraqi home cooking that families have their own unique baharat blended for them at the local market.*

”

**LOCAL SPICE BLEND***Arabic baharat*

This Iraqi version of the regional blend is sweet and fragrant, and can be used as an all-purpose rub, marinade, or seasoning.

- 1 tbsp** black peppercorns
- 1 tbsp** allspice
- 1 tsp** cloves
- 1 tsp** coriander seeds
- 1 tsp** cumin seeds
- 1 tbsp** cinnamon
- 1 tsp** grated nutmeg

Grind the whole spices and combine with the cinnamon and cumin.

*Saffron is the most expensive spice in the world, and Iran is responsible for over 90 percent of its production.*

Persian rice pudding with *advieh*, see p.210. ▶





## LOCAL SPICE BLEND

*Advieh*

A heady blend of Persian spices to sprinkle over savory rice, rub over meats, or add to stews. It is good on Persian rice pudding, too.

- 2 tbsp** dried rose petals
- 2 tbsp** cardamom seeds
- 1 tbsp** cumin seeds
- 2 tbsp** ground cinnamon
- 2 tbsp** ground ginger

Grind the whole spices and combine with the cinnamon and ginger.

**IRAN**

*Floral | Musky | Sour*

Iran's spice palette and cuisine are as rich and exciting as its history. In this sprawling intersection between east and west—the center of the Persian Empire and the Silk Road, invaded by Greeks, Arabs, Turks, Mongols, and Uzbeks—you'll find caviar and Chinese noodles, smoked fish and hot-and-sour prawns, and a natural larder brimming with pistachios, pomegranates, mint, walnuts, and the prized Iranian saffron, grown in the northeast. Stews and pilafs are underpinned by Iran's sweet-and-sour spices—sumac, dried limes, barberries, and tamarind—while fragrant rose petals give spice mixes and sweets a hint of the exotic.

**SPICE PALETTE***saffron**rose**Signature***Saffron, sumac, rose**

Iran's famous burnt-red saffron strands—never powder—give seafood and poultry a rich, slightly bitter flavor and rice dishes their vibrant amber color.

*Supporting***Dried lime, barberry, angelica, cinnamon, cumin, ginger, turmeric, garlic**

Iranian cuisine owes its fruity tang to its dried fruits and sour, citrusy spices, with a rich baseline of fragrant and earthy cinnamon, cumin, and ginger. Turmeric is used to color and add a musky depth to savory dishes.

*Supplementary***Fenugreek leaves, curry powder, paprika, tamarind**

The subtle bitterness and warmth of fenugreek leaves and drier spices balance the sweetness and sour flavors of Iran's fresh ingredients.





**SPICE  
PALETTE***cumin**cinnamon**Signature***Cumin, cinnamon**

The go-to spice for savory dishes is cumin, while cinnamon is used just as liberally to add depth to Egypt's array of sweet dishes.

*Supporting***Garlic, black pepper, chili, coriander**

Tomato sauces are perked up with a fresh palette of garlic, black pepper, and chili flakes, while coriander provides a mellow, citrusy partner to cumin.

*Supplementary***Ginger, cloves, bay, cardamom, allspice**

You will often find an additional spice or two to partner the main flavor, but Egyptians keep their spicing relatively simple, or reach for the *baharat*.

**EGYPT***Fresh | Earthy | Nutty*

Flanked by the Red Sea and the Mediterranean, Egypt's ports became the gateway to the riches of the East long before its mercantile heyday in the Middle Ages. Despite its spice-rich history, the modern Egyptian palette is simpler than that of other Levantine countries. Indigenous cumin is the prevailing flavor—its rich, nutty notes enliven the relatively humble ingredients of Egypt's vegetable soups, meat stews, and grain dishes such as *koshari*. Cumin, along with hazelnuts, sesame seeds, and coriander, is also a key flavoring in *dukkah*, a distinctively Egyptian condiment that varies in content from house to house.

## LOCAL SPICE BLEND

*Dukkah*

An everyday blend of spices and nuts that is often served with olive oil and bread or used to season roasted meats or hummus.

**5½oz (150g)** hazelnuts**5½oz (150g)** whole almonds**1 tbsp** coriander seeds**1 tbsp** cumin seeds**3 tbsp** sesame seeds**pinch** of salt

Preheat the oven to 400°F (200°C). Spread the nuts on separate baking sheets. Roast the almonds for 8 minutes and the hazelnuts for 10 minutes, shaking the trays every 3 minutes. Toast the seeds over a high heat for 3 minutes, tossing constantly. Grind together the cooled nuts, seeds, and salt.





▲ Hummus and flatbreads served with *dukkah*.

*Ancient Egyptians founded the spice trade, importing spices from Africa and Arabia as early as 3000 BCE.*

## ARABIAN PENINSULA

*Rich | Dry | Musky*

The Arabian spice palette shares many of its rich, fragrant flavors with its northern neighbors: the Levantine trinity of cumin, coriander, and cinnamon, as well as dried limes and saffron from Iran. But as the Arabian peninsula stretches down to Yemen and Oman, with Africa and Asia beyond, the flavors and heat of its food intensify with the climate and terrain. In come cloves and black pepper, masala mixes, turmeric and coconut dishes from Asia, and hot chilis from Africa.

“

*Omani and Yemeni cuisines are justifiably famous for their heady blend of fiery flavors.*

”

### LOCAL SPICE BLEND

#### *Hawaij*

A currylike Yemeni blend, popular in slow-cooked meat dishes and soups and as a spice rub. A sweeter version replaces the pepper and cumin with ginger, cloves, cinnamon, or fennel, and is added to coffee and desserts.

- 1 **tblsp** black peppercorns
- 7 **tsp** cumin seeds
- 1 **tblsp** cardamom seeds
- 1 **tblsp** coriander seeds
- 2 **tblsp** ground turmeric

Grind the whole spices and combine with the turmeric.

### SPICE PALETTE



*dried lime*



*bay*

#### *Signature*

##### **Baharat, dried lime, bay**

The signature flavors of Arab *baharat*, dried limes, and bay leaves give slow-cooked dishes and spice mixes a distinctive sour, musky flavor.

#### *Supporting*

##### **Saffron, cardamom, clove, cinnamon, cumin, coriander, garlic, chili, black pepper**

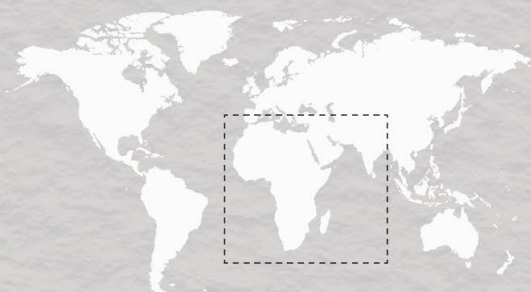
Lamb and rice dishes are a firm fixture on Saudi menus, and the palette is full of piquant, citrusy spices that cut through the richness of the meat.

#### *Supplementary*

##### **Turmeric, nutmeg, caraway**

Sweet and slightly bitter, turmeric gives a brightness to the flavor and color of Yemeni spice blends and Omani fish soups.











*World of Spice*

# AFRICA

Africa's cuisine is as diverse as the land is vast. From Casablanca to the tip of the Cape, you will find spices that tell a complex story: of kingdoms and empires, of overland and maritime spice routes, of slave trades, of European colonization, and of migration within Africa.

SPICE REGIONS	
	<i>The Maghreb</i> p.33
	<i>West Africa</i> p.36
	<i>Central Africa</i> p.35
	<i>The Horn of Africa</i> p.32
	<i>East Africa</i> p.34
	<i>Southern Africa</i> p.37

**Lisbon**

**Casablanca**

**Marrakesh**

**ALGERIA**

**Ain Salah**  
*In the heart of the desert, this city was a stopping point on many trans-Saharan routes.*

**Timbuktu**  
*For centuries this ancient city was a hub for trade in spices, salt, gold—and slaves.*

**IVORY COAST**

**GHANA**

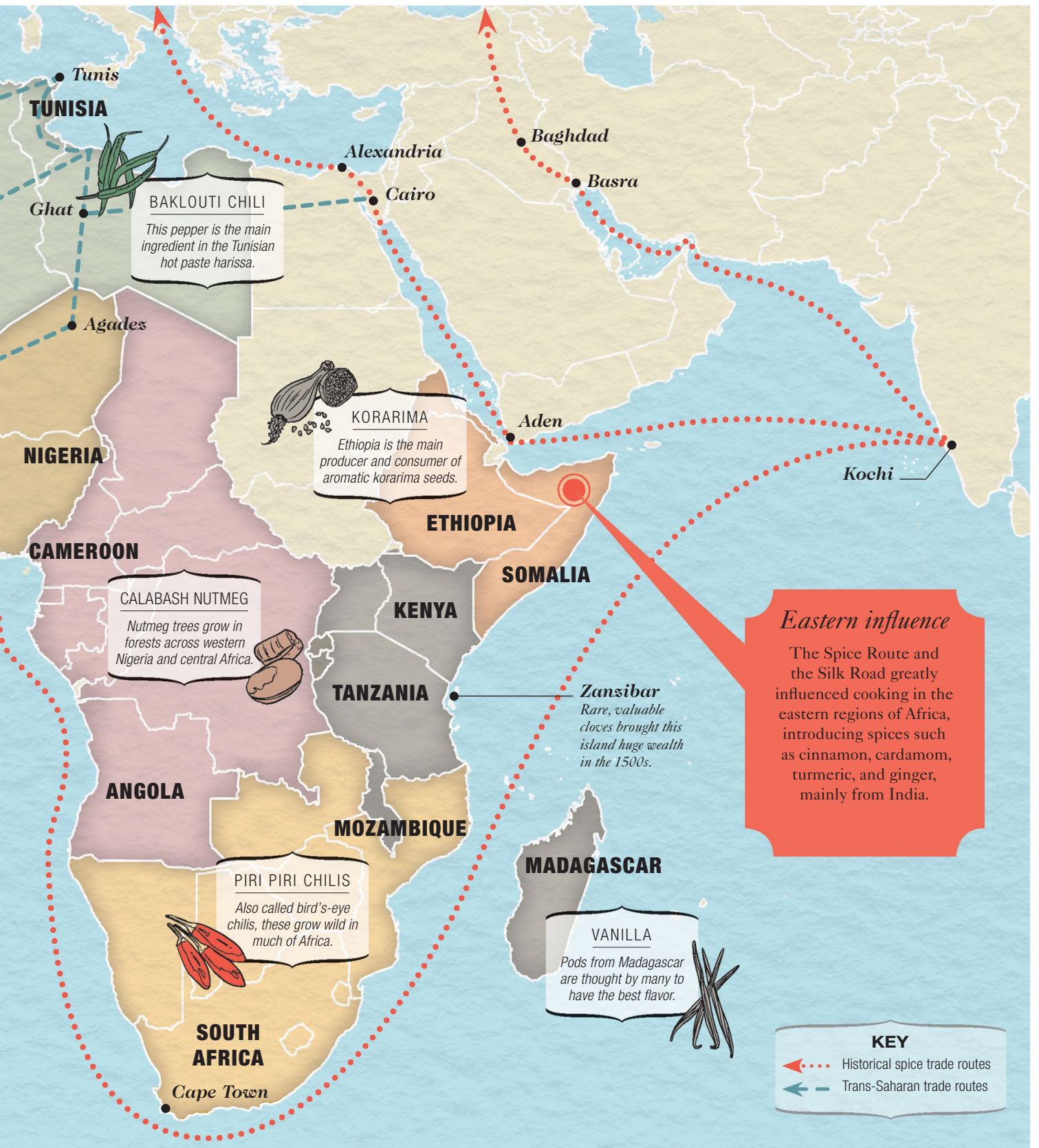
**Elmina**

**GRAINS OF SELIM**  
*This musky spice, found throughout West Africa, is rare elsewhere.*

**GRAINS OF PARADISE**  
*This spice led the coast of West Africa to be known as the Grain Coast.*

**Across the desert**  
From ancient times, merchants found routes across the Sahara to take African spices, such as grains of paradise, to North Africa and Europe beyond. Goods were transported by camels in huge convoys known as caravans.





**BAKLOUTI CHILI**  
 This pepper is the main ingredient in the Tunisian hot paste harissa.

**KORARIMA**  
 Ethiopia is the main producer and consumer of aromatic korarima seeds.

**CALABASH NUTMEG**  
 Nutmeg trees grow in forests across western Nigeria and central Africa.

**PIRI PIRI CHILIS**  
 Also called bird's-eye chilis, these grow wild in much of Africa.

**VANILLA**  
 Pods from Madagascar are thought by many to have the best flavor.

**Eastern influence**  
 The Spice Route and the Silk Road greatly influenced cooking in the eastern regions of Africa, introducing spices such as cinnamon, cardamom, turmeric, and ginger, mainly from India.

**KEY**  
 - - - - - Historical spice trade routes  
 - - - - - Trans-Saharan trade routes



## SPICE PALETTE



fenugreek



cardamom

### Signature

**Korarima, fenugreek, chili pepper, cardamom, cumin, coriander**

Also called false or Ethiopian cardamom, *korarima* is native to Ethiopia and has a similar but milder flavor to true cardamom. The spice is notably used to flavor *kiffo*, a type of steak tartare dish.

### Supporting

**Turmeric, ginger, garlic, nigella, clove**

Cloves added to the hottest chilis, cardamom or *korarima*, and salt comprise the *mitmita* spice blend. Other supporting spices help to flavor the many interesting vegetable sides and relishes of the region.

### Supplementary

**Cinnamon, nutmeg, ajwain, timiz**

Before the chili pepper arrived, the local species of long pepper (*Piper capense*), known as *timiz*, provided the main source of pungent heat.

# THE HORN OF AFRICA

*Fiery | Aromatic | Smoky*

Ethiopia's capital, Addis Ababa, is home to Africa's largest spice market—a sign of this region's spice diversity. The ubiquitous *berbere* mix and its less complex sister blend *mitmita*, both shared by Ethiopia and Eritrea, are dominated by red hot piri piri chilis. Yet the quintessential taste of Ethiopian cooking comes from bittersweet fenugreek and smoky floral *korarima*. Somali cuisine, meanwhile, is defined by the fruitiness of coriander, cleanness of cardamom, and earthiness of cumin.

“

*Spices are among the few external influences brought to bear on the unique flavors of Ethiopian cooking.*

”

## LOCAL SPICE BLEND

### *Niter kibbeh*

This spiced clarified butter is used as the flavorful base fat for many regional dishes, including hearty *wat* meat stews.

<b>1 lb 2oz (500g)</b> unsalted butter	<b>1 tsp</b> ground cumin seeds
<b>1</b> medium onion, finely chopped	<b>1 tsp</b> <i>korarima</i> or cardamom seeds
<b>2</b> garlic cloves, finely chopped	<b>½ tsp</b> turmeric powder
<b>1 tbsp</b> grated fresh root ginger	<b>1 tsp</b> dried oregano
<b>1 tsp</b> fenugreek seeds	<b>6</b> basil leaves
	<b>4</b> sage leaves

Melt the butter in a pan over medium-low heat. Add the remaining ingredients and cook, stirring, for 20 minutes. Strain through muslin into a sterilized jar.

*Saffron is a top export of Morocco, but is only seldom cooked with locally, mainly due to French influence.*

Harissa served as a dip with flatbreads. ➤





## LOCAL SPICE BLEND

*Harissa*

Harissa paste is used as a condiment, a dip for bread, or as the main flavoring for stews and sauces.

**3½ oz (100 g)** dried red chilis, Baklouti if you can get them, or other moderately hot chilis, such as Kashmiri

**3 or 4** large cloves of garlic

**1 tsp** salt

**1–2 tbsp** lemon juice

**½ tsp** cumin seeds, ground

**½ tsp** coriander seeds, ground

**½ tsp** caraway seeds, ground

**1 tbsp** olive oil

Seed the chilis and soak in hot water for 30 minutes. Drain, combine with the other ingredients, and pound or blend to a paste.

**THE MAGHREB***Earthy | Rich | Mild*

The collective of countries known as the Maghreb is the portal where Africa meets the Middle East and Europe. The region's cuisine has been shaped by cultural exchange between indigenous Berbers and their conquerors through the centuries—Arabs, Ottomans, and French—as well as from the period when Islamic Berbers themselves ruled most of the Iberian peninsula as Al-Andalus. Spicing is sweet and mild for the most part, with cumin the everyday choice, and cinnamon bringing its aromatic notes to rich, fruit-laden tagines. The chili heat of Tunisia's harissa paste is a sweat-inducing exception.

**SPICE PALETTE***cumin**Paprika**Signature***Cumin, cinnamon, ginger, chili**

Cumin gives the dishes of the Maghreb their mild and earthy undertones, while cinnamon and ginger add an aromatic edge to tagines, soups, and stews.

*Supporting***Coriander, turmeric, clove, paprika, allspice**

Arab traders introduced further exotic spices from the East—coriander, turmeric, and cloves—and in the other direction, paprika and allspice were introduced from the Americas.

*Supplementary***Pepper, nutmeg, cardamom, fenugreek**

These lesser spices tend not to feature on their own and are more usually encountered in the blend *ras el hanout*, a broad combination of spices with local variations that brings together most, if not all, of the above palette of spices.





**SPICE  
PALETTE***cardamom**coriander**bay**Signature***Ginger, cardamom,  
garlic, cinnamon, clove**

Ginger gives East African cuisine piquancy and heat. Kenyan and Ugandan dishes are fairly mild, but ginger is used liberally. Cardamom, clove, and cinnamon add their sweet aromas to the local version of chai tea.

*Supporting***Bay, black pepper,  
cumin, coriander**

Pepper and cumin bring heat and earthiness to various blends. Bay and coriander are added to meaty versions of pilau, alongside the standard masala.

*Supplementary***Tsiperifery, turmeric,  
chili, sesame**

*Tsiperifery* is a variety of pepper native to Madagascar, more pungent and citrusy than ordinary black pepper. Crushed sesame features in Ugandan cooking, often paired with spinach.



Spices for an East African pilau masala blend. ➤

**EAST AFRICA***Zingy | Sweet | Fragrant*

Thanks to the legendary spice islands of the Zanzibar Archipelago, Tanzania has historically been the epicenter of East Africa's spice trade and continues to play the role of dominant influencer in the region's cuisine. Over 2,000 years of trade with Arabia, Persia, and India saw the introduction of warming spices such as cloves, ginger, pepper, cinnamon, and cardamom. Ginger and cardamom traveled farthest inland, making them the most widely used spices of the region. In coastal areas, cooking draws on turmeric and coriander to bring fresh, tropical notes when combined with coconut.

## LOCAL SPICE BLEND

*Pilau masala*

Introduced to the region via India and Arabia, pilau rice is a one-pot dish made with meat or vegetables and spiced with the following masala blend.

- ½ **tsp** cumin seeds
- ½ **tsp** whole black peppercorns
- ½ **tsp** cloves
- ¼ **tsp** cardamom seeds
- ¼ **tsp** ground cinnamon

Grind the whole spices and combine with the cinnamon. The masala is usually added when frying the onions.



## CENTRAL AFRICA

*Nutty | Pungent | Local*

With the exception of chilis introduced in the 15th century by Portuguese explorers, the cuisine of Central Africa has remained true to its indigenous spice cupboard. Seeds and bark of the *bobimbi* tree are the region's equivalent to garlic, used in almost every local dish, and three native pungent spices provide lingering heat and hints of citrus: Ashanti pepper (*Piper guineense*), grains of Selim, and *mbongo* (*Aframomum citratum*).

“

*Confusingly, ‘grains of paradise’ is a name applied locally to four different spices: Ashanti, mbongo, grains of Selim, and grains of paradise!*

”

### LOCAL SPICE BLEND

#### *Mbongo mix*

Use to flavor Cameroonian “black stew” *mbongo tchobi*, most often made with white fish.

- 4 tsp ground *mbongo* or black cardamom
- 1 tsp *bobimbi* or 1 handful wild garlic or garlic chives
- 30 *njangsa* seeds or 1 handful unsalted peanuts
- 2 calabash nutmeg seeds or 1 tsp grated nutmeg
- 1 tsp grains of paradise
- 4 garlic cloves
- 1 onion, roughly chopped

Grind the whole spices, combine with the garlic and onion in a blender, add 4 tbsp water, and process until smooth.

### SPICE PALETTE



*Scotch bonnet chili*



*ginger*

#### *Signature*

##### **Bobimbi, njangsa, mbongo**

*Njangsa* are the oil-rich seeds of the *Ricinodendron* tree, bringing a nutty flavor and thickening property to dishes, with a particular affinity for fish.

#### *Supporting*

##### **Calabash nutmeg (*Monodora myristica*), chili (Scotch bonnet), ginger, grains of paradise**

Milder than ordinary nutmeg, indigenous calabash nutmeg found its way to the Caribbean—where it is called Jamaican nutmeg—via the European slave trade. Ginger, chili, and grains of paradise are regular additions to soups.

#### *Supplementary*

##### **Garlic, bay, black pepper, curry powder**

The region is gradually embracing non-native spices, with garlic, pepper, and bay leaf used to season local versions of the jollof rice dish, and curry powder employed as a flavor shortcut in Cameroonian curries.

*Zanzibar was once the world's largest producer of cloves, a trade established by Omani settlers to the island.*



## SPICE PALETTE



grains of Selim



grains of paradise

### Signature

#### Chili, ginger, garlic

Most savory dishes begin with these backbone spices, almost always used together. Chilis tend to be at the hot end of the scale, used fresh, dried, or powdered.

### Supporting

#### Grains of Selim, grains of paradise, iru, prekese, nutmeg, bay

Grains of Selim and grains of paradise both bring pepperiness. *Prekese* are the sweetly fragrant pods of a pealike plant, also known as “soup perfume.” *Iru* are the fermented seeds of the locust bean tree, with a strong ammonia smell, used as a condiment.

### Supplementary

#### Turmeric, Ashanti pepper, clove, anise

Ashanti pepper (see p.35) is most important in soups, notably *banga* (palm nut), peanut, or pepper soups. Clove-spiced sour millet porridge is a popular breakfast dish in Accra.

## WEST AFRICA

*Hot | Pungent | Smoky*

West Africa is a region of diverse landscapes and peoples, and equally varied culinary traditions. It can, however, be useful to consider the cuisine divided according to its two major language groups: French and English. In Francophone countries, the use of mustard paste and souring agents such as vinegar or lemon juice is widespread, notably in the popular chicken dish *poulet yassa*. Anglophone countries, by contrast, bring intense depth of flavor to dishes through smoked, fermented, and dried ingredients, peppering up almost any savory dish with dried or smoked and ground crayfish, or fermented locust beans.

“

*Originally from Senegal, the spicy rice dish jollof is raising the profile of West African cuisine across the world.*

”

### LOCAL SPICE BLEND

#### Yaji

This is the spice mix used to marinate the meat for *suya*, West Africa’s street food kebabs.

- |   |                                     |
|---|-------------------------------------|
| <b>10</b> strands of grains of Selim                                    | <b>5 tbsp</b> ginger powder         |
| <b>1 tbsp</b> whole Ashanti pepper                                      | <b>2 tbsp</b> cayenne pepper flakes |
| <b>5 tbsp</b> crushed <i>kuli-kuli</i> or peanut puffs, e.g. Osem Bamba | <b>1</b> dry stock cube, crumbled   |
|   | <b>½ tsp</b> salt                   |
|   | black pepper, to taste              |

Break up the grains of Selim and grind with the Ashanti pepper; you may need to sift out any fibers. Combine with the remaining ingredients and mix well.

*Durban is known as the biggest Indian city outside India, and Victoria Street Market is famed for its spices.*

Beef bunny chow made with Durban curry masala, see p.211. ➤





## LOCAL SPICE BLEND

*Durban curry masala*

This blend from South Africa's third city is characterized by bold heat with a touch of sweetness.

- 2 tsp** coriander seeds
- 2 tsp** cumin seeds
- 1 tsp** cardamom seeds
- ½ tsp** fenugreek seeds
- 2** cloves
- 2 in (5 cm)** cinnamon stick
- 6 tsp** mild chili powder
- 1 tsp** cayenne pepper
- ½ tsp** ground ginger

Toast the whole spices in a frying pan over medium heat until fragrant, then grind and combine with the remaining spices.

**SOUTHERN AFRICA***Hot | Sweet | Diverse*

If South Africa is known as the Rainbow Nation, the country's cuisine encompasses a similarly broad diversity of spices, largely determined by the colonial past. Early Dutch colonization has left a legacy of Indonesian-influenced spicing in Cape Malay dishes, while the influx of Indian laborers under British rule makes Durban a contender for the premier curry city in the world. Mozambique is the fiery quarter of Southern Africa with its Portuguese-influenced piri piri chili blends. By contrast, flavors within landlocked Botswana and Zimbabwe are much milder, with spices used carefully and sparingly.

**SPICE PALETTE***Signature***Cinnamon, turmeric, coriander, chili, garlic**

Regional cooks don't hold back if chili is called for, but turmeric is often used for a milder currylike flavor. Cinnamon enlivens the Dutch-derived custard dessert *melktert*, and coriander adds fruitiness to *biltong*, a dry-cured meat.

*Secondary***Clove, black pepper, cumin, ginger, cardamom, bay**

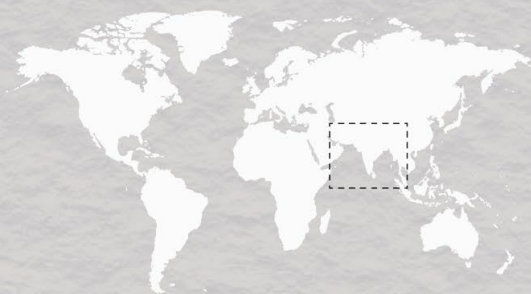
Further combinations of Asian spices produce a variety of Indonesian- or Indian-inspired masala blends, while bay leaf flavors the savory custard topping of *bobotie*, South Africa's national dish.

*Supporting***Nutmeg, anise, allspice**

These three sweet, fragrant spices are sometimes used alongside coriander in regional variations of *biltong*.













## *World of Spice*

# SOUTH ASIA

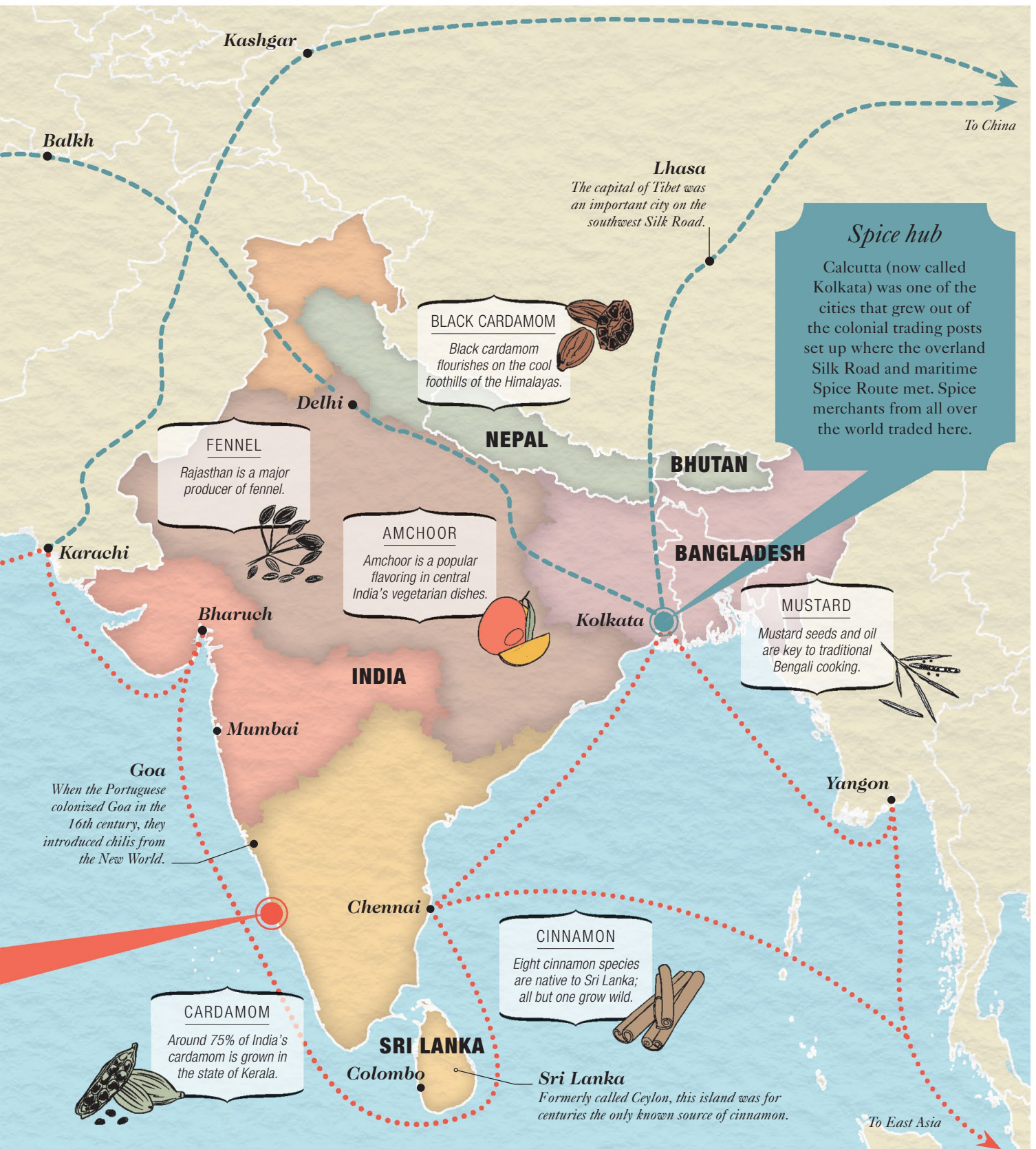
Each of South Asia's diverse communities has its own distinctive seasonings, from a simple sprinkle of cumin to complex spice blends. Native spices, such as cardamom and cinnamon, are central to many cuisines, while chili and coriander, once non-local, are now valuable exports.

### SPICE REGIONS

	<b>North India</b> p.40
	<b>Himalayan Belt</b> p.41
	<b>Central India</b> p.42
	<b>West India</b> p.44
	<b>East India and Bangladesh</b> p.43
	<b>South India and Sri Lanka</b> p.45







Kashgar

Balkh

To China

Lhasa

The capital of Tibet was an important city on the southwest Silk Road.

*Spice hub*

Calcutta (now called Kolkata) was one of the cities that grew out of the colonial trading posts set up where the overland Silk Road and maritime Spice Route met. Spice merchants from all over the world traded here.

**BLACK CARDAMOM**

Black cardamom flourishes on the cool foothills of the Himalayas.



Delhi

NEPAL

BHUTAN

**FENNEL**

Rajasthan is a major producer of fennel.



**AMCHOOR**

Amchoor is a popular flavoring in central India's vegetarian dishes.



BANGLADESH

Kolkata

**MUSTARD**

Mustard seeds and oil are key to traditional Bengali cooking.



Karachi

Bharuch

INDIA

Mumbai

Goa

When the Portuguese colonized Goa in the 16th century, they introduced chilis from the New World.

Yangon

Chennai

**CINNAMON**

Eight cinnamon species are native to Sri Lanka; all but one grow wild.



**CARDAMOM**

Around 75% of India's cardamom is grown in the state of Kerala.



SRI LANKA

Colombo

Sri Lanka

Formerly called Ceylon, this island was for centuries the only known source of cinnamon.

To East Asia



**SPICE  
PALETTE**

turmeric



chili



cumin

*Signature***Cumin, turmeric, chili,  
ginger, garlic**

The foundation of essential masala mixes and pastes, these versatile spices are often used together and provide an obliging base for main ingredients.

*Supporting***Cassia, clove, cardamom,  
Indian bay, fennel**

These sweet spices bring warmth and fragrance. Indian bay is from the same family as cinnamon, and tastes like a mix of cloves, cinnamon, and allspice.

*Supplementary***Black cumin, anardana,  
peppercorn, saffron**

Smoky, tart, warming, and sweet, these spices grab the senses with their distinctive personalities, and perform well as solo seasonings or as part of a blend.



Chickpea curry  
spiced with  
garam masala,  
see p.211. ►

**NORTH INDIA***Complex | Earthy | Fragrant*

From no-frills rustic cooking in Punjabi homes, to the refined flavors of Mughal palace kitchens, and kebabs and hearty dhals finished with sizzling cumin at roadside cafés, this food is as widely traveled as the spices that have earned it such international acclaim. During the heyday of princely Maharajas and Nawabs, royal chefs created flamboyant spice blends for sophisticated dishes, many of which featured a dozen or more aromatic seasonings. Home cooks also draw on a versatile spice box, preferring the warming nature of garam masalas over brute chili heat.

## LOCAL SPICE BLEND

*Garam masala*

Many households have their own variation of this warming spice blend, which is used in the same way as you would a seasoning.

**scant 1 oz (25 g)** black  
cardamom seeds

**scant 1 oz (25 g)** cassia,  
broken into pieces

**scant 1 oz (25 g)** black peppercorns

**¼oz (10 g)** black cumin seeds

**2** blades mace

**¼oz (10 g)** cloves

**⅓** nutmeg, chopped

Grind all the spices to a fine powder  
and sift to remove any fibers.



## HIMALAYAN BELT

*Astringent | Fiery | Warming*

Cooking in the Himalayas is shaped by nature's harvest in the foothills along with frugal high-altitude pickings. There's an emphasis on wholesome pulses, often finished with a *tarka* of warming fried cumin seeds, chilis, and ginger. Spices tend to be basic, and in areas such as Bhutan, chilis are elevated to a main ingredient. Ginger-spiced steamed dumplings, chili-laden Tibetan broths, and Chinese noodles coexist with such Punjabi staples as parathas, naans, and homely dhals.

“

*Longevity of food is of primary focus, and spiced pickles and preserves perk up meals during the cold winter months.*

”

### LOCAL SPICE BLEND

#### *Timur ko chhop*

The Himalayan equivalent of salt and pepper: use as a seasoning for soups, a dip for fried meats, or as a fiery pick-me-up over fried potatoes, noodles, and curries.

**1 tsp** *timur* or Sichuan pepper

**2 tbsp** red chili powder

**1 tsp** salt

Dry-roast the *timur* in a frying pan, over low heat, until fragrant, stirring all the time. Mix with the chili and salt, and grind to a powder.

### SPICE PALETTE



*Fenugreek*



*timur*

#### *Signature*

**Fenugreek, chili, timur, ginger, garlic**

The bitterness of fenugreek seeds contrasts with the nuttiness of lentils and pulses, while *timur* (a type of Sichuan pepper) lends a more citrusy, but still astringent flavor to Nepali masalas.

#### *Supporting*

**Black cardamom, asafetida, turmeric**

Asafetida's sulfurous aroma is softened to mellow sweetness after cooking, which complements the earthiness of smoky black cardamom and turmeric.

#### *Supplementary*

**Coriander, ajwain, clove, cumin**

Ajwain seeds and cloves have robust and bitter flavors to enliven everyday meals, along with more discreet coriander and cumin.

*Black cumin—or shahi jeera—is from a different but related plant to regular cumin and has a slightly smoky flavor.*



## SPICE PALETTE



coriander



dried red chilis

### Signature

**Coriander, cumin, dried red chilis, turmeric, ginger**

The key spices of central India provide depth of flavor and richness to everyday vegetables, lentils, and pulses, and although they are used across South Asia, their versatility is very much center stage here.

### Supporting

**Asafetida, fennel, nigella**

These bold seasonings play a significant role in pickles and preserves, and their feisty character complements and contrasts with main ingredients, too.

### Supplementary

**Ajwain, amchoor**

With its thymelike flavor, ajwain is often used with fish and starchy vegetables, while amchoor cuts through richness with its fruity tartness.

## CENTRAL INDIA

*Tart | Nutty | Assertive*

Influenced by the culture of neighboring Rajasthan, Gujarat, and Maharashtra, India's central states transform vegetarian staples into memorable dishes with a creative use of contrasting spices. A well-known simple seasoning is a trio of fried nigella, fenugreek, and fennel seeds, which lends a pickled flavor to softened vegetables and meaty masalas. Meat eaters are catered to with predominantly Mughal-style dishes. In Bhopal, Madhya Pradesh's capital city, cafés serve biryanis, kebabs, and aromatic curries spiced with garam masala emboldened with plenty of pounded coriander seeds.

“

*A sprinkling of amchoor mango powder can elevate fried potatoes to star status in central India.*

”

### LOCAL SPICE BLEND

#### *Chaat masala*

A seasoning sprinkled over street snacks, fruit salads, and kebabs.

<b>2 tbsp</b> cumin seeds	<b>1 tsp</b> ground ginger
<b>1 tsp</b> coriander seeds	<b>½ tsp</b> asafetida
<b>1 tbsp</b> black peppercorns	<b>1 tbsp</b> kala namak (Himalayan black salt)
<b>3 tbsp</b> amchoor	<b>1 tsp</b> salt

Toast the whole spices in a frying pan, over medium heat, until fragrant. Leave to cool and then mix with the other ingredients and grind to a powder.

*Panch phoran translates as “five spices.” Bengali versions substitute local spice radhuni for mustard seed.*





## LOCAL SPICE BLEND

*Panch phoran*

This whole spice mix is a Bengali and Bangladeshi speciality, and is particularly good for flavoring dhals and vegetable dishes.

- 2 tsp** cumin seeds
- 2 tsp** brown mustard seeds
- 2 tsp** fennel seeds
- 1 tsp** nigella seeds
- 1 tsp** fenugreek seeds

Simply mix together the whole spices. To use, fry a teaspoonful in oil or ghee at the start of cooking, or to temper a dish just before serving.

## EAST INDIA AND BANGLADESH

*Pungent | Sweet-sour | Mustardy*

Cooks in the river delta of West Bengal and Bangladesh embrace complex spice blends, which work especially well with fish and seafood. For religious reasons, many Hindus in Kolkata don't cook with onions and garlic, preferring the distinctive nature of nutty-tasting poppy seed paste, popped mustard seeds, ginger, and the aromatic five-spice mix of *panch phoran*. Bangladeshi Muslims favor more strident seasonings in such dishes as Mughal-style biryanis and beef curries infused with whole spices.

*Masor tenga* fish curry featuring *panch phoran*, see p.211. ▼

### SPICE PALETTE



*mustard*



*ginger*

#### *Signature*

**Chili, mustard, turmeric, cumin, ginger, garlic**

Although chilis get top billing in hilly regions, flavorings in the plains are characterized by contrasting spice combinations cooked in mustard oil.

#### *Supporting*

**Poppy, black cardamom, fennel**

Taking the edge off the more assertive signature spices is a cast of "carrier" seasonings, which provide depth of flavor and richness to classic dishes.

#### *Supplementary*

**Coriander, fenugreek, nigella**

Fried nigella seeds lend a nutty and pickled flavor to vegetable and meat dishes, and their piquancy is complemented and balanced by bitter fenugreek and citrusy coriander seeds.





**SPICE  
PALETTE***mustard**dried red chili**curry leaf**Signature*

**Kokum, dried red chili, cumin, turmeric, mustard, ginger, garlic**

These spices form the backbone of most cooking in this region, although garlic is shunned by the Jain community for religious reasons.

*Supporting*

**Fenugreek, curry leaf, black pepper**

Dishes from this region show restraint in their use of fenugreek seeds and curry leaves, but there's no holding back when peppercorns are roasted and ground into warming masalas.

*Supplementary*

**Asafetida, sesame**

Sesame seeds are so much more than a garnish: they add richness and a nutty character when roasted and ground, and are good vehicles for sulfurous asafetida.

► Vindaloo paste ready for use in a pork or chicken curry, see p.212.

**WEST INDIA***Bitter | Sour | Sweet*

The use of spices in western India reflects varied landscapes and cultures. The arid climate of Rajasthan and parts of Gujarat differs from the tropical atmosphere of Maharashtra and Goa, and the cooking styles are equally distinct. Savory dishes in Gujarat are characterized by sweet-sour flavors underpinned by jaggery and pungent spices such as fenugreek seeds and dried red chilis. Royal Rajasthani dishes are acclaimed for their richness and chili-laden masalas, while along the Konkan coastline, hot and sour fish curries, balanced by creamy coconut masalas, are emblematic. Goa is famed for accommodating vinegary and garlicky Indo-Portuguese dishes.

**LOCAL SPICE BLEND***Vindaloo paste*

The Goans adopted and adapted this fiery, sweet-sour mix from the Portuguese.

- 1½ tsp** cumin seeds
- 15–20** dried Kashmiri chilis, whole
- 1 tsp** black peppercorns
- 2 tsp** black mustard seeds
- 1 tsp** fenugreek seeds
- 6** cloves
- 1 tsp** cardamom seeds
- 2 in (5 cm)** piece of cassia
- ½** star anise
- 6 tbsp** cider vinegar or palm vinegar
- 1 tsp** fine salt
- 2 tsp** jaggery or date palm sugar

Toast the spices in a frying pan over a medium heat until fragrant, then grind. Transfer to a bowl, add the vinegar, salt, and jaggery, and mix to a stiff paste.





*Kokum is the dried rind of a fruit in the mangosteen family, used like tamarind to impart a sour flavor.*

## SOUTH INDIA AND SRI LANKA

*Fresh | Zesty | Robust*

From the cardamom hills of Kerala to Sri Lanka's cinnamon plantations and Andhra Pradesh's renowned chili harvest, this region's culinary traditions come from centuries of trading in spices. Influences from the Portuguese, French, Dutch, Southeast Asians, and British have been adapted to suit local tastes, but it's the stalwarts of *sambhar* (tart lentils with vegetables), rice in all its guises, and sour fish masalas that give distinction to this region's cuisine.

### LOCAL SPICE BLEND

#### *Gunpowder*

Sprinkle this distinctly southern condiment over rice dishes, *dosa* (lentil and rice pancakes), and *idli* (steamed rice cakes). When moistened with a little oil, it makes a robustly spiced dip.

- |  |   |
|--|---|
| <b>scant 1 oz (25 g)</b> chana dhal or split yellow lentils    | <b>2 tbsp</b> curry leaves (about 20)                 |
| <b>scant 1 oz (25 g)</b> split urad dhal or black gram lentils | <b>6–8</b> red chilis, mild or hot according to taste |
| <b>scant 1 oz (25 g)</b> fresh coconut or coconut flakes       | <b>1 tbsp</b> tamarind pulp                           |
| <b>1 tbsp</b> black sesame seeds                               | <b>¼ tsp</b> asafetida                                |
|  | <b>2 tsp</b> jaggery or date palm sugar               |

Toast the lentils in a dry pan over low heat for 7–10 minutes, stirring continuously, until colored. Transfer to a bowl and leave to cool. Toast the coconut for 3–4 minutes in the same way. When it turns pale golden, add the sesame seeds, curry leaves, and chilis, and continue cooking until the chilis have darkened.

Stir in the tamarind pulp and asafetida, and toast for 1 minute before adding the sugar. Turn off the heat and stir until the sugar has melted. Scrape all these ingredients into the lentils and leave to cool, before grinding to a coarse powder. Spread on a tray to dry for 1 hour.

### SPICE PALETTE



*tamarind*



*cardamom*

#### *Signature*

**Tamarind, mustard, fenugreek, cumin, cardamom, ginger, garlic, curry leaf, chili**

Dishes are characterized as mild and mellow or bold and fiery depending on whether the spices have been dry-roasted, fried, pounded, or left whole.

#### *Supporting*

**Cassia, cinnamon, black pepper, nutmeg, asafetida**

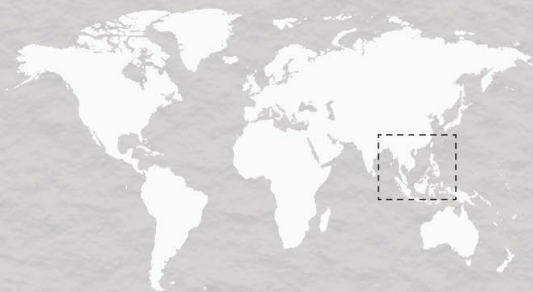
Cassia is stronger and harsher in flavor than cinnamon, and lends itself to boldly seasoned masalas. Both spices work well with the warmth of peppercorns, nutmeg, and chilis.

#### *Supplementary*

**Sesame, star anise, mace**

It's likely that star anise was introduced to this region by Chinese traders, since very little is grown in South Asia. Its fennel-like sweetness is well matched with the nuttiness of toasted sesame seeds and aromatic mace.











*World of Spice*

# SOUTHEAST ASIA

When Portuguese traders brought the chili pepper to Southeast Asia, they started a culinary revolution: it now dominates spice palettes across the region, along with characteristic fresh spices, such as garlic, ginger, and lemongrass.

SPICE REGIONS	
	<b>Myanmar</b> p.48
	<b>Thailand, Laos, and Cambodia</b> p.49
	<b>Vietnam</b> p.50
	<b>Malaysia and Singapore</b> p.51
	<b>Philippines</b> p.53
	<b>Indonesia</b> p.52









**SPICE  
PALETTE**

ginger



garlic

*Signature***Ginger, garlic, chili**

Early Chinese, and more recent Thai, influences have had a lasting impact on the Burmese spice palette: few savory dishes omit the base notes from this trio of fresh spices.

*Supporting***Garam masala, mild curry powder, sesame, coriander, lemongrass, turmeric, cumin**

Centuries of trade across the Bay of Bengal have seen Indian flavors well integrated into local recipes, with garam masala a particularly popular blend.

*Supplementary***Black pepper, star anise, cinnamon, curry leaf, tamarind, poppy**

Spices that pack a punch without flooring other flavors are valued in Myanmar: the aromatic warmth of pepper, star anise, and cinnamon; sulfurous curry leaves; sour tamarind; and richly nutty poppy seeds.

**MYANMAR***Punchy | Fragrant | Savory*

Varied terrain, climate, and ethnicity bring eclectic flavors to the Burmese table, where dry spices from India and Bangladesh are used sparingly to enhance the flavor of freshly pounded spice pastes. The cuisine is less sweet than that of neighboring Thailand, with sour notes popular, and a preference for subtle pungency over pure heat. Fresh, fragrant leaves (both cultivated and wild) find their way into most dishes, as do various fermented fish products.

“

*Influences from over 100 indigenous groups, and from powerful neighbors, feed into Myanmar's rich bank of traditional recipes.*

”

**LOCAL SPICE BLEND***Burmese garam masala*

India's most famous spice mix is also popular in Myanmar. Use as the basis for spicing a dish, or like a seasoning added at the end of cooking.

- |                                |                                     |
|--------------------------------|-------------------------------------|
| <b>1 tsp</b> coriander seeds   | <b>1 tsp</b> cardamom pods          |
| <b>1 tsp</b> black peppercorns | <b>1 tsp</b> cloves                 |
| <b>1 tsp</b> cumin seeds       | <b>1 in (2.5 cm)</b> cinnamon stick |
| <b>2</b> dried bay leaves      | <b>2</b> star anise                 |

Toast all the spices in a frying pan, over low heat, until fragrant. Leave to cool before grinding into a fine powder.

*Pandan leaves are used to impart a vanilla-like flavor, particularly to coconut-based sweet dishes.*

Thai salad of sliced steak, chili and lime dressing, and *khao kua*. ▼





## LOCAL SPICE BLEND

*Khao kua*

This ground roasted rice powder, infused with fresh spices, is a key ingredient in both Laotian *larb* and Thai beef salad. Its unique texture means nothing else can be used as a substitute.

- 5 tbsp** uncooked glutinous ("sticky") rice
- 1** lemongrass stalk, sliced
- 1** thumb-sized piece of galangal or ginger, sliced
- 3** makrut lime leaves, roughly torn

Toast all the ingredients in a frying pan over a medium heat, stirring frequently, until the rice turns golden brown. When cool, pick out the spices and pound the rice using a pestle and mortar until coarsely ground.

# THAILAND, LAOS, AND CAMBODIA

*Hot | Fresh | Clean*

No other country along the spice route embraced the chili pepper as enthusiastically as Thailand. It's impossible to imagine Thai cuisine without liberal quantities of chili, though the blander flavors of the Cambodian kitchen do hint at what pre-chili Thai food would have tasted like. Other spice staples were less eagerly adopted and, like cooks in landlocked Laos, Thai chefs still prefer freshly pounded spice pastes. Cambodian cuisine, meanwhile, draws its more subtle heat from the black pepper that has been grown in the country since the 13th century.

## SPICE PALETTE



*black pepper*



*lemongrass*

### *Signature*

**Chili, garlic, coriander root, lemongrass**

All four fresh spices are near ubiquitous in Thai and Laotian cuisine. Cambodian cooks use less chili but enthusiastically embrace the rest.

### *Supporting*

**Lime leaf, galangal, ginger, krachai (wild ginger), black pepper, tamarind**

Several roots in the ginger family, along with makrut lime leaves, provide further fresh flavors, while tamarind is drawn on for sour notes, and black or white pepper for slow-burning heat.

### *Supplementary*

**Turmeric, clove, nutmeg, cinnamon, fennel, cardamom, pandan leaf, green pepper**

Although widely available throughout the region, dry spices tend to find their way into a limited number of dishes rather than everyday cooking.





## SPICE PALETTE



star anise

lemongrass

### Signature

#### Ginger, garlic, chili

A Chinese influence can be seen in this trio of fresh spices, which provide the foundation that supports all the herbs so beloved by Vietnamese cooks.

### Supporting

#### Lemongrass, coriander root, star anise, allspice, turmeric, dill, pandan leaf, black pepper

Aromatic spices add a rich flavor profile to broths and stews, while black pepper provides background heat in dishes deemed too delicate for chili.

### Supplementary

#### Cardamom, licorice, fennel, cinnamon, clove

Rarely center stage, these spices are often used to bring in background notes of sweetness and warmth.



## VIETNAM

*Fresh | Warm | Delicate*

While not as influenced by the spice trade as Malaysia or Indonesia, Vietnam nevertheless keeps a well-stocked spice cupboard. Most dishes carry some vital base notes from dried aromatics, but, on the plate, it tends to be the abundance of fresh herbs that stands out more. Southern Vietnamese cuisine is more richly spiced than its northern counterpart, while sour, salty notes are prevalent throughout the country. To an already well-balanced Vietnamese kitchen, French colonialists brought a delicate way with more European spices, such as dill, fennel, and licorice.

### LOCAL SPICE BLEND

#### *Nuoc cham*

No Vietnamese table setting is complete without a bowl of *nuoc cham* dipping sauce, used for dunking anything from spring rolls to grilled meats and seafood.

- 2 bird's eye chilis, roughly chopped
- 1 garlic clove, roughly chopped
- 2 tsp palm sugar
- juice of ½ a lime
- 2 tbsp Vietnamese fish sauce (*nuoc mam*)

Place the chili, garlic, and sugar in a pestle and mortar, and pound into a paste. Squeeze in the lime juice, add 2 tablespoons of water and the fish sauce, then mix well.





▲ Prawn summer rolls for dipping in *nuoc cham*, see p.212.

*Bird's eye chilis are popular in Vietnam and were probably introduced in the 16th century by the Portuguese.*

## MALAYSIA AND SINGAPORE

*Complex | Rich | Fusion*

The southern Malay port of Melaka was ideally placed to become a major trading hub, both for ships plying the Indo-Chinese seas, and those bound for more distant destinations on the spice route. As a result, throughout Malaysia and Singapore, significant Chinese, Indian, and Muslim communities endure to this day, and the regional cuisine is distinguished by a willingness to embrace such varied cultural influences and experiment with new flavors. The concept of fusion food, as we know it, was arguably born in Melaka, where Chinese, Indian, Arabic, and European ingredients often find themselves in the same cooking pot.

### LOCAL SPICE BLEND

#### *Malaysian fish curry paste*

Layering a fresh base of galangal, garlic, and shallots with an Indian-style dry spice masala, this classic fusion paste can be used to make a quick fish curry by mixing it with coconut milk and simmering with chunks of any firm white fish.

- |                                |                               |
|--------------------------------|-------------------------------|
| <b>2 tsp</b> coriander seeds   | <b>thumb-sized piece</b>      |
| <b>1 tsp</b> cumin seeds       | of galangal or ginger, peeled |
| <b>½ tsp</b> fennel seeds      | and roughly chopped           |
| <b>½ tsp</b> black peppercorns | <b>3</b> large garlic cloves, |
| <b>4</b> medium-sized          | roughly chopped               |
| dried chilis                   | <b>1¼ oz (50 g)</b> shallots, |
| <b>½ tsp</b> turmeric          | roughly chopped               |

Lightly toast the whole dry spices in a frying pan, leave to cool, then grind to a powder along with the turmeric. In a food processor or using a hand blender, blitz together the galangal, garlic, and shallots with a splash of water to form a purée. Mix the dry masala with the fresh purée to form the curry paste.

### SPICE PALETTE



*galangal*



*curry leaf*

#### *Signature*

##### **Ginger, garlic, chili**

The classic Southeast Asian flavor trilogy forms the base of most savory recipes in Malaysia and Singapore, but the three are rarely used on their own.

#### *Supporting*

##### **Cardamom, turmeric, dried chili, black pepper, clove, coriander seed and root, cumin, cinnamon, curry leaf, lemongrass, galangal, tamarind, pandan leaf, lime leaf**

Dried spice mixes add warm, earthy base notes to support the fresh aromatics of the likes of lemongrass, makrut lime, and curry leaves.

#### *Supplementary*

##### **Fennel, anise, star anise, dried ginger, cassia, Sichuan pepper, sesame**

Malay cooks were enthusiastic adopters of most new arrivals along the Spice Route, creating richly flavored dishes with multi-layered spicing.



## SPICE PALETTE



ginger



garlic

### Signature

#### Garlic, ginger, shallot

Indonesian cooks draw on a wide range of spices, but few are used as extensively as this trio, which form the base notes for countless recipes.

### Supporting

#### Nutmeg, mace, clove, salam leaf, galangal, lemongrass, pandan leaf, lime leaf, tamarind, chili, turmeric, cumin, cinnamon

Indigenous nutmeg, mace, and cloves mingle with fresh, aromatic leaves and roots—including sour, astringent salam leaf—and the warm notes of Spice Route imports.

### Supplementary

#### Black pepper, coriander, curry leaf, cardamom, curry powder, Sichuan pepper, caraway, anise

Further spices from India, along with Sichuan pepper from China, and caraway and anise from the Mediterranean, complete Indonesia's broad-ranging arsenal of flavors.

# INDONESIA

*Vibrant | Complex | Diverse*

Spread across an archipelago of more than 17,000 islands with strong natural resources and long-established trade routes, Indonesia enjoys a spice palette that's as eclectic as the heritage of its people. The traditional saying "if your eyes do not water, the food is not good" hints at a nation that fully embraced the 16th-century arrival of the chili pepper, but there is more to Indonesian cuisine than eye-watering heat. Fragrant local spices mix with exotic imports from Persia, India, and China to create dishes with complex depth of flavor.

## LOCAL SPICE BLEND

### *Bumbu*

Many Indonesian recipes are based on some kind of *bumbu* (spice paste). Every region—and cook—has their own favorite version.

This one's quite classic.

- |   |   |
|---|---|
| <b>1 tsp</b> coriander seeds  | <b>1 in (2.5 cm)</b> fresh turmeric, peeled and roughly chopped |
| <b>3</b> cloves   | <b>6</b> shallots, roughly chopped                              |
| <b>½ tsp</b> white peppercorns                                      | <b>3</b> garlic cloves, roughly chopped                         |
| <b>1 pinch</b> grated nutmeg  | <b>2</b> red chilis, roughly chopped                            |
| <b>½ in (1.5 cm)</b> galangal or ginger, peeled and roughly chopped | <b>1 tsp</b> shrimp paste                                       |
|   | <b>1 tbsp</b> vegetable oil, for frying                         |

You can use a blender, but the best flavor is achieved by pounding using a pestle and mortar: start with the dry spices, then add fibrous galangal and turmeric, followed by the remaining fresh ingredients, finally mixing in the shrimp paste.

Heat the oil in a wok or frying pan, add the spice mixture, and cook over high heat, stirring frequently, for approximately 5 minutes, or until the paste turns golden. Cool before using.

*Adobo is a Spanish term applied by colonists to the native Filipino technique of preserving meat with vinegar and spices.*

The simple selection of spices for *adobo* marinade. ▼





## LOCAL SPICE BLEND

*Adobo marinade*

Filipino recipes often start with a simple marinade, usually with coconut vinegar in a starring role. Use this recipe to marinate chicken or pork overnight.

See pp.208–209 for a spiced-up version of adobo.

**3½ fl oz (100 ml)** coconut or cider vinegar

**1¼ fl oz (50 ml)** soy sauce

**3** garlic cloves, crushed

**1 tsp** black peppercorns

**2** bay leaves

Place all the ingredients in a small saucepan and bring the mixture to a boil. As soon as it boils, remove from the heat and allow to cool to room temperature before using.

**PHILIPPINES**

*Mild | Colorful | Aromatic*

Given how important food is to the Filipino way of life (five meals a day is the norm), dishes are surprisingly unadventurous with their spicing. Most classic recipes use no more than two or three spices, and very few would classify as “spicy” in the hot sense. Despite more than 300 years of Spanish rule, which clearly left their mark on a spice palette that feels more European than Asian, the Philippines didn’t take to the chili pepper in anywhere near the same way as the Spanish and their trading partners along the Spice Route.

**SPICE PALETTE***Signature***Bay, black pepper, garlic**

This “holy trinity” of Filipino cuisine is in nearly every savory recipe, including the unofficial national dish, *adobo*.

*Supporting***Annatto, turmeric, ginger, lemongrass, pandan leaf**

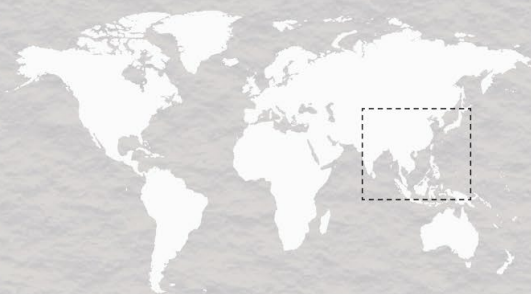
Spices are rarely used to add heat, but often as natural food coloring (red from annatto, yellow from turmeric) or for their aromatic properties.

*Supplementary***Chili powder, paprika, tamarind**

When Filipinos do reach for the hot stuff, they tend to choose powder over fresh chilis, or opt instead for paprika. Tartness is valued over heat, and tamarind is the main flavor constituent of the popular *sinigang* broth.







## *World of Spice*

# EAST ASIA

Despite being at the far eastern edge of the Old World, East Asia has influenced the global spice trade hugely, from key stops on 15th-century trade routes to being the world's fourth-largest spice producer today. Most of the spices here are mild; Sichuan pepper is a tongue-tingling exception.

### SPICE REGIONS

	<b>West China</b> p.61
	<b>North China</b> p.58
	<b>East China</b> p.59
	<b>South China</b> p.60
	<b>South Korea</b> p.56
	<b>Japan</b> p.57





*The road begins*

The Silk Road was the world's greatest trade thoroughfare until the 15th century, when faster sea routes were found. The Chinese city of Chang'an (now Xi'an) marked the start of this 4,000-mile (6,400-km) network.

**Xi'an**  
The Western Market in the old city of Chang'an was a meeting place for traders from all over the world.

**Beijing**

**GINGER**  
Ginger from China's Shandong region is prized for its high quality.

**SICHUAN PEPPER**

This key spice is a distinguishing feature of East Asian cuisine.

**CASSIA**

This sweet spice grows in the tropical climate of southern China.

**Yangon**

**Chengdu**  
The city's market is known worldwide for the quality of its Sichuan peppercorns.

**Macau**

**TAIWAN**

**Manila**

**CHINA**

**SESAME**  
Grown widely in East Asia, sesame is one of the world's oldest crops.

**PERILLA SEEDS**

Also known as shiso, perilla is grown mainly in central Japan.

**SOUTH KOREA**

**Yeosu**

**Nagasaki**

Portuguese traders made Nagasaki their Japanese base in the late 16th century.



**LICORICE**

Licorice gives meat marinades in southern China a sweet-salty tang.

*Flavor exchange*

The spice trade between China and the West went both ways: spices such as cassia traveled west to Central Asia and Europe, while ginger and saffron went east and became integral to cooking in many regions of China.

**KEY**

-  Historical spice trade routes
-  Ancient Silk Road





**SPICE  
PALETTE***red chili**garlic**Signature***Sesame, red chili, garlic**

Korean spicing is full-bodied and robust, but subtle, too, with the pungency of chilis and garlic often balanced by the rich, toasty flavors of sesame, or mellowed through fermentation in dishes such as kimchi.

*Supporting***Ginger, black pepper, perilla seeds**

Supporting spices such as ginger and pepper add deeper notes of pungency, with hints of mint and licorice from the perilla seeds.

*Supplementary***Green chili, cinnamon**

While red chilis provide the fire in fermented dishes, green chilis and cinnamon bolster the pungent and sweet aspects of Korean dishes.

**SOUTH KOREA***Fiery | Warm | Pungent*

Korean cooking has only recently become as popular across the world as other long-established Asian flavors, but with its intoxicating blend of heat and acidity in a cuisine that is complex, robust, and subtle, it has quickly come to be a favorite.

Unsurprisingly, given Korea's location and history of colonization by China and Japan, influences and spices from these neighbors abound, with chilis, ginger, and garlic playing important roles. Yet the key techniques of fermentation and preservation in which they are employed create flavors and dishes that are unique to this country.

## LOCAL SPICE BLEND

*Yangnyeomjang*

A very popular and deeply flavored, pungent seasoning sauce. It also makes a great dipping sauce and marinade.

**2 tsp** white sesame seeds**3 tbsp** soy sauce**1 tbsp** toasted sesame oil**½ tsp** rice vinegar**2 tsp** *gochugaru* (dried chili peppers)**½ tsp** caster sugar or honey**1** garlic clove, crushed**1** spring onion, sliced

Toast the sesame seeds in a frying pan, over high heat, stirring until just golden. Mix with the other ingredients and keep in the fridge for up to a week.





*Perilla seeds are from a plant in the mint family. They have a nutty, slightly menthol-aniseed flavor.*

◀ Pan-fried tofu with spring onions and *yangnyeomjang*.



## JAPAN

*Fresh | Mild | Bright*

For a relatively small archipelago, Japan is surprisingly diverse in its cooking and spicing. The southern “barbarian” cuisine was developed in the 16th and 17th centuries through interaction with the few foreigners who were allowed to visit the island. The Portuguese introduced deep-frying, chilis, and vinegar, the Chinese brought ramen, gyoza, and dumplings, and the British introduced curry. This Western-influenced cuisine contrasts with the more subtle *washoku* (Japanese cuisine) found elsewhere in the country.

“

*All Japanese cooking shares an emphasis on the natural world, with seasonality at the heart of everything.*

”

### LOCAL SPICE BLEND

#### *Shichimi-togarashi*

This aromatic mixture can be used as a table condiment or for flavoring curries, grilled meats, and noodle dishes.

- |  |  |
|--|--|
| <b>2 tbsp</b> <i>sanshō</i> or Sichuan pepper, finely ground | <b>2 tbsp</b> nori seaweed flakes                  |
| <b>2 tbsp</b> dried orange, yuzu, or lemon peel              | <b>2 tsp</b> black sesame seeds                    |
| <b>4 tbsp</b> chili powder                                   | <b>2 tsp</b> hemp seeds, flax seeds, or chia seeds |
|  | <b>2 tsp</b> garlic powder                         |

Simply mix together all the ingredients.

### SPICE PALETTE



*sesame*



*ginger*



*star anise*

#### *Signature*

##### **Sesame, *sanshō*, ginger**

The richness of sesame, citrus heat of *sanshō* (similar to Sichuan pepper), and fresh zing of ginger are representative of a cuisine that manages to be both pungent and subtle.

#### *Supporting*

##### **White pepper, chili, garlic, star anise**

Additional levels of heat come from the fire of chilis and the slow burn of white pepper, while garlic and star anise bring complex aromas of sulfur and licorice.

#### *Supplementary*

##### **Clove, allspice, cinnamon, black pepper**

These stronger spices are used sparingly, their aim being to layer flavors without overwhelming the key Japanese elements of freshness and brightness.



**SPICE  
PALETTE**

sesame

Sichuan pepper

*Signature***Ginger, sesame, Sichuan pepper**

Freshness and simplicity are at the heart of this region's dishes, in which spices are used sparingly alongside lamb, beef, fish, and wheat.

*Supporting***Star anise, garlic**

Tofu and fresh vegetable dishes in Shandong cooking make use of fragrant star anise, while among Beijing's Muslim population garlic is combined with lamb and beef.

*Supplementary***Cumin, chili**

Having originated in the kitchens of Chinese Muslims, *yangrou chuan* (lamb skewers) are coated in cumin and chili and are a favorite in Beijing.

**NORTH CHINA***Salty | Sour | Light*

In a country as vast as China there are huge variations in cuisine, but when it comes to spicing it's a more integrated picture, with most of the country incorporating the gentle spices used in the Shandong, Henan, and Beijing cuisines of northern China. Shandong cooking is characterized by subtle flavors that preserve rather than dominate the main ingredients. Henan features more delicate but harmonious flavors, and Beijing draws influences from both, with an emphasis on sour notes provided by the dark vinegar used throughout the region.

“

*Shandong is regarded as the primary cuisine of China's eight major regional cuisines.*

”

## LOCAL SPICE BLEND

*Shandong spice bag*

This collection of spices is used to infuse the master stock for many northern Chinese chicken stews, such as Dezhou- or Daokou-style.

<b>10</b> cardamom pods	<b>3 in (7.5 cm)</b> cinnamon stick
<b>2</b> star anise	<b>4–5 in (10–12 cm)</b> piece of licorice root
<b>½ tbsp</b> whole Sichuan pepper	dried peel of an orange or tangerine
<b>½ tbsp</b> cloves	
<b>½ tbsp</b> ground cumin	

Place all the ingredients in a piece of muslin or spice bag, tie tightly, and drop into the cooking water.



▲ Muslin and ingredients ready to make a Nanjing spice bag.

*Lotus seeds have a mild, sweet flavor reminiscent of fresh almonds and pine nuts.*





#### LOCAL SPICE BLEND

### *Nanjing spice bag*

These spices are combined with sliced fresh ginger and Shaoxing wine to flavor the stock for the renowned Nanjing salted duck (see p.212).

**6** cloves

**4** star anise

**1 tsp** whole white pepper, crushed

**6** bay leaves

dried peel of an orange or tangerine

**1 tsp** licorice root powder

**1 tsp** salt

Place all the ingredients in a piece of muslin or spice bag, tie tightly, and drop into the cooking water.

## EAST CHINA

*Subtle | Aromatic | Sweet*

Eastern Chinese cuisine is a contrasting mix of flavors determined largely by the varying terrain. Inland, the Yellow Mountains and the Huangshan area are the preserve of unique foraged ingredients in Anhui cuisine, which is often sweetened with sugar to create hearty peasant food. The coast, by contrast, taking in Jiangsu, Zhejiang, and Shanghai, has a refined gourmet cuisine whose emphasis is on subtly aromatic flavors that highlight the abundant sea and river food of the region.

### SPICE PALETTE



*ginger*



*white pepper*

#### *Signature*

**Ginger, white pepper, Sichuan pepper, sesame**

The signature spices of this region never dominate; rather they are used to bring out the flavors of the fish or meat component of a dish.

#### *Supporting*

**Star anise, cinnamon, lotus seed**

The four styles of Jiangsu's cuisine use sweet aromatics like star anise and cinnamon in dishes such as Wuxi spare ribs. Desserts like lotus porridge are another favorite.

#### *Supplementary*

**Black cardamom, fennel, cumin, licorice**

Suzhou's pastries are made with a wide range of spices and spice-based ingredients that offer smoky, sweet, salty, and nutty flavors, as well as powerful aromatics.



**SPICE  
PALETTE**

ginger



garlic

*Signature***Garlic, ginger, chili, sesame**

South China's signature spices intensify and enhance the techniques that are geared toward preserving the flavor, color, and texture of the main ingredients.

*Supporting***Black pepper, *shajiang*, five-spice powder**

Woody black pepper and camphorous *shajiang* powder add a kick to many dishes, while five-spice is used to enhance sweetness and fragrance.

*Supplementary***White pepper, licorice**

Licorice root replaces five-spice where a more lingering, bitter, aniseed flavor is desired. In Taiwan, white pepper is often paired with pork belly.

**SOUTH CHINA***Sour | Aromatic | Sweet*

If there's one Chinese cuisine that has traveled throughout the world, it's the Cantonese food from Guangdong, the most southerly of the country's eight great food traditions. Thanks to extensive emigration from this largely coastal region, cooking techniques such as steaming and stir-frying traveled the world. Simple condiments and spicing—light soy sauce, garlic, ginger, and sesame oil—dominate in Canton cooking, but other parts of south China's cuisines, notably Hunan, Fujian, and Taiwan, offer more intense flavors—spicy, sour, sweet, and bitter—via techniques such as drying and preserving and a wider use of spices.

## LOCAL SPICE BLEND

*Five-spice powder*

Yes, you can buy this in any supermarket, but homemade is truly a million times better. Use as a rub for roasting meats, or add to stir-fries and stews.

2 star anise

1 tsp fennel seeds

1 tsp cloves

2 in (5 cm) cinnamon stick

1 tbsp whole Sichuan pepper

Simply grind all the spices to a fine powder, sifting out any fibers if necessary.



Prawn stir-fry  
flavored with  
five-spice,  
see p.213. ▼



*Shajiang is also known as sand ginger, and has the same fresh heat as ginger, with a mildly medicinal edge.*



## WEST CHINA

*Fruity | Warm | Earthy*

The Silk Road introduced the Sichuan region to less familiar spices brought by travelers from neighboring western and central Asia. The result was a wide blend of flavor sensations, including sour, sweet, bitter, salty, hot, and spicy, especially in the far-west region of Xinjiang. Here, where the population is more than 50 percent Muslim, spices such as cumin and saffron, as well as dried fruits, feature heavily in lamb, chicken, and vegetable dishes from Uyghur and Kazakh cuisine.

“

*Western Chinese cuisine is dominated by Sichuan pepper, used in the region's cooking for more than 2,000 years.*

”

### LOCAL SPICE BLEND

#### *Chili black bean sauce*

This is a homemade version of *doubanjiang*, the Sichuan fermented bean paste. Use as a marinade, dip, or in stir-fries.

<b>7 oz (200 g)</b> red bird's eye chilis, finely chopped	<b>2 tsp</b> dark rice vinegar
<b>1¼ oz (50 g)</b> fermented black beans, rinsed and chopped	<b>1 tbsp</b> sugar
<b>2 tbsp</b> vegetable oil	<b>3</b> garlic cloves
<b>1 tbsp</b> rice wine	<b>3 in (7.5 cm)</b> piece of ginger, chopped

Fry the chilis and beans in the oil for 1 minute. Add the wine and vinegar and simmer for 3 minutes. Add the sugar and simmer for 10 minutes. Then add the garlic and ginger, and cook until the oil floats on the surface.

Store in the fridge for up to 3 weeks.

### SPICE PALETTE



#### *Signature*

##### **Bird's eye chili, Sichuan pepper, garlic**

In classic Sichuan dishes such as beef in chili broth, this trio of spices often dominates the flavor.

#### *Supporting*

##### **Star anise, ginger, sesame, black cardamom**

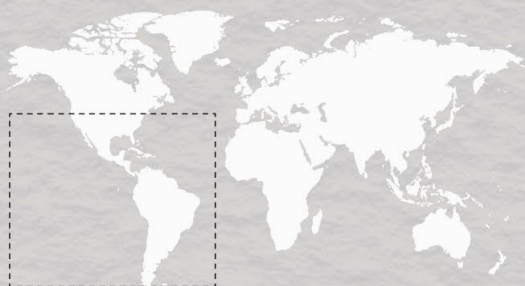
Used in both Sichuan and Xinjiang cuisine, star anise, ginger, sesame, and black cardamom add complexity to dishes such as bang bang chicken and hotpot.

#### *Supplementary*

##### **Cumin, saffron, cinnamon**

In Kashgar, the market is filled with the flavors that made their way to this Uyghur region from the Middle East, including cumin, cinnamon, and saffron.





## *World of Spice*

# THE AMERICAS

An amalgamation of flavors and textures from mountains high, valleys low, seas and oceans, forests and islands—plus an array of influences from all corners of Asia and Europe—the spice map of the Americas is eclectic, bold, and complex.

### SPICE REGIONS

	<i>North America</i> p.68
	<i>Mexico and Central America</i> p.65
	<i>The Caribbean</i> p.64
	<i>Pacific South America</i> p.69
	<i>The Amazon</i> p.67
	<i>The Andes</i> p.66


*To Asia*

### *Two-way traffic*

Spices traveled in both directions between continents. Cloves, pepper, and cinnamon reached the New World by sea from Asia; in return, chilis, vanilla, and cocoa beans were all transported back to the Old World.

*To Asia*

### KEY

 Historical spice trade routes





**UNITED STATES**

San Francisco

**MULATO CHILI**

Brown-black mulato chilis are grown extensively in Mexico.

**PAPRIKA**

Fresh, dried, or smoked, this spice is common in North American blends.

**United States**

The US is the world's largest importer of spices, with vanilla and pepper being the most popular.

To Europe

**ALLSPICE**

Allspice is the only spice exclusively grown in the western hemisphere.

**MEXICO**

Havana

**CARIBBEAN**

**Jamaica**

Explorer Christopher Columbus, who was searching for the source of black pepper, instead discovered allspice on Jamaica in the 1490s.

Veraerus

Panama

**CUMARI CHILIS**

These pea-sized peppers grow wild in the Amazon rainforest.

**Acapulco**  
In the 17th century, spices that arrived here from Asia were sent overland to Vera Cruz, and then by sea to Spain.

**CACAO**

Ecuador produces high-quality cacao, used to make premium chocolate.

Manaus

**PERU**

Lima

**BRAZIL**

Cusco

**MOLLE**

This spice is used to make chicha, a traditional spiced beer.

La Pas

*A new world*

Between the 15th and the 18th centuries the search for spices led European explorers on a series of voyages in uncharted seas. Their discovery of the Americas—the New World, as they called it—radically redrew the world map.

**CHILE**

Santiago

**GARLIC**

Chile is one of the Americas' main producers of garlic.

**Rio de Janeiro**

In 1502, the first Europeans to see Rio were members of a Portuguese spice-hunting mission.



**SPICE  
PALETTE***Scotch bonnet chili**clove**allspice**Signature***Scotch bonnet chili, allspice, clove, ginger, nutmeg, cinnamon**

Apart from Scotch bonnet, these staples are used across both sweet and savory recipes, with native allspice joined by fragrant spices from Asia.

*Supporting***Black pepper, cumin, garlic, paprika, habanero**

Mainly used to create greater depth in one-pot dishes, these spices bring flavors from South Asia, the Mediterranean, and Central America.

*Supplementary***Turmeric, coriander, fenugreek, cayenne, nigella**

The first three spices are integral to West Indian curry powder, cayenne is used in hotter jerk blends, and roasted nigella seeds flavor breads and vegetable dishes.

**THE CARIBBEAN***Adventurous | Bold | Spicy*

When European explorers went looking for the Indies, they found instead the Caribbean Islands. Centuries of empire-building ensued, almost wiping out the indigenous peoples and turning the West Indies into a new trading hub on the Spice Route. Such forces made Caribbean cuisine into the melting pot that it is today, fusing Native American, African, Creole, Spanish, Dutch, Portuguese, British, Latin American, Persian, South Asian, and Indonesian cuisines.

“

*The Caribbean's varied cultural influences make for adventurous spicing, including sweet, sour, hot, tangy, and earthy flavors.*

”

**LOCAL SPICE BLEND***Jamaican jerk rub*

A dry seasoning used to marinate chicken, fish, pork, and beef. Invented in Jamaica and adapted around the Caribbean.

<b>2 tsp</b> allspice	<b>1 tsp</b> ground ginger
<b>1 tsp</b> whole black peppercorns	<b>½ tsp</b> ground cinnamon
<b>½ tsp</b> cloves	<b>2 tsp</b> onion powder
<b>1 tsp</b> chipotle or cayenne powder	<b>2 tsp</b> garlic powder
<b>1 tsp</b> paprika	<b>1 tsp</b> dried thyme
<b>1 tsp</b> grated nutmeg	<b>2 tsp</b> brown sugar
	<b>2 tsp</b> sea salt

Grind the whole spices and combine with the rest of the ingredients. Flavor intensity depends on marinating time.

*Mexican oregano has pronounced citrus and aniseed notes. Dried, it is added to chili powder blends.*

Roasted vegetables served with mole sauce. ▼





## LOCAL SPICE BLEND

*Mole mix*

Each country has its own version, always made with three different chilis.

**2 each** dried ancho, pasilla, and mulato chilis

**3 tbsp** cacao nibs

**1 tbsp** sesame seeds

**¾ in (2 cm)** piece of cinnamon stick

**¼ tsp** cumin seeds

**¼ tsp** anise seeds

**¼ tsp** whole black peppercorns

**¼ tsp** cloves

**¼ tsp** dried thyme

**¼ tsp** dried marjoram

**1** dried bay leaf, crumbled

Toast the whole spices in a dry frying pan over medium heat, stirring, until fragrant. Mix with the remaining ingredients and grind. Stir into fried onions and garlic, then simmer with chopped tomatoes for a mole sauce.

# MEXICO AND CENTRAL AMERICA

*Hot | Toasted | Complex*

The range of spices used in everyday Mexican and Central American dishes is as complex as the region's historical culinary influences. Cultural fusion is key: Belizean cuisine draws from the Maya, the Garifuna, Creole, and even the British, while Mexico's dishes can thank Mayan, Aztec, and Spanish-colonial influences. The Mayans frequently made use of red and green jalapeño chilis; the Aztecs used chipotle chilis, cacao, and vanilla. All of these spices made their way around the world via the Spanish conquistadores, who in return brought cumin, pepper, cloves, and cinnamon.

## SPICE PALETTE



### Signature

**Chili (ancho, jalapeño, pasilla, mulato, chipotle, chile de arbol), paprika, cumin**

For that fiery kick, any of 60 different chilis offering varying degrees of heat are used, either fresh, whole dried, or powdered, while cumin is essential to chili powder mix.

### Supporting

**Black pepper, garlic, cinnamon, clove, vanilla**

Black pepper is usually slow cooked to draw out its complex pungency. Savory and sweet dishes draw on the latter three spices, with cinnamon traditionally flavoring local chocolate bars.

### Supplementary

**Cacao, sesame, allspice, Mexican oregano, coriander, annatto**

The first three spices all contribute to mole sauce, while Mexican oregano and coriander seeds bring extra complexity to chili blends. Annatto is mainly used for coloring meats, rice, and stews.





## SPICE PALETTE



turmeric



garlic

### Signature

**Chili** (*ají amarillo, rocoto/locoto, merquén*), cumin, garlic

Chilis lead Andean cuisine, offering heat, freshness, and color, and often starring as the main ingredient.

Spicy sauces pep up any slow-cooked dish.

### Supporting

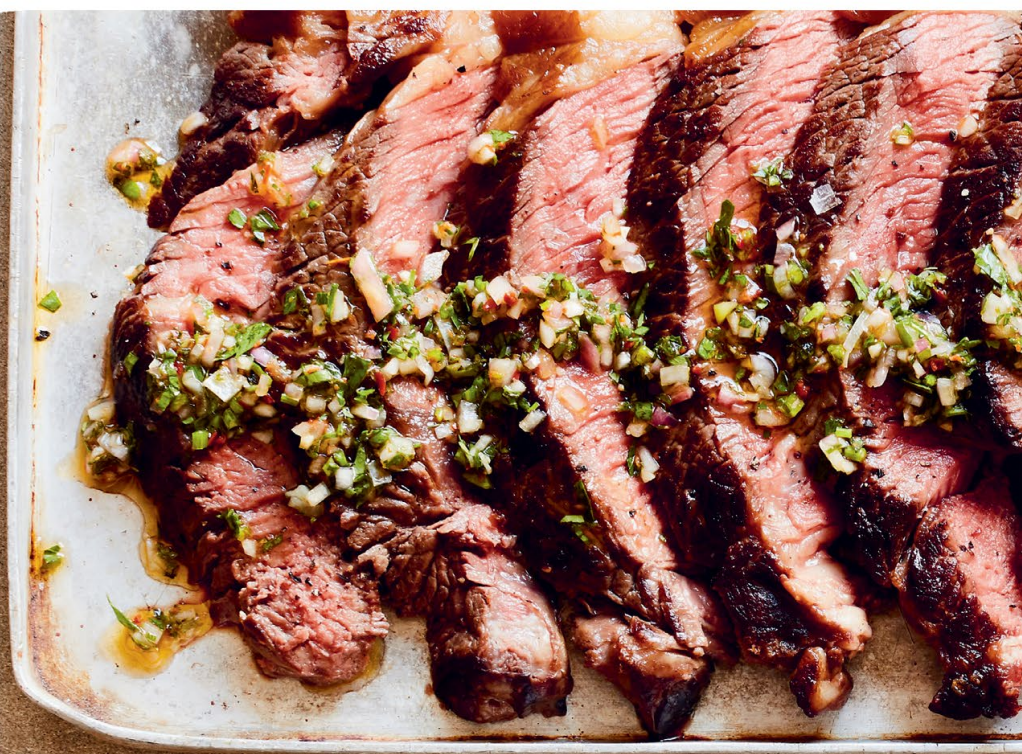
**Pepper** (white and black), *molle* (pink pepper), turmeric, cinnamon, paprika (sweet and smoked)

These warming spices tend to be added to slow-cooked stews and soups to create depth of flavor and color.

### Supplementary

**Annatto, coriander, mustard**

More usually seen in Mexico and Central America, annatto brings color to Andean dishes, too. Coriander and mustard seeds add subtly aromatic and warming touches.



## THE ANDES

*Warming | Earthy | Piquant*

Spanning some 4,500 miles, the Andes mountain range traces a route from Argentina and Chile, crossing through Bolivia, Peru, and Ecuador, up to Colombia and Venezuela. People who live in or close to the Andes at 3,250 to 10,000 ft (1,000 to 3,000 m) or more above sea level usually slow cook hearty dishes such as stews and soups. Chilis play a dominant role; *ají amarillo* (yellow chili) has been cultivated for more than 8,000 years and was a key ingredient in Inca cuisine. In Andean Peru, *uchucuta* is a spicy salsa made from *rocoto* chili and herbs; *llajua* is the Bolivian and Argentine equivalent.

### LOCAL SPICE BLEND

#### *Chimichurri*

A popular fresh spice and herb sauce, widely served with sausages and steak.

- 1 tsp chili powder
- ½ tsp dried chili flakes
- ½ tsp paprika
- 2 garlic cloves, finely chopped
- 1 onion, finely chopped
- 4 tsp finely chopped parsley or cilantro
- 1 tsp finely chopped oregano
- 3 tsp white or red wine vinegar
- 6 tbsp olive oil
- salt and black pepper, to taste

Place all the ingredients in a bowl and stir well to combine them.





▲ Slices of steak dressed with chimichurri.

*Molle are the dried pink berries of the Peruvian peppertree. They are similar to peppercorns, but the plants are unrelated.*

## THE AMAZON

*Exotic | Mysterious | Hot*

Ranging across nine different countries, the Amazon is the world's largest rainforest. Ancestral influence, convergence between the rainforest's three key countries—Brazil, Peru, and Colombia—plus an array of European influences, most significantly from Portugal and Spain, all play their part in this extensive larder. Amazon chilis are some of the world's hottest, and are often—along with garlic, cumin, and turmeric—used to marinate meat and fish.

“  
*Dominating the spice wheel are chilis, grown here since pre-Columbian times.*  
”

### LOCAL SPICE BLEND

#### *Tucupí*

A Brazilian brothlike sauce made from cassava root and served with duck, pork, or fish.

- 4½ lb (2 kg)** sweet cassava root, peeled and roughly chopped
- 2** garlic cloves, finely chopped
- 3–4** hot, fresh red chilis, finely chopped (or more to taste)
- 1 tsp** whole black pepper, ground

Blend the cassava with 1¼ pints (750 ml) water in a food processor to form a thick purée. Transfer to a muslin cloth placed over a bowl and squeeze out the starchy juice.

Leave to settle, then strain off the liquid into a jug, discarding the sediment. Cover the liquid and leave at room temperature for 24 hours to ferment. Pour into a pan, stir in the spices, bring to a boil, and simmer for 30 minutes.

### SPICE PALETTE



*black pepper*

*cumin*

#### *Signature*

**Black pepper, chili (ají amarillo, ojito de pez, pinguíta de mono, pucunucho, cumari, malagueta, cayenne), garlic, cumin**

With hundreds of native chili species, in all shapes and sizes, and ranging from mild to fiery hot, it's little wonder that they cross the spectrum to be used in many dishes.

#### *Supporting*

**Annatto, açai berries, jambú, tonka beans, turmeric**

*Jambú* is a flower whose numbing effect leads to its nickname of “toothache plant”. It is used in *tacacá*, one of Brazil's most popular soups.

#### *Supplementary*

**Priprioca, guaraná, ginger, cinnamon, clove, paprika, vanilla, copoazú, macambo**

The dried roots of *priprioca* (a type of sedge grass) offer up a peppery hit, while *guaraná* seeds are used as a stimulant more than for their flavor, but are very common. *Copoazú* and *macambo* are relatives of cacao.



## SPICE PALETTE



pepper



vanilla

### Signature

**Chili (jalapeño, poblano, ancho, cayenne), garlic, pepper (black and white), vanilla**

After garlic and chilis, pepper and vanilla are the most common spice imports, adding everyday warmth to savory and sweet dishes, respectively.

### Supporting

**Paprika, mustard, ginger, nutmeg, cinnamon, cloves**

Milder forms of mustard are used particularly in table condiments, while nutmeg, cinnamon, and cloves are the spices of choice for sweet baking.

### Supplementary

**Anise, sesame, cumin, paprika, turmeric, mace**

These diverse spices are used in dishes drawn from the cuisines of the Middle East and Asia, which have an increasingly strong influence on the North American food scene.

## NORTH AMERICA

*Hot | Sweet | Eclectic*

European settlers brought a limited range of spices with them to North America, mainly as a way to preserve food for the long journey. Gradually spices from Central America (chili, annatto), the Caribbean (allspice), and South America (*molle*) left their mark, though only chili has enjoyed an enduring popularity thanks to the proximity of Mexico. Today, North American cuisine is a true fusion, in which dishes from Mexican fajitas to Indian curries and Japanese ramen form part of the everyday diet.

“

*The eclectic spice palette of contemporary North America reflects the diverse migration that defines the region.*

”

### LOCAL SPICE BLEND

#### *BBQ rub*

A dry spice blend for barbecued meat, with many regional variations. This recipe takes brown sugar from Kansas City and paprika from the Memphis rub.

<b>1 tbsp</b> ground cumin	<b>½ tbsp</b> cayenne pepper
<b>1 tbsp</b> chili powder	<b>3 tbsp</b> brown sugar
<b>1 tbsp</b> ground black pepper	<b>2 tbsp</b> smoked paprika
<b>1 tbsp</b> onion powder	<b>2 tbsp</b> sea salt
<b>1 tbsp</b> garlic powder	

Mix together all of the ingredients to create a dry rub for barbecued meat, from steak or brisket to pulled pork and chicken wings.

*Aji limo is a hot chili with a strong lemony flavor, although it takes its name from the Lima region.*

Ceviche of raw white fish marinated in *leche de tigre*. ▶





## LOCAL SPICE BLEND

*Leche de tigre*

Translating as “tiger’s milk,” this is the marinating liquid for ceviche, the raw fish dish originally from Peru and now enjoyed all along the Pacific coast.

**½–1** *ají limo*, habanero, or other hot chili, finely chopped

**1** large garlic clove, crushed

**1 in (2.5 cm)** piece of ginger, coarsely grated

**1 tbsp** fresh cilantro stalks, finely chopped

**½** small red onion, finely chopped  
juice of **5** limes  
salt, to taste

Combine all the ingredients and refrigerate for 1 hour before using to marinate fresh white fish.

*Leche de tigre* is traditionally drunk after the fish has been eaten.

## PACIFIC SOUTH AMERICA

*Fresh | Spicy | Citrus*

From the Gulf of Panama to the tip of Patagonia, the vast coastline of South America naturally draws from its waters for sustenance: all manner of seafood is fried, grilled, or stewed. Indigenous culture, Spanish colonization, the slave trade, and Asian and Arab migrations have all influenced dishes, from delicate chili and coconut fish soups to hearty *charquicán* (beef and vegetable stew). Chilis are key to the spice mix, often used fresh in ceviche, while dishes in the Nikkei tradition—a fusion of Japanese and Peruvian cooking—draw on flavorings such as ginger, sesame, tamarind, and *umeboshi* (pickled plum) paste.

### SPICE PALETTE



*ginger*



*cilantro stalks*

#### Signature

**Chili (ají limo, panca, chombo), garlic, cilantro stalks**

Chilis, usually used fresh, are extremely prevalent and add zip to seafood dishes, while cilantro stalks bring a slightly floral flavor.

#### Supporting

**Cumin, chili powder, ginger, fresh lime, turmeric**

Cumin is used as a seasoning, while chili powder provides a milder alternative to fiery whole chilis. Fresh, clean ingredients, such as ginger and lime, are added to soups and stews.

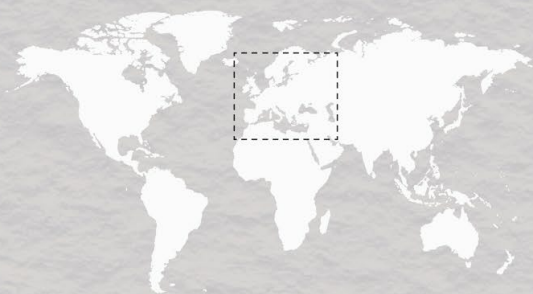
#### Supplementary

**Annatto, sesame, tamarind**

Tangy tamarind adds both sweet and sour touches, sesame lends a nutty richness, and annatto's bright red hue colors soups and stews.







## *World of Spice*

# EUROPE

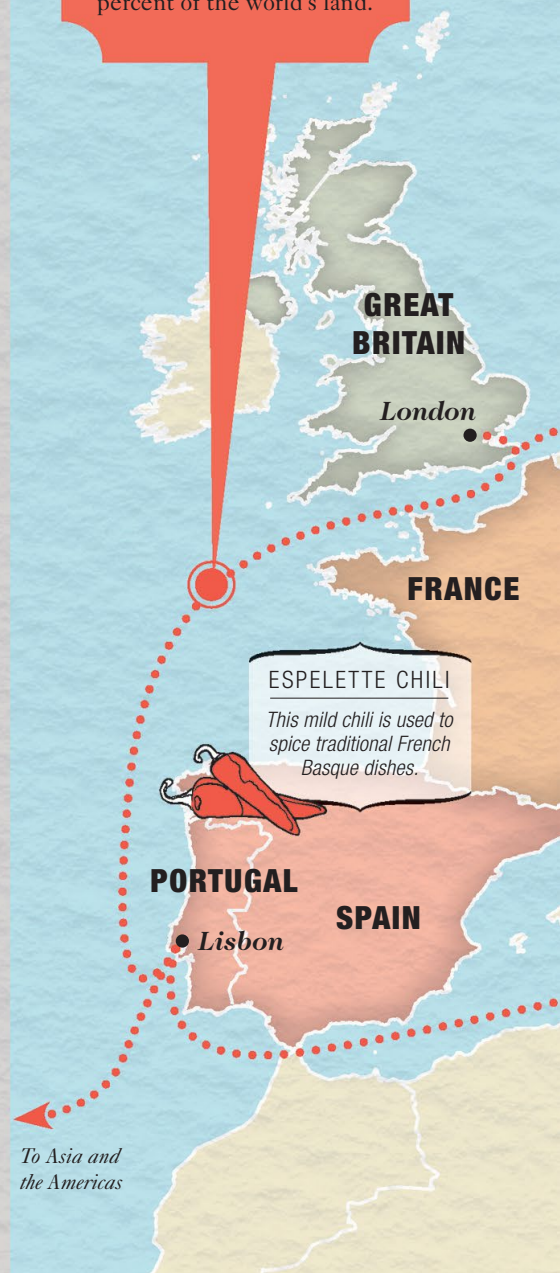
Despite the diversity of European cuisine, the continent has few native spices. Almost everything used across the region was introduced via the global spice trade, the legacy of which is that European spice palettes are broadly similar—though interesting regional variations still occur.

### SPICE REGIONS

	<b>Scandinavia</b> p.72
	<b>Great Britain</b> p.73
	<b>France</b> p.74
	<b>Spain and Portugal</b> p.75
	<b>Italy</b> p.76
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### *European empires*

Competition between the nations of Europe to control global trade, including in spices, led to these countries setting up colonies in Africa, Asia, and the Americas. By the end of the 19th century, Europe controlled 85 percent of the world's land.







*City built on spice*

Venice's location meant that in medieval times, most of the black pepper destined for Europe passed through the city. Venetian merchants controlled Europe's pepper trade, and consequently the city became extremely wealthy and powerful.



**SPICE  
PALETTE***Signature*

**Cardamom, cinnamon,  
caraway, dill, nutmeg**

Cardamom is king, although cinnamon runs a close second, while caraway is more popular in Finland. Dill seeds are common in pickling solutions.

*Supporting*

**Ground ginger, clove, allspice,  
licorice, mustard, saffron, juniper**

Ginger, cloves, and allspice are used more for seasonal sweet baking, although allspice is also paired with pickled herring and pork. Salty licorice is a unique Scandinavian treat.

*Supplementary*

**Angelica, bitter orange powder,  
dried rosehips, fennel**

Angelica and powdered orange peel are common in Finland—the latter is added to cookies, cakes, and the traditional Easter dessert, *mämmi*. Rosehips are used to flavor jelly, jams, oil, and tea.

**SCANDINAVIA**

*Sweet | Earthy | Aromatic*

The clean, refined fare of the Nordic countries has some of the most distinctive spicing in all of Europe. Most notable is the use of cardamom, supposedly brought north by the Vikings from Constantinople 1,000 years ago. Danish pastries and other Nordic baking would be lost without the festive flavors of cinnamon, cloves, ginger, and allspice. The region's love of pickling and preserving sees a profusion of aromatics such as dill seed and the native juniper, which also appears with game and in Finland's *sahiti* beer. Brown mustard is common both as a condiment and as a whole spice.

## LOCAL SPICE BLEND

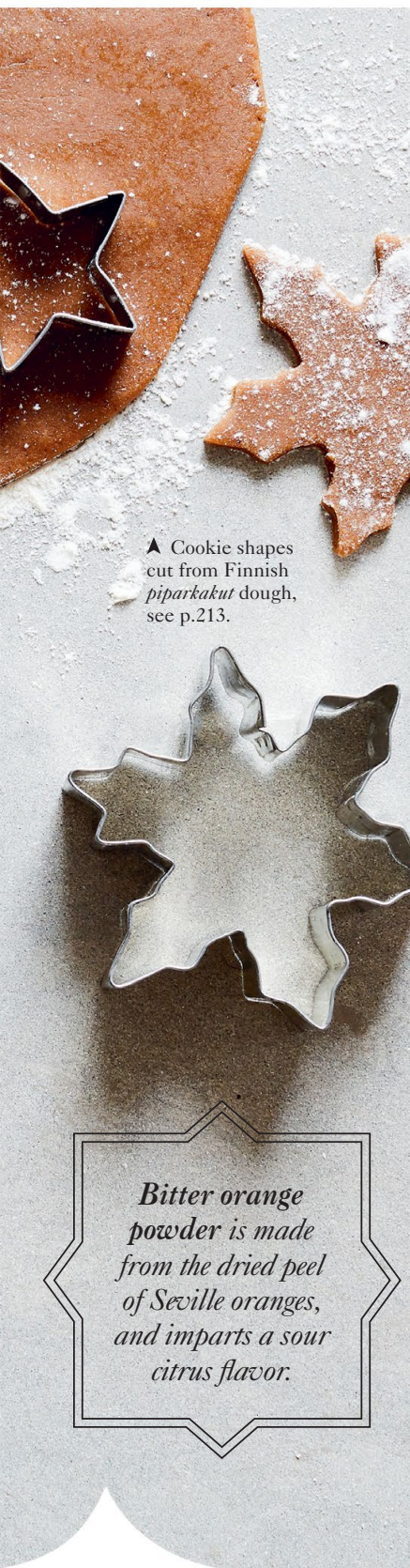
*Finnish  
gingerbread spice*

A fragrant, warming spice mix and the perfect base for the classic Finnish gingerbread known as *piparkakut*.

- 1 tbsp** bitter orange powder
- 2 tsp** ground cloves
- 2 tsp** ground ginger
- 2 tsp** ground cinnamon
- 1 tsp** ground cardamom

Simply mix all the ingredients together. Makes enough to flavor the dough for around 30 cookies.





▲ Cookie shapes cut from Finnish *piparkakut* dough, see p.213.

*Bitter orange powder is made from the dried peel of Seville oranges, and imparts a sour citrus flavor.*

## BRITAIN

*Warming | Gutsy | Festive*

One of the culinary legacies of the British Empire is a taste for South Asian spicing, often amalgamated into all-purpose curry powders. These are used liberally in the eponymous national dish, as well as a gravylike sauce for French fries, the vegetable preserve known as piccalilli, and the summer buffet staple Coronation chicken. Dating further back to Britain's medieval past is a love of warming aromatic spices for flavoring sweet pastries and alcoholic drinks consumed in the cold winter months; to a Brit, cloves, cinnamon, nutmeg, ginger, and mace are all immediately evocative of the festive season.

### LOCAL SPICE BLEND

#### *Mulling spice*

Warm red wine or cider is infused with this collection of whole sweet spices and traditionally drunk at winter celebrations, from Bonfire Night to orchard wassails on Twelfth Night.

- 2 cinnamon sticks
- 6 cloves
- 6 allspice berries
- ½ nutmeg
- 2 bay leaves

Add the spices to a pan of red wine or cider, or tie them up first in a piece of muslin for easy retrieval, and heat to simmering point. Add sugar or honey, orange and/or lemon slices, and rum or sloe gin to taste. Enough for two bottles of red wine or 3 pints (1.75 liters) of still cider.

### SPICE PALETTE



*mustard*



*clove*

#### *Signature*

**Curry powder, allspice, clove, cinnamon**

Curry powder is a mix of spices including fenugreek, turmeric, ginger, and cumin. Allspice is used in a myriad of sweet dishes and also in salted beef.

#### *Supporting*

**Mustard, cayenne pepper, nutmeg, mace, ginger, juniper**

Potent English mustard is an essential accompaniment to cooked meats, fiery cayenne is used in devilled kidneys, and juniper is most often used in game dishes.

#### *Supplementary*

**Saffron, white pepper, coriander, anise, turmeric**

Historically saffron and white pepper were popular, but their traditional use has largely dwindled to Cornish buns and preserved meats, respectively. In addition to use in pickling spice, coriander seeds flavor Lancastrian Goosnargh cakes.



## SPICE PALETTE



### Signature

**Garlic, mustard, fennel, nutmeg**  
French cooking and garlic are utterly inseparable. Whether smoked, fresh, or green, for many it is the defining taste of Gallic food.

### Supporting

**Caraway, vanilla, anise, white pepper, juniper, saffron**  
White pepper is essential to the *quatre épices* mix, and you'll find juniper used in Alpine regions, and saffron for the southern fish stew *bouillabaisse*. Caraway, vanilla, and anise flavor creams and cakes.

### Supplementary

**Angelica, tonka bean, clove, mace**

The French kitchen utilizes a number of more unusual spices: angelica stalk is added to candies and *digestif* liqueurs, while the powerful tonka bean is infused into creams and custards.

## FRANCE

*Pungent | Fragrant | Comforting*

France doesn't immediately spring to mind as a country with a spice-rich cuisine, yet the word itself is derived from Old French *espice* (meaning "seasoning"), and it was the 18th-century French botanist Pierre Poivre who broke the Dutch stranglehold on clove and nutmeg with smuggling raids to the Moluccas Spice Islands. Indeed, it's hard to imagine a classic Dauphinoise potato without the warmth of nutmeg, Provençal cookery without the aniseedy notes of fennel, or innumerable French dishes without garlic or Dijon and Bordeaux mustards.

“

*French cooking tends to draw heat from garlic and pepper, but chilis feature in Basque and Provençal dishes.*

”

### LOCAL SPICE BLEND

#### *Quatre épices*

This “four spices” mix is often used to season terrines. Proportions can be tweaked and, confusingly, cinnamon added as a fifth spice.

- 1 tbsp** white peppercorns
- 1 tsp** cloves
- 1 tsp** ground nutmeg
- 1 tsp** ground ginger

Grind the whole spices and combine with the nutmeg and ginger. To make a mix for sweet pastries, replace the white pepper with allspice or cinnamon.

### LOCAL SPICE BLEND

#### *Paella mix*

Saffron and *pimentón* are essential to the flavor of paella, Spain's versatile rice-based dish.

- 2** pinches of saffron
- 3 tbsp** *pimentón* (a mixture of smoked and sweet)
- 2 tsp** garlic powder
- 2 tsp** onion powder
- 1 tsp** cayenne pepper
- 1 tsp** ground black pepper
- 1 tsp** dried oregano
- 1/2 tsp** dried parsley
- 1/2 tsp** ground cloves
- 1/2 tsp** ground cumin

Grind the saffron threads using a pestle and mortar, and combine with the remaining ingredients. Makes approximately 6 tablespoons.





# SPAIN AND PORTUGAL

*Smoky | Sweet | Piquant*

*Arab conquerors from North Africa first introduced saffron cultivation to the Iberian peninsula in the 8th century.*

Brought back from the Americas by Columbus in the late 1400s, sweet and chili peppers are inescapable in this region. Spanish cooks often reach for the mildness of *pimentón*, while the Portuguese brave the heat of malagueta chilis. Dried nora peppers are essential to the Catalan romesco sauce for fish, and green *guindilla* chilis are used in a hot sauce from the Canaries. Saffron abounds in Andalusian cuisine and the Valencian classic, paella, while cinnamon laces sweet Portuguese dishes.

Spice mix and ingredients ready for paella, see p.213. ▼

## SPICE PALETTE



*Pimentón*



*Piri piri chili*

### Signature

#### **Pimentón, chili (malagueta)**

Spain's vivid red *pimentón* (paprika) comes in three varieties: *dulce* (sweet), *agridulce* (bittersweet), and *ahumado* (smoked). Hot malagueta chilis are popular in Portuguese stews and other meat dishes.

### Supporting

#### **Pimentón picante, dried nora peppers, chili (piri piri), garlic, saffron**

Pungent *pimentón picante* is less popular than its milder variants, but makes a regular appearance in the Canaries and Galicia. Piri piri is used interchangeably with malagueta in Portugal.

### Supplementary

#### **Dried choricero peppers, chili (guindilla, alegrías), cacao, anise, cloves, cinnamon**

Cacao nibs are occasionally used in game and beef stews. Fragrant anise is paired with chestnuts in Portugal and with dried figs in Catalonia.





**SPICE  
PALETTE**

vanilla



fennel



black pepper

*Signature***Chili (*peperoncino*), black pepper, fennel**

Hot peppers have long been popular in southern Italy, although their appeal is increasingly spreading north. More than anywhere else in Europe, black pepper transcends being a mere seasoning in Italy.

*Supporting***Coriander, nutmeg, garlic, saffron, clove, vanilla**

Coriander seeds are a popular flavoring for meat dishes, and it can seem as if almost every Italian cheese dish features nutmeg.

*Supplementary***Ginger, cacao, licorice, cinnamon, anise**

Ginger is used sparingly, while cacao nibs may feature in the sweet and sour *agrodolce* sauce. Calabrians pair licorice with game and also use it to flavor liqueurs.



► Penne pasta with *arrabiata* sauce, Parmesan, and fresh basil.

**ITALY***Punchy | Rustic | Warming*

Italy played a key role in the story of spice when the Republic of Venice dominated the trade from the 8th to 15th centuries. Today, varied regional palettes reflect Italy's history as a collection of separate states, but fennel, nutmeg, and saffron are popular countrywide for flavoring meats, cheeses, pasta dishes, and risottos. The fiery food of Calabria uses the hot *peperoncino* chili to spice cheese, salami, and oil. Cloves, too, are prevalent both in sweet dishes—the compact Sienese *panforte* tart, for instance—and in rustic savory ones.

**LOCAL SPICE BLEND***Arrabiata sauce*

Translating as “angry,” this quick pasta sauce gets its fiery reputation from liberal quantities of chili and black pepper.

**1 tbsp** hot red chili flakes**1 tsp** dried oregano**1 tsp** garlic powder**1 tsp** salt**1 tsp** ground black pepper**1 tbsp** olive oil**1½ oz (50 g)** cubed pancetta**1** onion, finely chopped**2 (14.5 oz)** cans chopped tomatoes

Combine the first five ingredients and set aside. Heat the oil and fry the pancetta and onion for 5 minutes. Add the spice mix and tomatoes, and simmer for 10 minutes. Serve with penne pasta.



## SOUTHEAST EUROPE

*Unusual | Earthy | Generous*

The food of these eastern Mediterranean and former communist states is far from spice heavy, and Greek food in particular tends to favor herbal flavoring. That said, Hungarian paprika (introduced by the Turks in the 17th century), and Georgian blue fenugreek represent two of Europe's most distinctive flavors. Chilis appear often in Balkan cooking, but rarely for heat; what warmth there is tends to come from black pepper. Caraway is often paired with cabbage in Hungary and occasionally with fish in the Balkans, and cinnamon is popular in Romania. The food of Cyprus is often laced with coriander seeds and, unusually, pinelike mastic.

*Peperino is a peppery cookie from Venice dating from the city's heyday as the European center of the spice trade.*

### LOCAL SPICE BLEND

#### *Khmeli-suneli*

Universally popular in Georgia, *khmeli-suneli* is used as a meat rub or in hearty stews, although it is highly palatable sprinkled on almost anything.

- |                                     |                              |
|-------------------------------------|------------------------------|
| <b>1 tbsp</b> coriander seeds       | <b>½ tsp</b> chili powder    |
| <b>1 tsp</b> black peppercorns      | <b>2 tbsp</b> dried marigold |
| <b>2</b> dried bay leaves           | <b>2 tbsp</b> dried savory   |
| <b>1 tbsp</b> blue fenugreek leaves | <b>2 tbsp</b> dried marjoram |
| <b>1 tbsp</b> blue fenugreek seeds  | <b>1 tbsp</b> dried mint     |
| <b>1 tsp</b> garlic powder          | <b>1 tbsp</b> dried dill     |
|                                     | <b>1 tsp</b> dried hyssop    |

Grind the whole spices and combine with the rest of the ingredients.

### SPICE PALETTE



*blue fenugreek*



*paprika*

#### *Signature*

**Blue fenugreek, black pepper, paprika**

Blue fenugreek, almost exclusively used in Georgian cuisine, tastes a little like hay and burned sugar. Both seeds and pods are ground to a powder.

#### *Supporting*

**Cinnamon, caraway, fennel, chili**

As well as providing the warm spice notes of Greek moussaka, cinnamon features heavily in Romanian cookery, which is otherwise spice light. Caraway is sometimes added to the Greek orange-flavored *loukaniko* sausage.

#### *Supplementary*

**Dill, carob, vanilla, mastic**

Dill seeds are often paired with fish in Eastern Europe. Carob is popular as an alternative to chocolate, and is used in Greek carob cake; Hungarian creams and cakes are often infused with vanilla.



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# **SPICE** | *profiles*

*Discover all you need to know about the world's top spices  
with in-depth science and practical advice, and begin  
your culinary adventure with innovative recipes.*



# CINNAMON

*Sweet | Aromatic | Warm*

**BOTANICAL NAME**

*Cinnamomum verum*

**ALSO KNOWN AS**

Ceylon cinnamon, “true” cinnamon

**MAJOR FLAVOR COMPOUND**

Cinnamaldehyde

**PARTS USED**

Dried bark of tender shoots

**METHOD OF CULTIVATION**

Trees are coppiced at 18–24 months of age and the stump covered, causing it to grow like a bush. New shoots are removed at the base and stripped for their bark.

**COMMERCIAL PREPARATION**

Inner layers of bark are dried in the sun and rolled together by hand into long “quills,” which are graded and cut.

**NON-CULINARY USES**

In perfumery and as a natural antiseptic.

**The plant**

Cinnamon is a small evergreen tree in the laurel family, found in the wild growing in wet tropical forests.

**Young shoots**  
are harvested  
for their bark  
every two years


**Powder**

Ground spice quickly loses its flavor. Buy it in small quantities, keep in an airtight container in a cool, dark place, and use within 6 months.

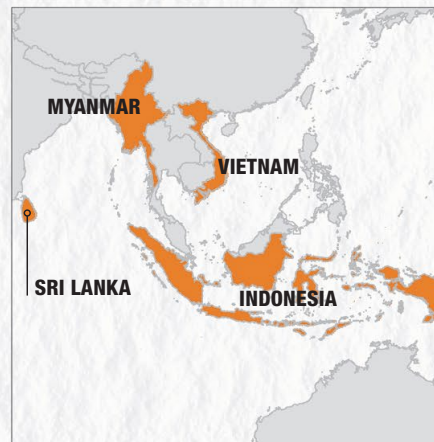
**Whole**

Cinnamon sticks will keep their flavor for up to a year. Lighter brown, thinner, more fragile sticks are higher quality.



## Spice story

From 1600 BCE, ancient Egyptians used a type of cinnamon for incense and as an embalming spice, importing it from Asia via African traders. It is not known for certain whether this was cinnamon from Sri Lanka or Chinese cassia. From the 8th century CE, Arab merchants dominated the trade and invented tall tales to protect their sources and high prices. In one such myth, giant birds were said to gather the bark from an unknown land, using it to make nests on high cliffs, and the only way to collect it was to lure the birds away with large pieces of meat. The real source remained a mystery to Europeans until the Portuguese found cinnamon trees growing in Sri Lanka in the early 1500s, and promptly occupied the island. They in turn were ousted by the Dutch, who then fought the British for centuries over control of the territory and lucrative trade.


**Region of cultivation**

Cinnamon is native to the island of Sri Lanka and is now also notably cultivated in Myanmar, Vietnam, Indonesia, and the islands of the Seychelles off the coast of East Africa.

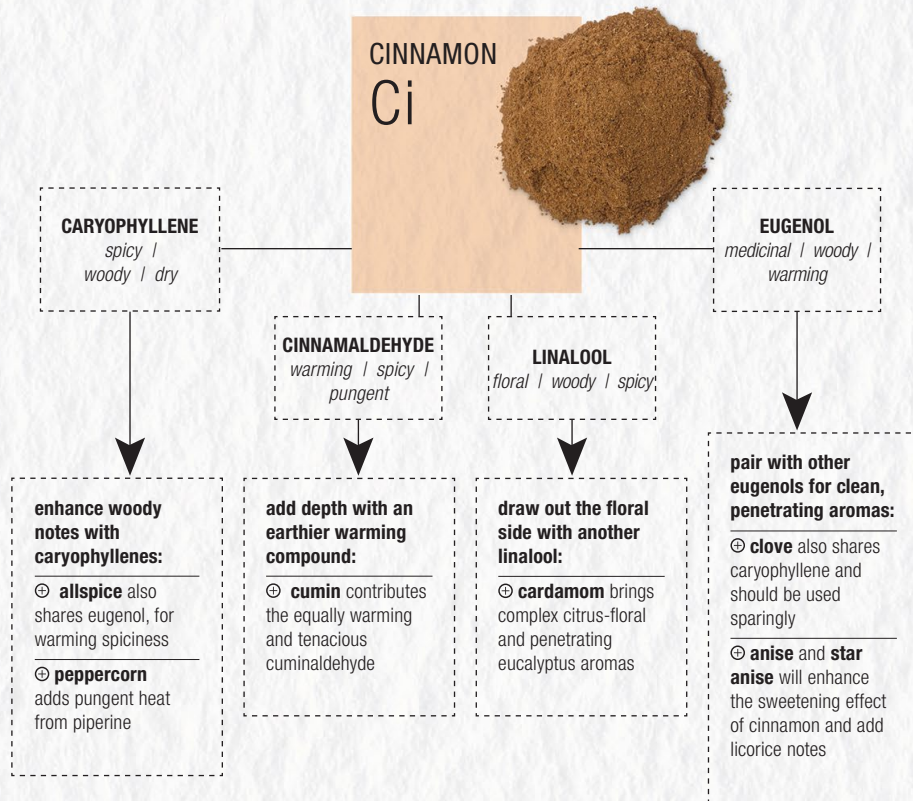


## Kitchen creativity

Cinnamon does not in itself taste sweet, but rather it enhances the perception of sweetness in other ingredients. This makes it perfect for sweet pastries and desserts, and for drawing out sweet notes in savory dishes.

### BLENDING SCIENCE

Cinnamaldehyde is the main flavor compound and is sensed by temperature receptors on the tongue, giving cinnamon a warming quality that makes it a good partner for other warming spices. Make further connections through the woodiness of caryophyllene, the penetrating aroma of eugenol, and the floral notes of linalool.



### FOOD PARTNERS

- ⊕ **Fruit** Mix cinnamon powder with sugar and sprinkle over peaches, figs, apples, and pears before baking or grilling, or add to the batter for a plum or cherry clafoutis.
- ⊕ **Sweet baked goods** Use ground cinnamon to flavor Nordic buns, Italian *panforte*, or French *pain d'épices*.
- ⊕ **Tomatoes and eggplants** A cinnamon-infused tomato sauce makes an excellent topping for baked eggplants.
- ⊕ **Red meats** Add a stick or two to a lamb tagine, an Iranian *khorek* beef stew, or the stock of a fragrant Vietnamese beef *pho* noodle soup.
- ⊕ **Pigeon** Cinnamon is the main flavoring in Moroccan *pastilla* pigeon pie with phyllo pastry.

### BLENDS TO TRY

Use and adapt these recipes for classic blends featuring cinnamon:

- Advieh** p.27
- Burmese garam masala** p.48
- Jamaican jerk rub** p.64
- Mole mix** p.65
- Mulling spice** p.73

### RELEASE THE FLAVOR

The taste components in cinnamon need time to escape from its woody matrix, and the critical flavor compound, cinnamaldehyde, does not dissolve in water.



**Add early in cooking** to give flavors time to suffuse the dish.



**Fat and alcohol** will help disperse cinnamaldehyde.



**Steam** is also a carrier of cinnamaldehyde, so boil vigorously with a lid on the pan.



# CASSIA

*Sweet | Peppery | Astringent*

## BOTANICAL NAME

*Cinnamomum cassia*, *C. loureirii*, *C. burmannii*

## ALSO KNOWN AS

Chinese cinnamon (*C. cassia*), Vietnamese/  
Saigon cinnamon (*C. loureirii*), Indonesian/  
Java/Korintje cinnamon (*C. burmannii*)

## MAJOR FLAVOR COMPOUND

Cinnamaldehyde

## PARTS USED

Dried bark, unripe fruits (“buds”)

## METHOD OF CULTIVATION

The bark is harvested every second year in the monsoon season from trees that are at least four years old.

## COMMERCIAL PREPARATION

Strips of inner bark are dried in the sun and curl up naturally, forming thick shards; buds are dried.

## NON-CULINARY USES

In perfumes; in Chinese medicine to treat diarrhea and dyspepsia.

### The plant

Cassia comes from an evergreen tree in the laurel family, and is closely related to cinnamon.

Leaves and buds are also aromatic, unlike “true” cinnamon

Bark is coarse and grayish brown



### Buds

The dried unripe fruits resemble cloves and are used in the Far East as a pickling spice.

### Bark

The bark is darker, thicker, more loosely coiled, and harder to snap than that of cinnamon. It carries a stronger aroma and more intense flavour.



## Spice story

Cassia was used for medicinal purposes in ancient China from 2700 BCE, and was among the first spices to reach the Mediterranean via the ancient trade routes. The Egyptians used cinnamon as a culinary spice and for its health properties, but it is unclear whether they used cinnamon or cassia. Persians knew cassia and cinnamon as *darchini*, and used them in savory and sweet dishes. By the 5th century BCE, cassia had been identified as distinct from cinnamon. Medieval English and French cookbooks referred to cassia and cinnamon as “canella,” but cassia’s coarser flavor saw its status demoted: in his 15th-century book of manners, *Book of Nurture*, John Russell wrote that “Synamone is for lords, canelle for common people.” Today, cassia accounts for nearly 50 percent of the world’s cinnamon supply, and is a key spice in China and Southeast Asia. It is popular in North America, where most “ground cinnamon” is actually cassia.



### Region of cultivation

Cassia is native to the wet tropical forests of southern China. It is cultivated across southern and eastern Asia, but mainly in southern China and Vietnam.

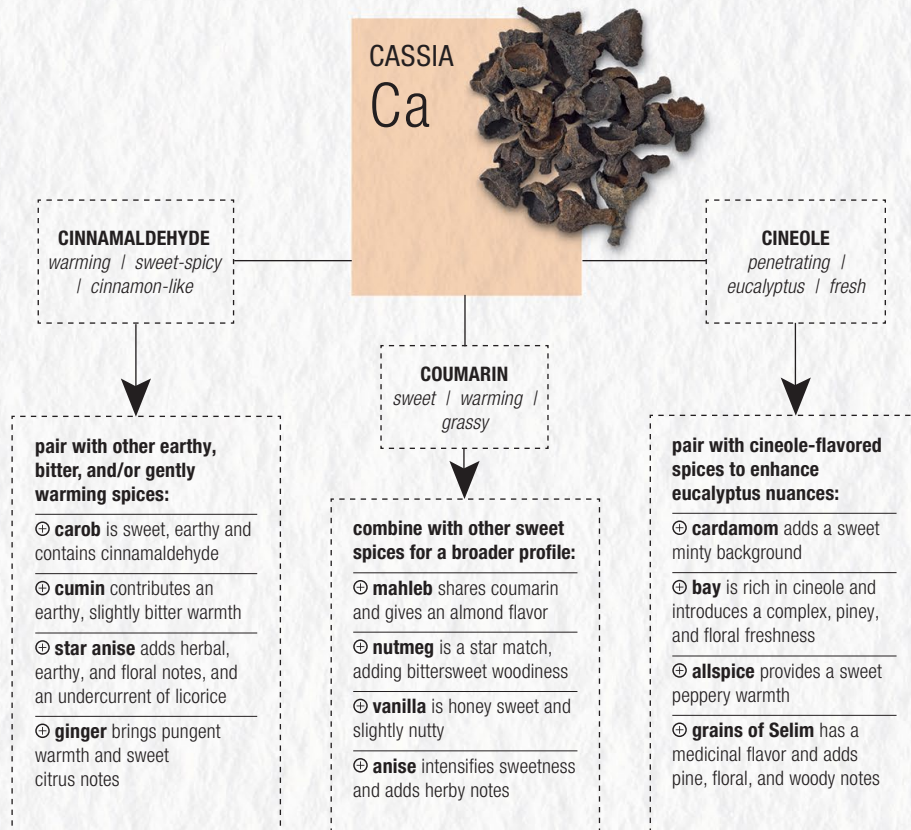


## Kitchen creativity

Cassia has a sweet, warming taste, but is bitter and lacks the floral, citrus notes of cinnamon. Its deeper, spicier, less subtle flavor is best suited to robustly flavored savory dishes, although the spice can be used in sweet baking.

### BLENDING SCIENCE

Cassia's flavor profile is dominated by cinnamaldehyde, the compound that gives cinnamon and cassia their recognizable taste. Tannins, which give a mouth-puckering astringency, are also present and it contains coumarin, a phenol absent in "true" cinnamon, as well as eucalyptus-scented cineole.



### FOOD PARTNERS

- ⊕ **Beef, pork** Include a piece of cassia bark with other warming spices in an Italian beef or oxtail ragu, beef rendang, or pork vindaloo.
- ⊕ **Pulses, grains** Add a piece of cassia bark to the base aromatic ingredients for a pilaf, dhal, or curry.
- ⊕ **Baking** Create the unmistakable aroma of American iced cinnamon rolls by using ground bark; add ground buds to Christmas confections, fruit cake, and spiced cookie dough.
- ⊕ **Preserves** Infuse cucumber pickling brine, tomato chutney, or a barbecue sauce with cassia buds.

### BLEND TO TRY

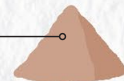
Use and adapt this classic blend featuring cassia:

**Garam masala** p.40

#### Coumarin caution

Sweet-tasting coumarin can cause temporary liver damage if consumed in excessive amounts. Regular consumers of cinnamon-flavored foods should therefore choose "true cinnamon" rather than cassia.

Children  
1/8 oz (3.5g)



Adults  
1/4 oz (7g)



**Medical authorities** have recommended maximum weekly quantities of cassia, above which it should not be consumed for a long period.

### RELEASE THE FLAVOR

Most flavor compounds in cassia, including dominant cinnamaldehyde, do not dissolve in water and can struggle to escape from woody bark's matrix.



Cassia bark is best ground in an electric grinder

**Grind cassia** just before use to minimize the loss of flavor oils by evaporation.



**Include fats** and/or alcohol in a dish to help disperse flavor compounds.



**Steam disperses** cinnamaldehyde, and a water-based dish can be infused with flavor if boiled in a lidded pot.



# CLOVE

*Sweet | Astringent | Camphorous*

## BOTANICAL NAME

*Syzygium aromaticum*

## ALSO KNOWN AS

Nail spice: the common name in many languages translates as “nail spice” due to its shape.

## MAJOR FLAVOR COMPOUND

Eugenol

## PARTS USED

Flower bud

## METHOD OF CULTIVATION

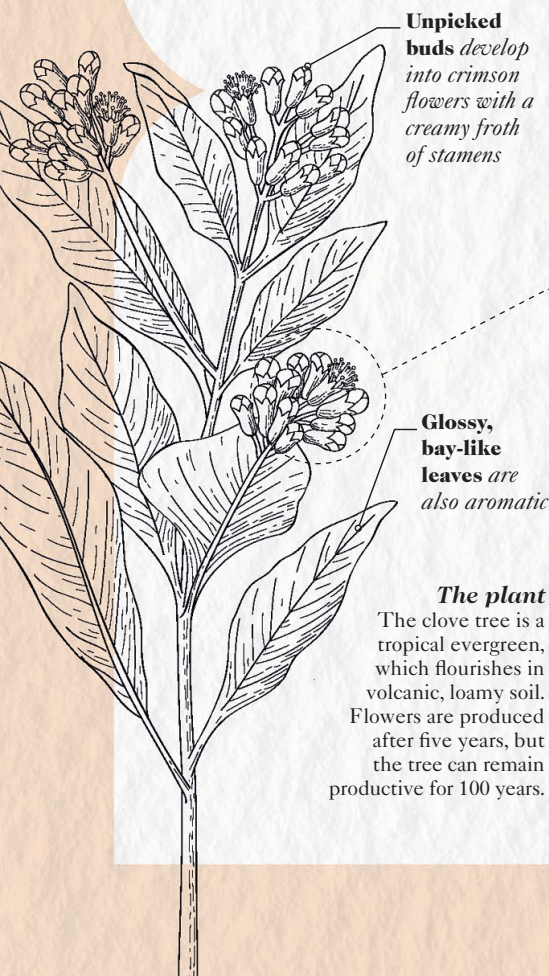
Twice a year, the flower buds are picked by hand when they have just turned pinky-red and are almost ready to open.

## COMMERCIAL PREPARATION

The buds are dried in the sun until they turn dark brown and harden.

## NON-CULINARY USES

To flavor *kretek* cigarettes in Indonesia; in some dental products; and to treat nausea, indigestion, and inflammation.



## Whole

Look for cloves that are plump, not shriveled or broken, and where the majority retain their rounded tops. Test for quality by pressing the “stem” with a fingernail: oil should ooze out.

## Powder

Ground cloves quickly lose their flavor, and it is better to buy whole cloves and grind as required. Twelve whole cloves are roughly equivalent to a teaspoon of ground.



## Spice story

The Moluccas (now Maluku) of Indonesia were once renowned as the Spice Islands thanks to a trio of indigenous spices—cloves, nutmeg, and mace—which were cultivated there, and nowhere else, for almost two millennia. Courtiers addressing the Emperor during the Chinese Han dynasty (206 BCE–220 CE) used cloves to sweeten their breath, and the Romans, who named the spice *clavus* (Latin for nail), used it as an incense and perfume. In the Middle Ages, clove took off as a culinary spice in the West. At first the Republic of Venice had a virtual monopoly of the lucrative trade, but the Portuguese, Dutch, Spanish, and English fought a series of wars to seize control, with the Dutch eventually winning out. In the 18th century, Frenchman Pierre Poivre managed to smuggle clove seedlings to Mauritius.



## Region of cultivation

Indonesia is still the largest producer of cloves, although most of the crop is used by the local *kretek* cigarette industry. Other major producers are Madagascar and Tanzania, with lesser amounts from India, Sri Lanka and Pakistan.

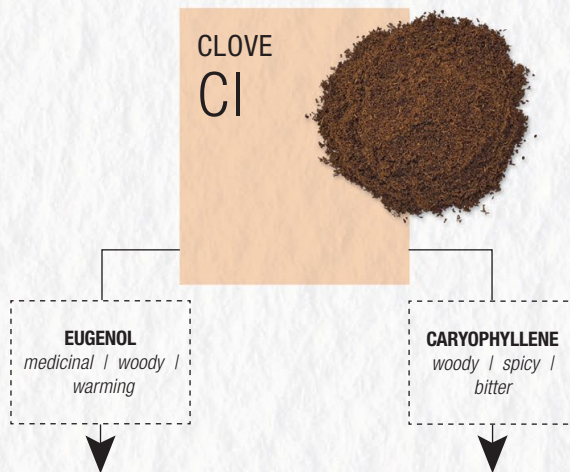


## Kitchen creativity

Clove's powerful flavor is usually tamed by blending it with other similarly warming spices to soften its dominance. Antiseptic properties make it a common spice for pickling, but use sparingly.

### BLENDING SCIENCE

Clove has the highest eugenol content of any spice; this perfumed, warming phenol compound has a eucalyptus-like scent and a sweetening effect on the tongue. Woody caryophyllene is the other compound useful for pairing, and the flavor profile is rounded off with green banana-like methyl amylketone and minty methyl salicylate.



#### pair with other warming spices that contain some eugenol:

- ⊕ **allspice** provides a sweet, peppery warmth
- ⊕ **licorice** contributes sweetness and eucalyptus-like notes
- ⊕ **nutmeg** or **cinnamon** used sparingly add warm spicy notes
- ⊕ **bay leaf** and **fenugreek** offer excellent savory pairings

#### draw out the spicier side with more caryophyllene-carrying spices:

- ⊕ **grains of paradise** bring a peppery warmth and penetrating spiciness
- ⊕ **black pepper** lends warmth as well as woody notes
- ⊕ **cacao** adds rich, roasted, bitter flavors

### FOOD PARTNERS

- ⊕ **Tomatoes and red cabbage** Add a pinch to tomato sauce or when braising red cabbage.
- ⊕ **Peaches** The fruit shares eugenol, making it a natural partner. Preserve in a sugar syrup infused with cinnamon, fresh ginger, and whole cloves (2–3 per peach).
- ⊕ **Beef and pork** Season a beef stew, pork braise, or classic French *pot-au-feu* with a few whole cloves, or use them in the masala for a Keralan beef curry.
- ⊕ **Milk** Add a clove or two to milk before scalding it to make a white sauce or an Indian *kheer* or *payasam* pudding.
- ⊕ **Hot drinks** Infuse tea or coffee with a whole clove for sweetness without the calories. Cloves are also an essential aromatic in mulled wine or cider.

### BLEND TO TRY

Try these recipes for classic blends featuring clove, or why not adapt them with some blending science?

*Pilau masala* p.34

*Vindaloo paste* p.44

*Finnish gingerbread spice* p.72

### RELEASE THE FLAVOR

Clove's main flavor compounds, eugenol and caryophyllene, are oil based. They evaporate very quickly once released, and barely dissolve in water.



**Use whole** cloves or grind just before adding to the recipe.



**Add early** to give ample time for the flavor to diffuse out of the woody matrix.



*Alcohol*

*Oil*

**Some oil/fat** and/or alcohol is needed to distribute the flavor compounds.



# ALLSPICE

*Warm | Peppery | Sweet*

## BOTANICAL NAME

*Pimenta dioica*

## ALSO KNOWN AS

Jamaican pepper, clove pepper, pimento

## MAJOR FLAVOR COMPOUND

Eugenol

## PARTS USED

Dried berries; occasionally fresh leaves

## METHOD OF CULTIVATION

Twigs bearing bunches of berries are handpicked from trees in summer, when the berries are mature but still green.

## COMMERCIAL PREPARATION

Berries are “sweated” (see vanilla curing, p.100) and then dried for several days in the sun, or artificially, before being picked.

## NON-CULINARY USES

Essential oil in perfumes and cosmetics; flavoring agent in medicines; pesticide and fungicide; antiseptic and digestive aid.

### The plant

Allspice is an evergreen tree in the myrtle family. It starts fruiting by the age of 7 or 8 years, and continues for up to 100 years.

**Berries ripen to dark purple if left on the tree, but lose most of their aroma**

**Glossy leaves are used in the Caribbean for stuffing meat**

### Powder

Ground allspice quickly loses its potency. Buy in small quantities and keep sealed in a cool, dark place for up to 6 months.

### Whole

The dried berries retain their flavor well and will keep almost indefinitely sealed in a cool, dark place.

**Rough surface contains tiny oil glands**

**Most flavor is concentrated in the wrinkled husk (or “pericarp”), not the seeds**



## Spice story

The Mayans of Central America were using allspice from at least 2000 BCE to embalm their dead, alleviate arthritis, and flavor chocolate beverages, while the indigenous peoples of the Caribbean used it to preserve meat and fish. Christopher Columbus was the first European to encounter the spice, in Jamaica in 1494, but mistook it for a variety of pepper, hence its Spanish name *pimento*. From the outset, Europeans were enamored of its preservative powers, and the spice is used as a preservative in the Scandinavian fishing industry to this day. When Russia was invaded by Napoleon in the early 19th century, the Russian troops crushed allspice berries inside their boots to ward off bacterial and fungal foot infections.



### Region of cultivation

Native to the West Indies, Mexico, and Central America, allspice is mainly cultivated in Jamaica, but also in Honduras, Mexico, Guatemala, Hawaii, and Tonga.

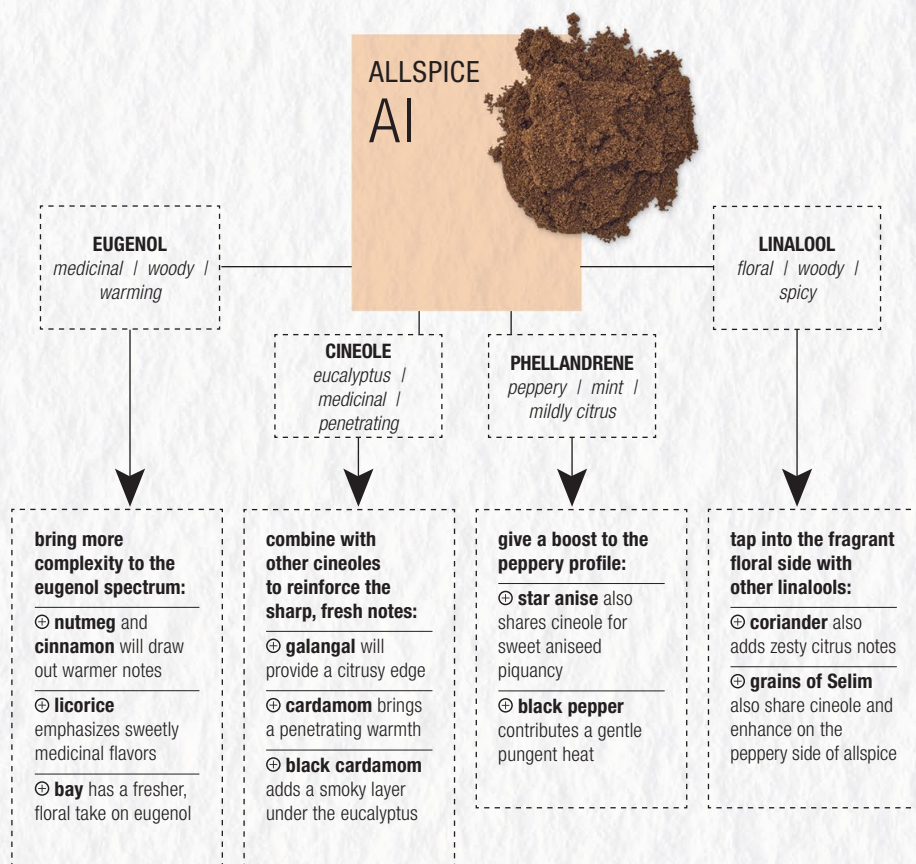


## Kitchen creativity

True to its name, this full-bodied, versatile spice suits both sweet and savory dishes, and blends comfortably with other spices. Allspice forms the backbone of Jamaican cuisine and is a key component of jerk seasoning.

### BLENDING SCIENCE

Allspice pairs with other spices that share the phenolic compound eugenol, which carries a strongly medicinal aroma. Other cineole-bearing spices with a eucalyptus-like, penetrating quality also pair well. Lesser amounts of the lighter terpenes phellandrene, linalool, myrcene, and pinene round off the taste profile.



### FOOD PARTNERS

- ⊕ **Raw fish** Combine with mustard seeds as a pickling spice for raw fish, such as herring, or in Mexican *escabeche*.
- ⊕ **Sweet vegetables** To bring out the natural sweetness in vegetables, try it in a tomato sauce or soup, a beet *borscht*, or puréed sweet potato.
- ⊕ **Red meats** Stir ground spice into beef stews (particularly tomato-based) and pork or game pâté mixtures.
- ⊕ **Stone fruit and rhubarb** Sprinkle a pinch of ground allspice into the pan when poaching plums, apples, pears, or rhubarb.
- ⊕ **Sweet baked goods** Add a pinch to biscuit dough, ginger cake, milk puddings, or steam puddings.

### BLENDS TO TRY

Try these recipes for classic blends featuring allspice, or why not adapt them with some blending science?

**Arabic baharat** p.26

**Jamaican jerk rub** p.64

**Mulling spice** p.73

### RELEASE THE FLAVOR

Extra layers of smoky, roasted aromas from pyrazines can be created by cracking and toasting the whole spice before grinding.

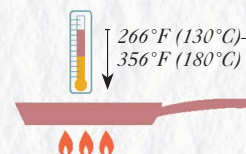


**Before toasting**, crush the berries lightly in a pestle and mortar to crack the shells.



Flavor compounds are concentrated in the shell

**Cracking** the shells helps to release the flavor oils, which are stored in tiny glands.



**Toast** in a dry frying pan. New flavor compounds, such as pyrazines, form above 266°F (130°C), but at 356°F (180°C) burned flavors dominate.



# ANISE

*Camphorous | Sweet | Warming*

**BOTANICAL NAME**

*Pimpinella anisum*

**ALSO KNOWN AS**

Aniseed, sweet cumin, white anise

**MAJOR FLAVOR COMPOUNDS**

Anethole, anisyl alcohol

**PARTS USED**

Fleshless fruits housing small seeds

**METHOD OF CULTIVATION**

Grown as an annual crop, plants are pulled up or mown when the fruits ripen.

**COMMERCIAL PREPARATION**

Fruits are left to dry for a week, then threshed to separate the flower heads.

**NON-CULINARY USES**

The essential oil is used in cough medicine, perfumes, and soaps. Also known as a traditional remedy for gas and headaches.

**The plant**

Anise is a frost-sensitive, non-woody plant. The flowers bloom in midsummer, and develop into ripe fruits a month or two later. Anise thrives in a light, alkaline soil.

**Small flowers** are yellow-white and clustered in umbels

**Fern-like leaves** have a subtle flavour and can be used as a herb

**Seeds** often retain bits of stalk, but excessive stalk indicates sub-standard quality

**Check that** seeds are free of dust

**Whole**

The brown-green oval seeds are best bought whole and ground as required. Seeds will keep for up to two years in a sealed container. Wild black anise from Calabria in Italy is sweeter and less bitter than standard anise, but much harder to source.

## Spice story

Records show ancient Egyptians using anise as a cure for snake bites, but it was the Romans who really developed a fondness for its intensely sweet, licorice-like taste, drawing on anise to flavor everything from the provisions of a lowly centurion to the spiced wine, *conditum*, and rich cake, *mustaceoe*, served at special banquets. Anise endured as a popular kitchen garden plant into the Middle Ages, especially in the Pyrenees, where monks produced an anise-flavored liqueur that the French drank as an aperitif and also added to stews and stocks. Today, several liqueurs are still flavored with anise's essential oil, including French *pastis*, Greek *ouzo*, Turkish *raki*, and Arab *arrak*. Anise has also long been regarded as an effective aid to digestion; in India today the fruits are commonly chewed whole after meals.


**Region of cultivation**

Anise is cultivated widely in its native region of the eastern Mediterranean, Egypt, and the Middle East, and commercial crops are now grown as far afield as the Baltic countries and Latin America. Cultivation has also spread east to India, China, and Japan.

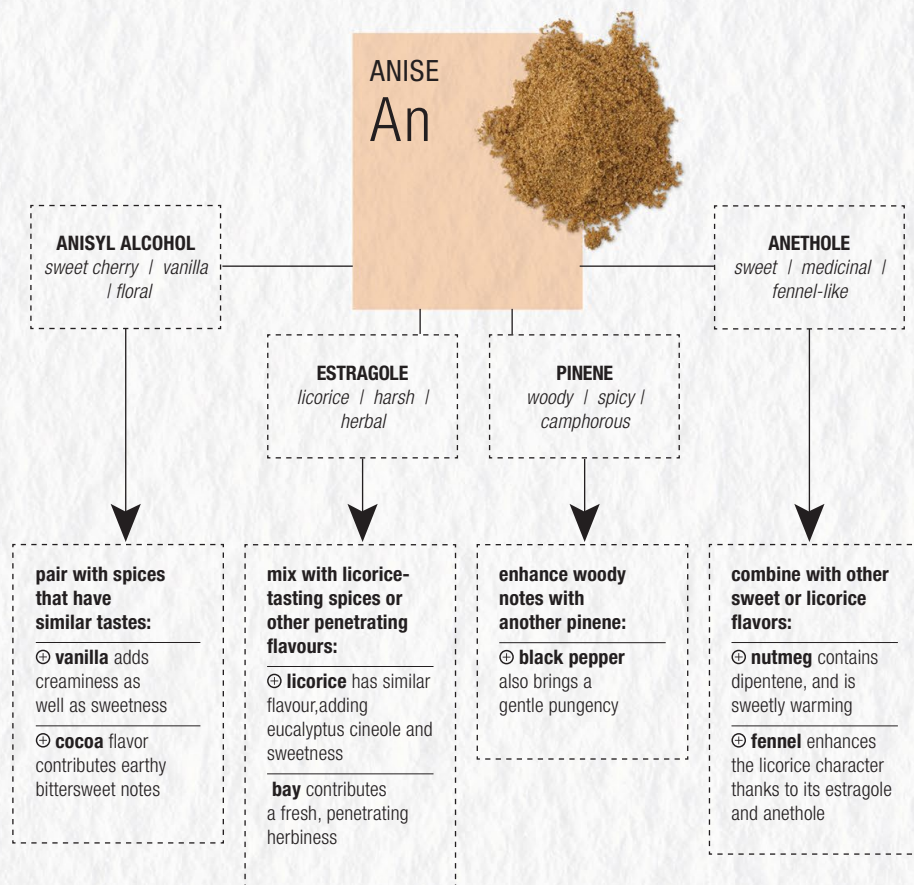


## Kitchen creativity

Anise is most frequently used to flavor sweet baked goods, but has many savory uses as well. Anise and fennel seeds are largely interchangeable in Asian cooking. If using an anise-based liqueur, add the lightest drizzle to avoid overwhelming a dish.

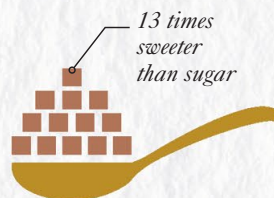
### BLENDING SCIENCE

The unmistakable herby licorice flavor of anise derives from the powerful anethole compound. Spice pairings can be made through the other, more subtle compounds—anisyl alcohol for its hints of cherry, vanilla, and chocolate, as well as estragole and traces of pinene and limonene.



### The sweetness compound

Anethole comprises up to 90 percent of the flavor oils in anise and conveys the spice's licorice flavor. The compound also excites the sweetness receptors on human taste buds, making it sweeter than sugar—but without the calories. It is no surprise, then, that anise has long been the spice of choice for flavoring sweet candies and liqueurs, especially before the ready availability of sugar.



### FOOD PARTNERS

- ⊕ **Celeriac** Add ground anise to a rich dressing for celeriac remoulade.
- ⊕ **Potatoes** Fry chopped onions with whole anise, curry leaves, and mustard seeds to flavor a potato and pea curry.
- ⊕ **Fish** Stir a teaspoonful into a South Indian-style coconut fish soup or tomato-based Mediterranean fish stew.
- ⊕ **Pork** Add the toasted seeds to sausage meat used for meatballs or stuffing.
- ⊕ **Fruit** Incorporate the seeds into a sweet pastry dough for a lemon, quince, or apple tart, or fry them in a batter for apple or banana fritters.

### RELEASE THE FLAVOR

Anethole dissolves in alcohol and oil but not in water. Fry gently in oil or other fats before mixing into the rest of the dish, or use alcohol (e.g. from rice wine or fermented soy sauce) in a liquid-based dish to disperse.



### BLENDS TO TRY

Try these recipes for classic blends featuring anise, or why not adapt them with some blending science?

**Burmese garam masala** p.48

**Shandong spice bag** p.58

**Nanjing spice bag** p.59



# STAR ANISE

*Licorice* | *Sweet* | *Warm*

## BOTANICAL NAME

*Illicium verum*

## ALSO KNOWN AS

Chinese anise, badian anise, Siberian anise

## MAIN FLAVOR COMPOUND

Anethole

## PARTS USED

Seed pods, seeds

## METHOD OF CULTIVATION

The fruits are harvested before they ripen, from late summer through early winter.

## COMMERCIAL PREPARATION

The fruits are dried, typically in the sun, until hard and woody and the pods' points have split to expose the seeds.

## NON-CULINARY USES

In soaps, perfumery, and cough mixtures; in Chinese medicine for stomach pain, headaches, and rheumatism.

### The plant

Star anise is the fruit of a small Chinese evergreen tree, closely related to magnolia. Trees can bear fruit for 100 years or more.

Leaves are large, fragrant, and waxy, forming in bunches

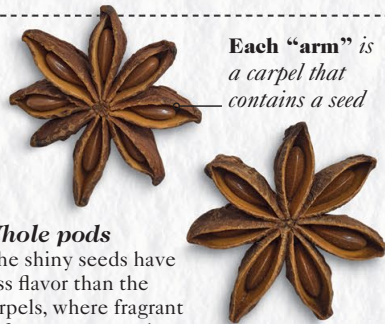
Narcissus-like flowers turn yellow just before fruiting.

Whitish trunk is aromatic.



### Ground

The seeds and woody carpels are used to make the ground spice. The flavor compounds evaporate fast, so it does not stay fresh for long.



Each "arm" is a carpel that contains a seed

### Whole pods

The shiny seeds have less flavor than the carpels, where fragrant defense compounds are concentrated.

## Spice story

Star anise's Latin name *Illicium* means "allurement," referring to its sweet smell and pretty shape. It has been cultivated for more than 3,000 years for culinary and medicinal use in its native China and Vietnam. It symbolizes good fortune in Chinese culture, where finding a star with more than the normal eight arms is considered very good luck. From the late Middle Ages it was traded along the tea route from China via Russia, and for much of this time it was known as Siberian cardamom. Due to the relatively high price of anise, and the increasing popularity of Asian cooking, star anise has never been more widely used than it is today. Indeed, shortages have occurred during international flu outbreaks because star anise contains shikimic acid, a chemical used to make the antiviral drug Tamiflu.



### Region of cultivation

Native to southwest China and northeast Vietnam, star anise is cultivated in China, India, Laos, Vietnam, the Philippines, Japan, and Taiwan.

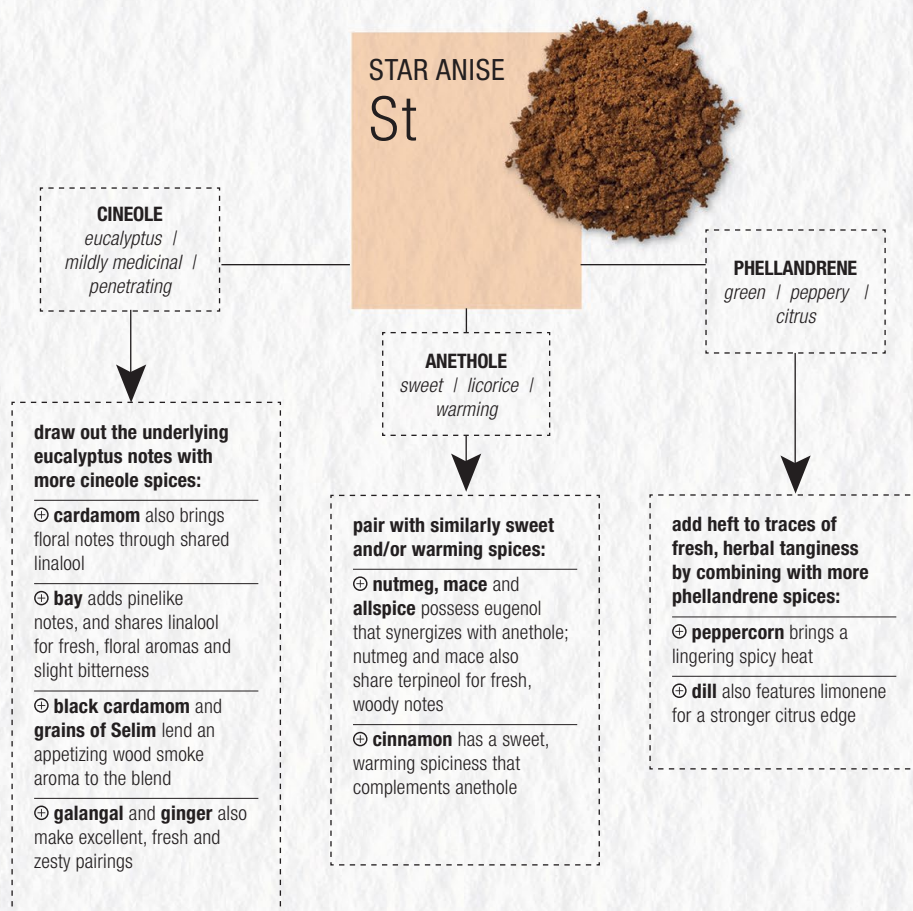


## Kitchen creativity

Star anise is essential to Chinese cuisine and indispensable to five-spice powder. In South India, it may be added to a biryani and used in versions of garam masala. Vietnamese *pho* would be incomplete without its distinctive flavor.

### BLENDING SCIENCE

Star anise shares the anethole flavor compound with anise, fennel, and licorice, even though they are from unrelated plants. Anethole is 13 times sweeter than table sugar, and gives the spice its sweetness. The overall flavor profile is more complex than that of other anethole spices, and features linalool's alluring floral flavor.



### FOOD PARTNERS

- ⊕ **Vegetables** Add a pod to braised leeks, cabbage, or fennel; sprinkle the ground spice over pumpkin, root vegetables, and swede before roasting; or add a pinch to sweet vegetable purées.
- ⊕ **Rice** Put a whole pod in the pan when cooking basmati or sticky Thai rice—its delicate, sweet flavor complements biryanis and pilaus.
- ⊕ **Beef, pork** Use the whole spice to add freshness to an oxtail stew, or add to Chinese slow-braised pork.
- ⊕ **Seafood** Mix star anise, ginger, and peppercorns in the saucepan before adding clams or mussels and wine or a splash of sherry or Pernod for a Vietnamese-style dish.
- ⊕ **Fruit preserves** Combine with quince, figs, apples, apricots, and tropical fruits such as pineapple and mango to add a fresh licorice taste.

### BLENDS TO TRY

Try these recipes for classic blends featuring star anise, or why not adapt them with some blending science?

**Vindaloo paste** p.44

**Burmese garam masala** p.48

**Shandong spice bag** p.58

**Nanjing spice bag** p.59

**Five-spice powder** p.60

### RELEASE THE FLAVOR

Much of the flavor is locked up in the hard carpels of the pods, which protect the seeds and contain concentrated flavor compounds that evolved to repel pests. There are various ways to release and enhance that distinctive flavor.



**Toast** at 266–356°F (130–180°C) to create nutty pyrazine compounds.



**Use oil and alcohol** (e.g. rice wine, fermented soy sauce) to disperse the anethole.



**Cooking with alliums** creates meaty flavors when sulfur reacts with the anethole.



**Slow cook** with whole pods to allow time for the flavors to escape the woody husk.



# CHINESE STEAMED SALMON WITH CHILI AND STAR ANISE

Simple and easy to prepare, this delicately spiced Chinese supper is given a piquant twist with star anise and Scotch bonnet chili, adding depth to the dish without overpowering the mild flavor of the fish. It works especially well with lightly smoked salmon, but if you prefer you can use unsmoked fillets.

## SPICE IDEAS

Swap in **different colored peppers:** black pepper for a more aromatic, complex heat; green pepper for dominant herbaceous notes.

Be inspired by the fresh spices to **try alternatives to star anise:** allspice will pick out fruity esters in chili; citrus-floral coriander will enhance the citral in ginger.

Replace **fresh chilis with dried**—rehydrated and sliced—for smoky, toasted flavors.

*Serves 4*

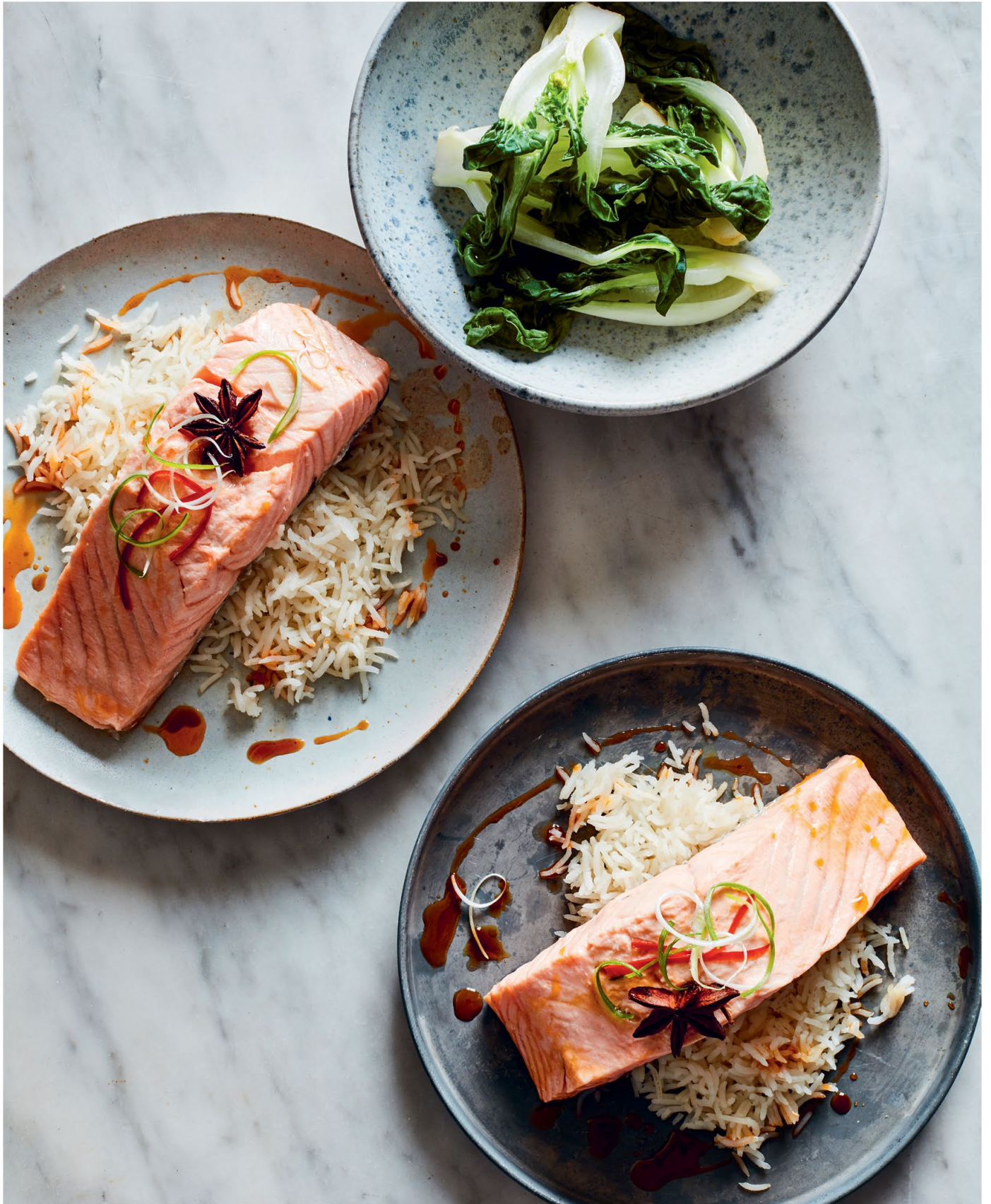
*Prep time 30 mins*

*Cooking time 10 mins*

4 lightly smoked salmon fillets, skinned  
 ½ tsp ground white pepper  
 handful of star anise, broken up  
 1 tbsp Shaoxing wine or dry sherry  
 1 tbsp finely chopped fresh root ginger  
 1 Scotch bonnet chili, seeded and cut into around 12 strips  
 2 tsp light soy sauce  
 2 tsp dark soy sauce  
 3 spring onions, finely chopped  
 1 tbsp vegetable oil  
 2 tsp sesame oil  
 1 tsp chili oil

- 1 Rub the salmon fillets with the white pepper. Arrange them in a single layer in a heatproof dish, placing one piece of star anise underneath and one piece on top of each fillet of fish.
- 2 Pour in the wine or sherry, sprinkle the ginger over the fish, and place a few strips of chili on top of each salmon fillet.
- 3 Pour water to a depth of ¾in (2cm) into a steamer or deep pan with a trivet in the bottom, and bring to a simmer. Place the fish dish in the pan, cover the pan tightly with foil, and steam over low-medium heat for 8–10 minutes, depending on the thickness of the fish. Add more hot water to the pan if necessary.
- 4 When the fish is cooked, take the dish from the pan and remove the star anise pieces. Pour the soy sauces over the fish and sprinkle with the spring onions.
- 5 Heat a wok or heavy pan over high heat. Add the three oils and swirl them around the pan. When the oil is very hot and slightly smoking, remove from the heat and pour over the fish. Serve with steamed rice and stir-fried greens, such as bok choy.







# FENNEL

*Aniseedy | Warming | Bittersweet*

## BOTANICAL NAME

*Foeniculum vulgare* (bitter fennel),  
*F. v. var. dulce* (sweet fennel)

## ALSO KNOWN AS

Sweet cumin

## MAJOR FLAVOUR COMPOUND

Anethole

## PARTS USED

Fruits (misnamed seeds), pollen

## METHOD OF CULTIVATION

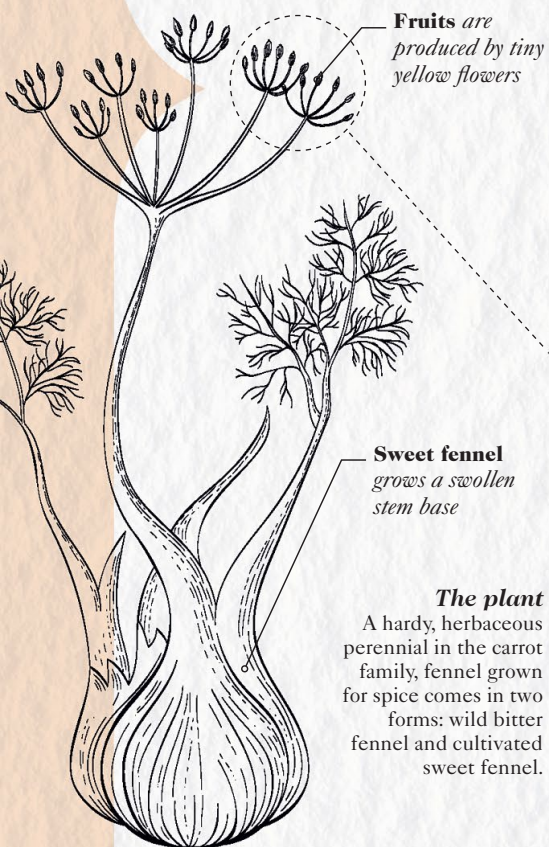
Plants are cut when the seeds have matured on the flowering umbels and taken on a sage green color.

## COMMERCIAL PREPARATION

Umbels bearing the fruits are dried, then threshed, cleaned, and graded.

## NON-CULINARY USES

Essential oil in cough medicines, soaps, and perfumes. In herbal medicine to improve vision and aid digestion.



### The plant

A hardy, herbaceous perennial in the carrot family, fennel grown for spice comes in two forms: wild bitter fennel and cultivated sweet fennel.



### Whole

Bitter fennel has a mild bitter taste a little like celery seed. Aniselike sweet fennel is more widely available.

## Spice story

Herbalists throughout the ages, from the Vedic tradition of India to the authors of Ancient Greek medical texts, have endorsed fennel for its sight-restoring powers and as an antidote to snake bites. The Greek for fennel is *maratho*, and the plains of Marathon, where the Greeks won a decisive battle against the Persians in 490 BCE, were named for their “fennel fields.” The Romans introduced the spice to all the lands they conquered, and by the early medieval period its popularity was widespread across Europe, thanks in part to the King of the Franks, Emperor Charlemagne (742–814 CE), who demanded that it be cultivated on his Imperial farms. European colonists used fennel as a preservative and to disguise the flavor of meat past its best. They spread the plant to the Americas and Australia, where wild escapees are now considered noxious weeds.



### Region of cultivation

Fennel is native to the Mediterranean and cultivated throughout Europe, but India is in fact the main producer. Other notable growers include Turkey, Japan, Argentina, North Africa, and the US (mostly California).

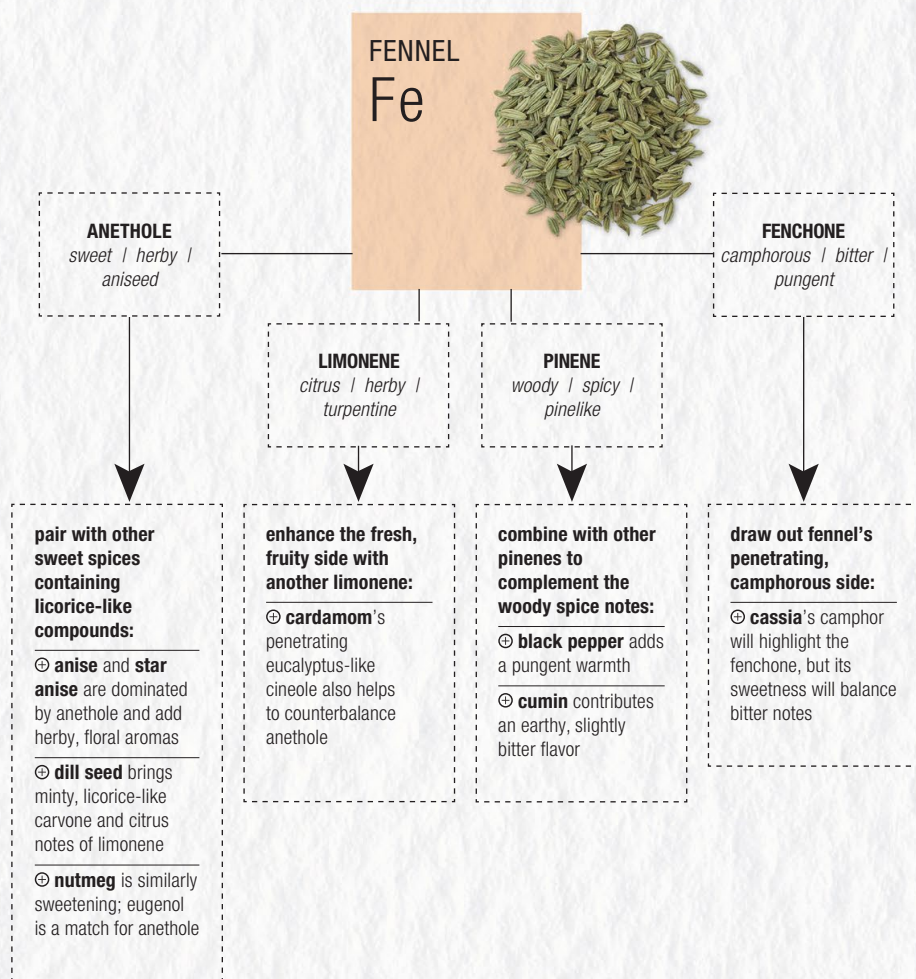


## Kitchen creativity

Fennel enhances both sweet and savory foods with its mild aniseed character. The spice is most notable as a flavoring for Italian salami, and for its use in masala blends throughout South Asia, from Kashmir to Sri Lanka.

### BLENDING SCIENCE

The main sweet aniseed flavor of fennel comes from powerful anethole, while penetrating fenchone contributes bitter pungency, and small amounts of citrusy limonene and pine-scented pinene are also present.



### FOOD PARTNERS

- ⊕ **Plums and figs** Add toasted seeds when poaching or making jams and chutneys.
- ⊕ **Fruiting vegetables** Stir ground fennel into an eggplant, zucchini, and tomato *caponata* stew.
- ⊕ **Pork and beef** Mix into meatballs or lightly crush with salt as a rub for roasting pork belly skin.
- ⊕ **Oily fish** Crush with a little pepper and salt and then sprinkle on top of fish fillets before frying.
- ⊕ **Almonds** Sprinkle sugar mixed with crushed fennel over warm almond cookies.

### RELEASE THE FLAVOR

Fennel's flavor-containing oils are housed within hollow tubes (canals) just beneath the outer ridges of the fruits.



**Grinding** the seeds will break the canals and help the oils to escape.



**Toasting** beforehand will create new roasted, nutty pyrazine flavors, which quickly combine with existing flavor compounds.

### BLEND S TO TRY

Try these recipes for classic blends featuring fennel, or why not adapt them with some blending science?

**Panch phoran** p.43

**Five-spice powder** p.60



# LICORICE

*Sweet | Aniseedy | Warm*

## BOTANICAL NAME

*Glycyrrhiza glabra*

## ALSO KNOWN AS

Sweetwood, Spanish  
juice plant, *jethimadh*

## MAJOR FLAVOR COMPOUND

Glycyrrhizin

## PARTS USED

Roots and rhizomes (underground stems)

## METHOD OF CULTIVATION

Roots and rhizomes are harvested by digging up the whole plant when it is 3–5 years old.

## COMMERCIAL PREPARATION

Roots and rhizomes are cut off, cleaned and trimmed, and then dried for several months.

## NON-CULINARY USES

Tobacco flavoring; ingredient in cough medicines and lozenges; in traditional medicine to treat inflammation, peptic ulcers, and chest complaints.

### The plant

Licorice is a herbaceous perennial in the pea and bean family, with rhizomes that form a branched, spreading network.

**Bluish-purple flowers produce reddish-brown, bristly seed pods**

**Rhizomes are bright yellow and pencil thick**

### Powder

The ground dried root is available in various shades and in “fine” or “raw” varieties, depending on the plant variety and how it was processed.

### Whole

Dried licorice root can be bought in slices or in pieces of up to 8in (20cm) long, and will store almost indefinitely in a sealed container in a cool, dry place.

## Spice story

Ancient Assyrians, Babylonians, Egyptians, Greeks, and Romans all chewed licorice to allay thirst, freshen breath, and increase stamina. The spice reached China, where it was used as a stimulant and antidote to poison, via the Silk Road over 2,000 years ago. By the 12th century, licorice extract was being widely used in northern Europe, often cultivated by monks and prescribed for coughs, gastric ulcers, and chest complaints. The first licorice candy was made in 1760, and by the late 19th century candies and liqueurs were being manufactured across Europe, particularly in Nordic countries. The spice was also being used to flavor tobacco, and today the majority of the world’s crop is grown for this purpose. Its use as a spice remains localized to China, India, and Scandinavia.



### Region of cultivation

Licorice is native to the Mediterranean region and West Asia. It is cultivated mainly in Russia, Spain, and the Middle East, but also in North Africa, France, Italy, Turkey, North America, India, and China.

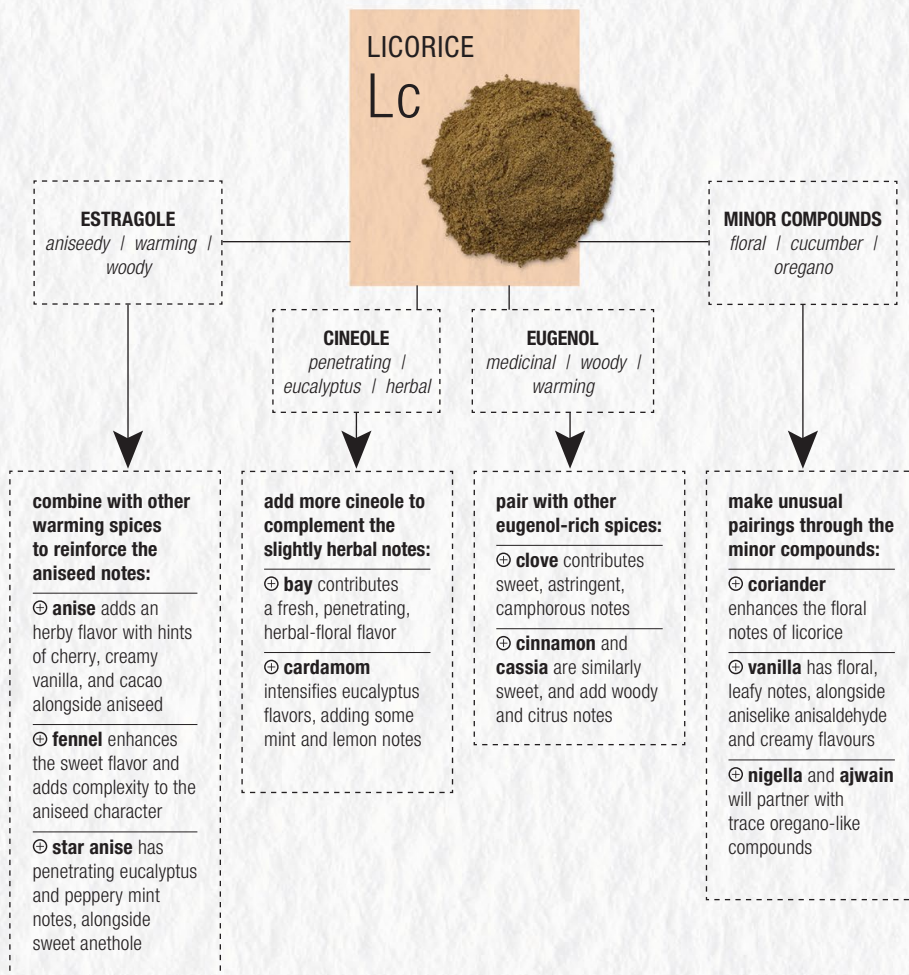


## Kitchen creativity

The dried root or rhizome has an intense aniseed flavor and warm, lingering sweetness. It can be used to infuse sweet dishes, stocks, sauces, and stews, and it is added to spice blends such as Chinese five-spice. Use sparingly to avoid overwhelming the dish.

### BLENDING SCIENCE

The powerful sweetening effect of licorice root is produced by glycyrrhizin, a compound that is around 50 times sweeter than sugar. The warming, medicinal flavors of this spice are produced by three compounds— aniseed-like estragole, eucalyptus-like cineole, and clovelike eugenol. Small amounts of floral linalool, cucumber-like aldehydes, and oregano-tasting phenols give licorice its rounded, complex taste.

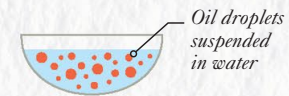


### FOOD PARTNERS

- ⊕ **Citrus** Sprinkle a little ground licorice over a grapefruit and orange salad.
- ⊕ **Asparagus, fennel** Add to a butter dressing for grilled asparagus, or sprinkle over roasted fennel with lemon.
- ⊕ **Oily fish** Add ground licorice to a cure for salmon or trout.
- ⊕ **Ham, beef** Infuse a braising liquid for a ham or beef brisket with licorice root.
- ⊕ **Baking** Use ground in gingerbread dough, or steep licorice root in the syrup for a steamed sponge pudding.
- ⊕ **Preserves** Use to flavor apple jelly and cherry jam, or with cardamom and coriander in a Scandinavian plum chutney.

### RELEASE THE FLAVOR

The glycyrrhizin in licorice helps to disperse the flavors of both licorice and any other spices in a dish by enabling oil and water to mix.



**Added to water**, glycyrrhizin can thicken to form a gel that allows oil and water to form a smooth mixture.



**Add licorice** near the start of cooking to maximize the taste.



**Steep** the root in hot water first for dishes with a short cooking time or little liquid.

### BLEND TO TRY

Use and adapt these classic blends featuring licorice:

*Nanjing spice bag* p.59

*Five-spice powder* p.60



# MAHLEB

*Bittersweet | Fruity | Woody*

## BOTANICAL NAME

*Prunus mahaleb*

## ALSO KNOWN AS

Mahlab, *mehlepi*, rock cherry, St. Lucie cherry

## MAJOR FLAVOR COMPOUND

Coumarin

## PARTS USED

The kernel (seed) within the stone of the fruit

## METHOD OF CULTIVATION

The ripe cherries are harvested in the autumn, when they have turned dark purplish-black.

## COMMERCIAL PREPARATION

The small, soft kernel is extracted by cracking open the stone inside the thin-fleshed cherry fruit. The seed is then blanched, dried, and ground or sold whole.

## NON-CULINARY USES

Essential oil is used in perfumery.

### The plant

Mahleb cherry is a deciduous tree or large shrub that belongs to the rose family.



**Ground mahleb** should be pale cream in color

### Powder

Less bitter and flavorful than whole kernels, the powder turns rancid fairly quickly due to its high oil content.

### Oval kernels

are soft and about the size of peppercorns

### Whole

Whole kernels retain their flavorful oils better than ground spice, but should be frozen for prolonged storage.



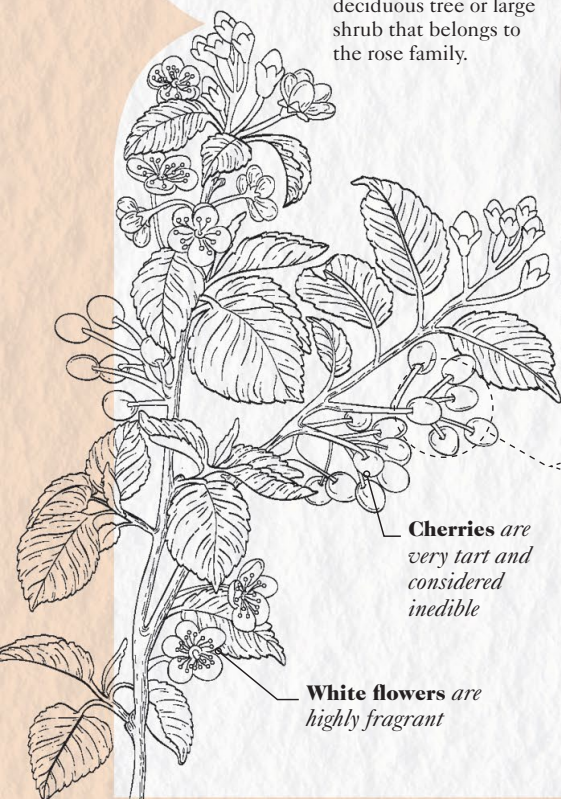
## Spice story

Mahleb cherry stones have been found at Mediterranean and Middle Eastern prehistoric sites, but written evidence of their use in ancient times is scarce. The earliest perfume recipes listing kernels for their aromatic qualities date back only to the 12th century CE. There is some evidence, though, that mahleb may have been cultivated as early as the Sumerian era (4500–1900 BCE) in ancient Mesopotamia, around modern-day Iraq and Syria. In the native regions of the mahleb cherry tree, use of the dried, ground kernels as a culinary spice dates back centuries, popular in rich breads and cakes enjoyed at religious holidays. Mahleb is not commonly used outside Greece, Turkey, North Africa, and the Middle East, although Greek Americans often add it to their European-style yeast cakes and pastries.



### Region of cultivation

Mahleb is native to the Mediterranean region, parts of Central Asia, and Iran. It is mainly cultivated in the Anatolia region of Turkey, and in Syria and Iran.



**Cherries** are very tart and considered inedible

**White flowers** are highly fragrant



## Kitchen creativity

Mahleb is luxuriously sweet and fruity, with an almond aroma and a woody cherry taste; whole kernels also release a bitterness when chewed. Mainly known as a baking spice, it can add fruit-and-nut notes to savory dishes.

### BLENDING SCIENCE

A lactone called coumarin produces mahleb's creamy taste, like sweet clover and apricot. Almond notes come from methoxyethyl cinnamate, and the spice also contains woody, peppery azulene and balsamic, fruity pentanol, as well as green apple-like dioxolane. Bitterness in the fresh spice comes from phenols.

MAHLEB  
Mb



**COUMARIN**  
*sweet | floral | grassy*

**METHOXYETHYL CINNAMATE**  
*warming | balsamic | fruity*

**AZULENE**  
*woody | peppery | herbal*

**PENTANOL**  
*balsamic | fruity | floral*

#### pair with sweet spices or those with creamy nuances:

- ⊕ **clove** contributes sweet, astringent, camphorous notes
- ⊕ **nutmeg** adds warm spiciness
- ⊕ **licorice** brings sweetness and eucalyptus-like notes, and sometimes contains coumarin-like substances
- ⊕ **vanilla** lends rich, mellow creaminess

#### combine with other warming spices:

- ⊕ **cinnamon** and **cassia** contribute sweet, spicy, woody qualities
- ⊕ **galangal** contains a similar cinnamate compound and hints of cherry, adding a penetrating pungency
- ⊕ **ginger** adds hotness and sweet, citrusy notes

#### complement the sweet woodiness of mahleb:

- ⊕ **sesame** brings harmonizing nutty and bready flavors; pale, unroasted seeds also have a creamy taste
- ⊕ **cacao** adds bitter chocolate notes, pairing well with the sweet coumarin

#### pair with spices that either contain pentanol or enhance its flavor:

- ⊕ **poppy** seeds contain pentanol and add earthiness
- ⊕ **lemon myrtle** has distinctive green odors from the fruity tasting heptanone, and adds a powerful lemon-lime flavor

### FOOD PARTNERS

- ⊕ **Stone fruit** Use ground mahleb to thicken a sweet cherry sauce, add it to a plum crumble topping, or sprinkle it over roasted apricots or peaches.
- ⊕ **Meat** Add to a Turkish dry spice rub for roast duck legs, pork, or lamb.
- ⊕ **Baking** Include mahleb with other warm spices in festive pastries, or add it to the sweet dough for an apricot tart.
- ⊕ **Ice cream** Sprinkle into cherry ice cream and top with candied pistachios.
- ⊕ **Tonka beans** Partner with vanilla-like tonka beans, which are similarly high in coumarin, in sweet recipes.

### RELEASE THE FLAVOR

Of mahleb's flavor compounds, only dioxolane and some bitter phenols are soluble in water to any great extent. Cooking in a water-based liquid will therefore result in a "green" and bitter taste and should be avoided.



**Grind kernels** to release short-lived oils. Leave for a few minutes before use to let bitter phenols evaporate.



**Add to fats** before mixing into a recipe to allow sweet and woody flavors to come to the fore.



**Application of heat** will decrease the bitter flavors and allow hints of cherry fruitiness to emerge.



# VANILLA

*Sweet | Musky | Woody*

## BOTANICAL NAME

*Vanilla planifolia*

## MAJOR FLAVOR COMPOUND

Vanillin

## PARTS USED

“Pods” (which are really fruits)

## METHOD OF CULTIVATION

Plants are trained up posts or trees and the flowers pollinated by hand. Pods are picked before fully ripe.

## COMMERCIAL PREPARATION

Pods are scalded or steamed, then sweated in sealed containers to make them release defensive phenol molecules. These react with the air and destructive plant enzymes to disintegrate into dark, flavorful compounds. Pods are then dried until black and shriveled to one-fifth their original weight.

## NON-CULINARY USES

In perfumes and cosmetics.

### The plant

Vanilla is the fruit of a perennial, vine-like tropical orchid that bears bunches of green-yellow flowers.

**Flowers**  
must be  
pollinated  
by hand

**Fresh pods**  
are 6–10 in  
(15–25 cm)  
long and look  
like green beans



### Extract

This is made by macerating pods in alcohol. Find labels saying “natural extract” and stating around 35 percent alcohol.

**Dark, plump**  
appearance is  
a sign of good  
sweating and  
maturing

### Whole pods

Brittleness is a sign of age, but pods can keep their flavor for up to 4 years. Frosting is caused by exposure to air.



## Spice story

Vanilla was first cultivated for its scent 1,000 years ago on the eastern coast of Mexico by the Totonac people. The first recorded use as a flavoring dates to the 15th century CE, when the Aztecs conquered the Totonacs, discovered the beanlike fruit, and used it to flavor cacao drinks. The Spanish conquistador Cortés was served just such a drink by the Aztec king in 1519 and took vanilla pods and cacao beans back to Spain. But Mexico retained a monopoly because the pods would only form when pollinated by native orchid bees. That is, until the 1830s, when a Belgian botanist unraveled the mystery and devised a technique of hand pollination. In 1874, German chemists created a synthetic alternative to the natural flavor, and now 97 percent of vanilla-flavored foods are made with synthetic vanillin.



### Region of cultivation

Vanilla is native to Mexico and Central America, where it is still cultivated. It is also grown in Madagascar, Réunion, India, Sri Lanka, Indonesia, and Tahiti.



## Kitchen creativity

Rich, mellow vanilla has historically been used in sweet cooking, but is an increasingly popular addition to savory dishes, particularly fish and seafood. Tread carefully, though, as it can easily overwhelm a dish.

### BLENDING SCIENCE

Vanillin is a phenol that makes up 85 percent of vanilla's flavor and has a natural affinity with other sweetly fragrant spices. But more than 250 flavor compounds can be present, which encompass woody, spicy, floral, and fruity aromas. These lesser compounds distinguish vanilla pods from synthetic vanillin flavoring.



### FOOD PARTNERS

- ⊕ **Vegetables** Add seeds to carrots, cauliflower, root vegetables, or potatoes. Put a split pod in a tomato chutney.
- ⊕ **Strawberries** Combine vanilla and black pepper in a caramelized sugar syrup for macerating strawberries.
- ⊕ **Fish, seafood** Stir into melted butter and brush over grilled lobster, scallops, or fish; put a sliver of pod in a pan of mussels before steaming.
- ⊕ **Desserts** Add to chocolate and cream desserts. Use vanilla-flavored sugar in cake and pancake batters.

### RELEASE THE FLAVOR

Many trace compounds in vanilla are quick to evaporate: use seeds immediately and cook on low heat to avoid losing subtle nuances.



**Lightly pound** pods to release flavor from the inner fibers.



**Add whole pods** early in cooking to allow flavors to diffuse out of the tough tissue.

### Vanilla chooser

Depending on where they were grown and how they were dried and cured, vanilla pods will derive from one of three orchid species and have varying levels of vanillin and different flavor profiles.

Country	Plant	Flavor content	Description
Madagascar, Réunion	<i>Vanilla planifolia</i>	2% vanillin	Bourbon vanilla is esteemed as rich and balanced.
Mexico	<i>Vanilla pompona</i>	1.75% vanillin	Mexican vanilla carries winelike and fruity flavor compounds.
Tahiti	<i>Vanilla tahitensis</i>	1.70% vanillin	The most expensive vanilla, with a deep flavor that includes cherry-chocolate, licorice, and caramel.
India, Sri Lanka	<i>Vanilla planifolia</i>	1.50% vanillin	Vanilla grown in South Asia has lower levels of vanillin, resulting in a gentler flavor and a smokiness.



# NUTMEG

*Bittersweet | Woody | Warm*

**BOTANICAL NAME**

*Myristica fragrans*

**ALSO KNOWN AS**

True nutmeg, fragrant nutmeg

**MAJOR FLAVOR COMPOUND**

Myristicin

**PARTS USED**

Seed kernels

**METHOD OF CULTIVATION**

Fruit is harvested several times a year; one tree yields 10,000 or more nutmegs a year.

**COMMERCIAL PREPARATION**

Fruit is split open, dried, and the lacy aril removed to make mace. Seeds shells are cracked open to remove nutmegs.

**NON-CULINARY USES**

In pharmaceuticals, including toothpaste and cough syrups. Mild pain-killing power is used to treat toothache and joint pain.

**The plant**

Nutmeg comes from a tropical evergreen tree that produces two distinct spices: the seed (nutmeg) and its lacy covering (mace).

**Fleshy fruit casing** encloses the woody seed

**Bell-shaped flowers** have a lily-of-the-valley scent

**Grows to at least 40 ft (16 m) high**


**Powder**

Nutmeg is available ground, but its flavor oils are among the quickest of all spices to evaporate: far preferable to buy whole and grate fresh.

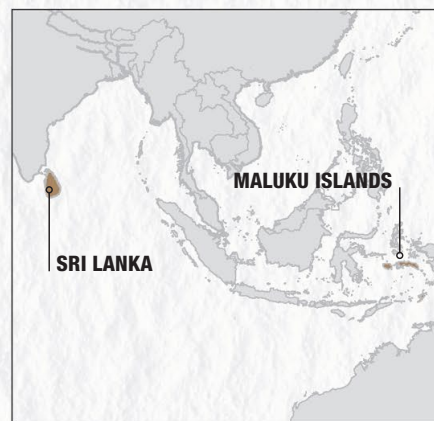
**Kernels are revealed after cracking open the seed casing**


**Whole**

Kernels keep for at least a year in a sealed container in a cool, dark place. Discard if black spots develop.

## Spice story

Native to the Banda Islands in the Moluccas (Maluku) archipelago of Indonesia, nutmeg has a complex, violent history. Its source was initially kept secret by traders who wanted to protect their valuable commodity, treasured for its rarity, flavor, and apparent aphrodisiac and healing properties. By the 16th century there was such huge demand for nutmeg in Europe that it was said to be more precious than gold, triggering a race to find and take control of its source. Portugal conquered the Moluccas in 1511, then the Dutch wrested control in 1599, and England seized two of the Banda Islands in 1603. The spice was so valued by the Dutch that they struck a deal with England to take back one of the islands in return for one of their settlements in the New World. The land they gave to England was known then as New Amsterdam—and today as New York City.


**Region of cultivation**

Nutmeg trees are grown throughout the Maluku (Moluccas) islands of Indonesia, and also in Sri Lanka, the Caribbean (notably Grenada), and South Africa.

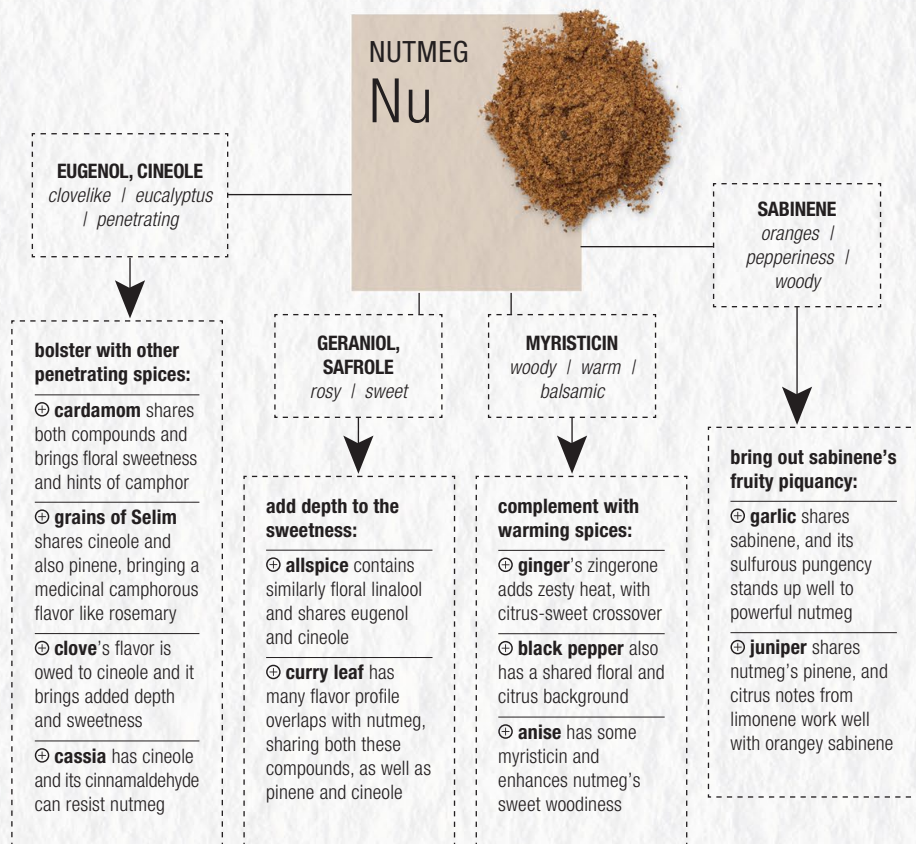


## Kitchen creativity

Nutmeg's deep, sweet, woody flavor works in both sweet and savory dishes. Somewhat penetrating and astringent with tannins, it can easily overpower a dish but blends happily with other strong spices.

### BLENDING SCIENCE

Nutmeg's woody aroma comes from myristicin, which is integral to its flavor profile, though it makes up only a small proportion of the oil. Nutmeg also contains peppery, fruity sabinene, floral geraniol and safrole, clovelike eugenol, eucalyptus-scented cineole, and conifer-like pinene.

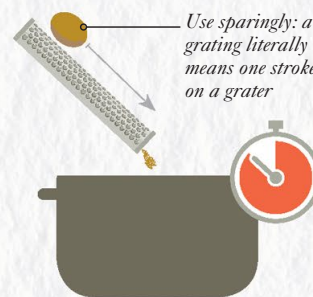


### FOOD PARTNERS

- ⊕ **Spinach** Grate over buttered or creamed spinach or add to the filling for spinach and ricotta ravioli.
- ⊕ **Lamb** Add a generous grating to meatball mixture or use in moussaka.
- ⊕ **Sauces and drinks** Include nutmeg in béchamel, cheese fondue, soufflés, Indian golden latte (*haldi doodh*), eggnog, and Caribbean nutmeg ice cream.
- ⊕ **Sweet pastries** Use in a Sienese *panforte* or sprinkle over custard tarts.

### RELEASE THE FLAVOR

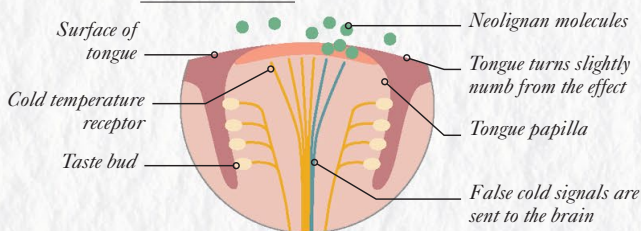
Nutmeg's flavor oils are so powerful they can easily overpower a dish, yet they are also short-lived.



Add toward the end of the cooking time for a stronger, more complex flavor, because the oils are very quick to evaporate.

### Neolignans' cooling effect

A group of chemicals called neolignans were recently discovered in nutmeg oil. These act on the temperature-sensing nerves on the tongue and in the mouth to give a numbing sense of lingering coolness.



### BLENDS TO TRY

Use and adapt these classic blends featuring nutmeg:

**Turkish baharat** p.23

**Bumbu** p.52

**Jamaican jerk rub** p.64

**Mulling spice** p.73

**Quatre épices** p.74



# CHICKEN AND EGGPLANT BIRYANI WITH SEVEN-SPICE

The biryani is a true melting pot of a dish. Conceived in Persia, it was introduced to India by Arab merchants, and became popular in almost every region. Seven-spice, Lebanon's answer to garam masala, gives this version a rich, smoky, Middle Eastern flavor. For a milder chili kick, simply halve the amount of chili flakes.

## SPICE IDEAS

Experiment with **your own seven-spice** mix: replace sweet spices with cumin and/or nigella for earthiness, or fenugreek for musty, bittersweet notes.

Highlight eucalyptus-like cineole found in several of the dry spices by **swapping fresh ginger** for cineole-rich galangal.

Preserve more of the pungent gingerols and zingiberene by **adding fresh ginger later**—at the same time as the peas—for a zestier hit of flavor.

*Serves 4–6*

*Prep time 30 mins*

*Cooking time 1 hour  
40–50 mins*

### For the seven-spice

1 tbsp black peppercorns  
1 tbsp allspice berries  
1 tsp cloves  
1 tsp coriander seeds  
1 tbsp ground cinnamon  
1 tsp ground ginger  
1 tsp grated nutmeg

### For the biryani

5 tbsp (75 g) butter  
4 skinless, boneless chicken thighs  
4 cloves  
1 star anise  
8 black peppercorns  
1 cup (250 g) basmati rice  
4–5 tbsp vegetable oil  
6–8 garlic cloves, thinly sliced  
3 in (7 cm) piece fresh root ginger, finely grated  
1 tsp chili flakes  
1 tbsp seven-spice (see above)  
2 eggplants, cut into ½ in (1 cm) cubes  
sea salt flakes and freshly ground black pepper  
1 cup (100 g) frozen peas

- 1 Make the seven-spice by grinding the whole spices and mixing with the remaining spices. Reserve 1 tablespoon and store the rest.
- 2 Preheat the oven to 325°F (160°C). In a large, ovenproof pan, melt about 2 tablespoons (25 g) of the butter and gently sauté the chicken thighs with the cloves, star anise, and peppercorns. When the chicken starts to turn opaque, cover with boiling water and bring to a simmer. Cook in the oven with the pan lid on for about an hour, until the meat is tender. Take out the chicken and set aside.
- 3 Remove the spices from the liquid, then add boiling water to fill the pan. Add the rice and a good pinch of salt. Boil for 7–8 minutes, until the rice starts to soften. While the rice is cooking, shred the chicken, then line a large, heavy-based saucepan with baking paper. Drain the rice and rinse under the cold tap.
- 4 Heat 2 tablespoons of the oil in a frying pan and fry the garlic for less than a minute over a medium heat. Then add the ginger, chili flakes, seven-spice, and a good pinch of sea salt. Add the chicken, followed by a little more oil and the diced eggplant. Stir fry for about 5 minutes, until the chicken and eggplant are coated in oil and spices. Season with salt and pepper.
- 5 Melt the remaining butter with a little oil, then pour into the paper-lined saucepan. Sprinkle with sea salt and add a thin layer of rice, then a layer of chicken and eggplant mix. Repeat, alternating the layers and finishing with rice. Poke a few holes in the mixture with a wooden-spoon handle, to allow steam to rise through the dish.
- 6 Wrap the pan lid in a tea towel and put it on the pan. Cook over the lowest heat possible for 35–45 minutes. With 15 minutes to go, add the peas to the pan. At the end of cooking, use a fork to check that the bottom layer of rice has formed a crust. If it has not, raise the heat and cook for up to 5 more minutes.
- 7 To serve, flip the biryani onto a dish, so that the golden, crispy rice base—known in Persian as the *tahdig*—is on top. For a crispier crust, omit the paper, but ensure that the rice does not burn while cooking.







# MACE

*Sweet | Warm | Aromatic*

**BOTANICAL NAME**

*Myristica fragrans*

**PARTS USED**

Aril (seed covering) of the nutmeg seed

**MAJOR FLAVOR COMPOUND**

Sabinene

**METHOD OF CULTIVATION**

Ripe fruits are often harvested from trees using a long pole with a basket attached, called a *gai-gai*.

**COMMERCIAL PREPARATION**

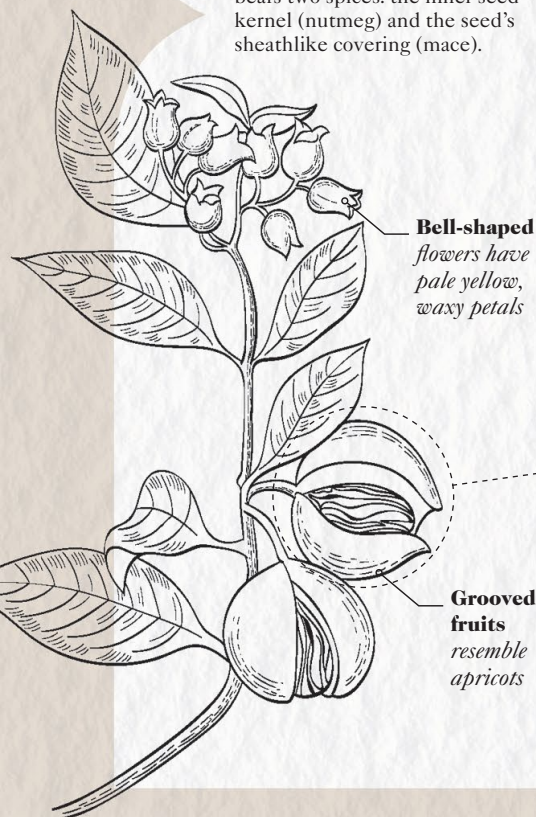
The split fruit reveals a nutmeg seed with a plasticky, scarlet-red covering called an aril. The leathery aril is peeled off, pressed and dried. Grenadian mace is traditionally “cured” in the dark for several months. Mace is then either ground or sold whole as “blades” after drying.

**NON-CULINARY USES**

In perfumes, soaps, and shampoos; in traditional medicine to relieve bronchial disorders and rheumatism, aid digestion, and improve circulation.

**The plant**

Mace is from a tropical tree that bears two spices: the inner seed kernel (nutmeg) and the seed’s sheathlike covering (mace).



**Bell-shaped flowers** have pale yellow, waxy petals

**Grooved fruits** resemble apricots


**Powder**

Ground mace keeps reasonably well, although subtler flavors are lacking.

**Blades exude oil** when pressed with a fingernail


**Whole**

Dried arils, or pieces thereof, are known as blades. Orange-red blades tend to be from Indonesia, while Grenadian blades are dried to a paler orange-yellow.

## Spice story

Native only to the tiny Banda Islands in the Moluccas (Maluku) archipelago of Indonesia, mace was being traded with the Byzantine empire by the 6th century CE, where it was widely valued as a cure-all, food preservative, fumigant, and aphrodisiac. By the Middle Ages, mace had become one of the most sought-after and expensive spices of European cuisine. The appetite for these spices prompted a centuries-long, bloody power struggle between the Portuguese, Dutch, and English to gain control of the growing regions. Eventually, the English managed to establish their own supply by successfully transplanting nutmeg trees, along with their soil, to several of their colonies, including Grenada and Sri Lanka. With greater availability, nutmeg and mace overtook saffron and mustard as the spices of choice in Western cuisine, with mace more common (and cheaper) than nutmeg.


**Region of cultivation**

Mace is cultivated across the Maluku (Moluccas) archipelago of Indonesia, and also in Sri Lanka, South Africa, and the Caribbean—notably Grenada, which features an image of nutmeg and mace on its national flag.

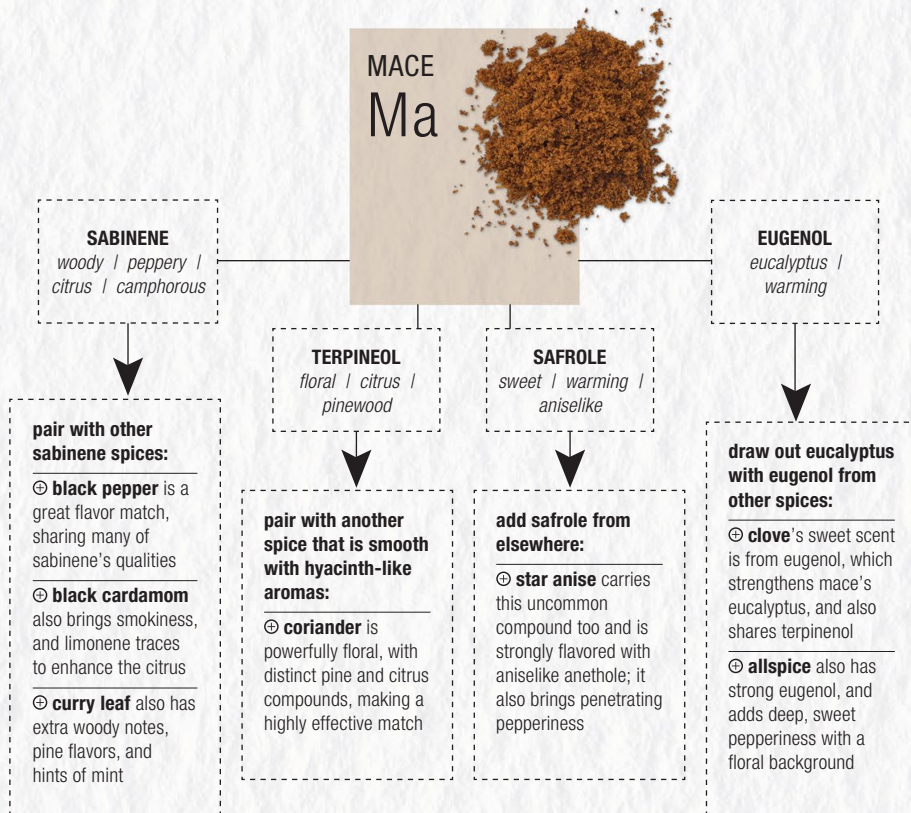


## Kitchen creativity

Mace will substitute for nutmeg in most sweet dishes, but it is mostly used to flavor savory sauces, meat, pickles, and chutneys. Use whole blades to infuse pale creams and clear broths where flecks of grated nutmeg are unwanted.

### BLENDING SCIENCE

Peppery sabinene is less dominating in mace than in nutmeg and mace has more fragrant oils, with a wider diversity of perfumed compounds, including floral elemicin, which works in partnership with terpineol, and small amounts of eugenol and safrole. Mace lacks the mouth-puckering tannins of nutmeg, giving it a smoother mouthfeel.



### FOOD PARTNERS

- ⊕ **Vegetables** Sprinkle ground mace over a creamy potato bake, spinach or carrot soup, or try it in a vegetable pilau.
- ⊕ **Shellfish** Add a blade of mace to a shellfish broth, or sprinkle ground mace over potted shrimp or crab before stirring it through warm pasta or serving it on toasted rye bread.
- ⊕ **Pork, chicken** Sprinkle a little ground mace into the mixture for pork, ricotta, and lemon-zest meatballs. Add a blade to a béchamel sauce for a creamy chicken pie.
- ⊕ **Cheese sauce** Infuse milk with a blade of mace, then make into a cheese sauce for lasagne or macaroni and cheese.
- ⊕ **Desserts** Infuse into custard for a trifle or whisk into sweetened whipped cream to serve with fruit.
- ⊕ **Baking** Add ground mace to spiced cake batters, or sprinkle sparingly over pumpkin pie or milk puddings.

### BLEND TO TRY

Use and adapt this spice blend recipe featuring mace:

**Garam masala** p.40

### RELEASE THE FLAVOR

The oil-based compounds in mace dissolve poorly in water and its flavor can change with prolonged heating: some compounds evaporate and degrade while new terpenelike compounds are formed, producing tastes many people dislike.



**Mace's** more subtle terpene flavors can be lost through evaporation, so grind as needed and use immediately.



**Include oil** in the cooking liquid or gently fry, for example with an onion base, near the beginning of a dish.



**Add whole mace** early to give maximum time for oils to diffuse out of the blades, but be wary of lengthy cooking.



**Add powder** later as it diffuses and spreads more quickly, and this reduces evaporation of terpenes.



# CARAWAY

*Menthol | Warming | Earthy*

## BOTANICAL NAME

*Carum carvi*

## ALSO KNOWN AS

Carvies, and (incorrectly) wild cumin, Persian cumin, meridian fennel.

## MAJOR FLAVOR COMPOUND

S-carvone

## PARTS USED

Seedlike fruits

## METHOD OF CULTIVATION

Plants are grown for two years and harvested in the second summer, when the seedlike fruits darken.

## COMMERCIAL PREPARATION

The cut flower heads are left for up to 10 days to dry and finish ripening, before being cleaned and threshed.

## NON-CULINARY USES

The essential oil flavors commercial mouthwash and children's medicines; as a traditional remedy to aid digestion.

### The plant

Caraway is a frost-hardy biennial in the carrot family. It thrives in rich clay soil and can grow up to 2 ft (60 cm) tall.

Fruits develop from umbels of creamy white flowers

Feathery leaves are edible and taste quite similar to dill

The "seeds" are actually a dry fruit



### Whole

Store the brown, crescent-shaped "seeds" in a sealed container in a cool, dark place for up to six months. They benefit from gentle toasting.

### Powder

Caraway can be bought in powder form, but the flavor quickly diminishes, and it is better to buy whole and grind as needed.



## Spice story

Archaeologists have discovered caraway seeds in Stone Age refuse pits and 5,000-year-old dwellings in Switzerland, but the first written reference dates to around 1500 BCE, in an Egyptian herbal encyclopedia. The spice also held symbolic significance for the Egyptians, who placed the seeds in tombs to ward off evil spirits. The Romans knew it as *karo* or *careum*, and introduced the spice to northern Europe. By the Middle Ages, caraway had become a common ingredient in game and meat cookery and bean and cabbage dishes, as well as sweeter confections and as a flavoring for alcohol; *Kümmel*, the German for caraway, is also the name of a still-popular liqueur. Folklore abounds that placing caraway seeds in your lover's pocket will keep them faithful.



### Region of cultivation

Caraway is native to central Europe and Asia, and its major producers are Finland, Poland, the Netherlands, Germany, Ukraine, Hungary, and Romania. Cultivation has also spread to North Africa, Egypt, and North America.

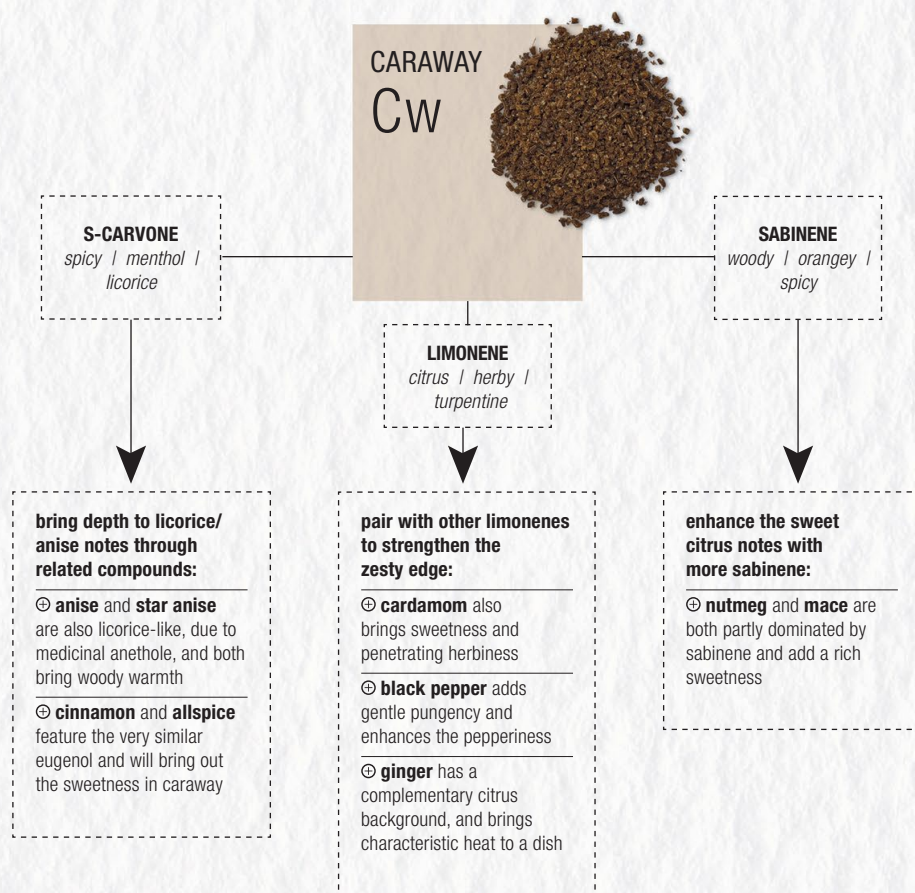


## Kitchen inspiration

Caraway has a complex, warming taste, and its flavor can be found in many central European dishes. It is a key component of the Algerian and Tunisian blend *tabil*, and may be used in harissa, the chili-based paste from North Africa.

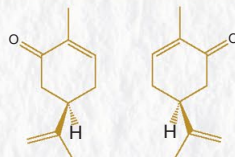
### BLENDING SCIENCE

The most abundant flavor compound is the oil-loving terpene S-carvone, which, unlike most terpenes, confers a powerfully spicy flavor, with hints of menthol and rye, reminiscent of anise. The other major flavor compounds are citrusy limonene, with lesser amounts of woody sabinene.



#### Mirror-image compounds

S-carvone, the main flavor compound in caraway, has exactly the same molecular structure as D-carvone, the cooling, minty flavor compound found in spearmint. However, they are mirror images, which means these twin chemicals produce completely different aromas, and caraway's flavor is spearmint turned inside out!



D-carvone (spearmint)

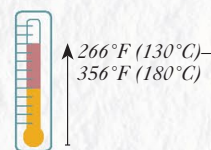
S-carvone (caraway)

### FOOD PARTNERS

- ⊕ **Cabbage, beets** Add ground to buttered cabbage, and whole to beet slaw or soup.
- ⊕ **Red meats** Stir into sausage, beef, or lamb stews, or use to flavor dumplings and serve on the side.
- ⊕ **Duck, goose** Massage a mix of ground caraway, salt, and garlic over duck and goose before roasting.
- ⊕ **Oily fish** Combine with pepper, fennel, and coriander in a cure.
- ⊕ **Swiss cheese** Drop a pinch of ground caraway into silky fondue.
- ⊕ **Cookies** Sprinkle the seeds over just-baked shortbread.

### RELEASE THE FLAVOR

Cook with oil to allow flavor compounds to dissolve and add late in cooking if using ground caraway.



**Toasting** caraway increases the flavor intensity, but take care not to over-toast, which makes them bitter.

### BLEND TO TRY

Try this recipe for a classic blend featuring caraway, and why not adapt it with some blending science?

**Harissa** p.33



# DILL

*Bitter | Citrus | Woody*

**BOTANICAL NAME**

*Anethum graveolens*

**ALSO KNOWN AS**

False aniseed

**MAJOR FLAVOR COMPOUND**

D-carvone

**PARTS USED**

“Seeds” (technically fruits)

**METHOD OF CULTIVATION**

Fruits are harvested after flowering. Seeds are left to ripen and dry on the stalk.

**COMMERCIAL PREPARATION**

Cut stalks are stacked and left for a week or so to dry. The fruits are then threshed from the flower heads by machine.

**NON-CULINARY USES**

In traditional medicine to treat stomach complaints—it’s a common ingredient of gripe water—and as a gentle sedative.

**The plant**

Dill is a hardy annual plant in the parsley family.

“Seeds” are the ripe fruits of the plant that have been allowed to dry on the stalk

Fernlike leaves are used as a herb


**Powder**

Dill seed is available ground, but don’t get it confused with “dill weed,” a name the dried herb is sometimes sold under.

**Whole**

The oval, brown-beige seeds look very similar to fennel seeds. They have little aroma until crushed and ground.



## Spice story

Evidence suggests that the seeds and fronds of the dill plant were used for medicinal purposes in Egypt as early as 3000 BCE, and the ancient Greeks appreciated dill’s digestive and sedative properties. The seeds were first used as a seasoning and flavoring for vinegars and pickles in Scandinavia and in central and eastern Europe. By the Middle Ages, dill was a common culinary herb, and was also used in witchcraft, love potions, and as an aphrodisiac. Kosher dill pickles later became a dietary staple for Jews living in eastern Europe and in Russia, and were introduced to the US by eastern European Jewish immigrants in the late 1800s and early 1900s. Dill rapidly became an important commercial crop for the pickling industry in the US, although today most of that industry’s seed supply comes from India.


**Region of cultivation**

Dill is native to southern Europe, the Middle East, and the Caucasus. It is now mainly grown in India, Pakistan, the US, and countries around the southeast corner of the Mediterranean.

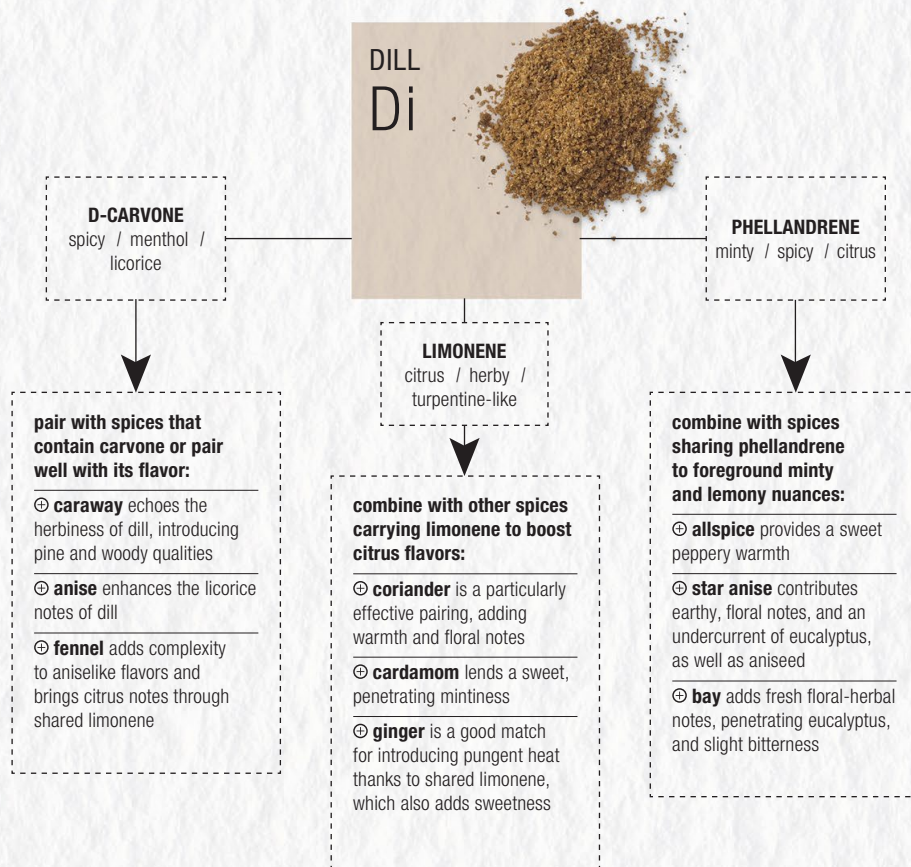


## Kitchen creativity

The flavor of dill seeds resembles a cross between anise and a milder version of caraway, having the latter's herby flavor with lemony overtones and a gentle woodiness. There is also a hint of bitterness.

### BLENDING SCIENCE

The flavor profile of dill seeds is dominated by D-carvone, a terpene flavor compound, which is spicy with hints of menthol, rye, and aniselike licorice. The other significant flavor compound is citrus-scented limonene. There are also small amounts of bitter fenchone, and phellandrene, which has minty aromas.



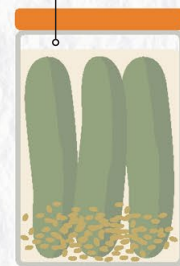
### FOOD PARTNERS

- ⊕ **Apples** Caramelize apples in butter and sugar with dill seeds; good on its own or with roasted pork.
- ⊕ **Carrots, onions** Sprinkle over baked onions or honey-roasted carrots.
- ⊕ **Fish** Lightly toast seeds with cumin and coriander, coarsely grind, and rub over fish skin before grilling or roasting.
- ⊕ **Goulash** Swap caraway seeds for dill seeds in a paprika-spiced beef or pork goulash, served with sour cream.
- ⊕ **Flatbreads** Heat the seeds in melted butter or ghee and brush over flatbread before serving.

#### Dill pickles

Although dill's flavor compounds do not dissolve well in water, the ample pickling time and fermentation process help the compounds to escape.

*Compounds such as carvone and limonene dissolve in alcohol*



**Fermentation** in low-temperature pickling produces alcohol to help disperse flavors.

### RELEASE THE FLAVOR

Dill benefits from toasting to create new flavor compounds from the interaction of sugars and amino acids. Both new and existing compounds dissolve poorly in water, however.



**Toast seeds** to create nutty and roasted flavor compounds, particularly pyrazines.



**Cook in** oil or fats to allow flavor compounds to escape.



# EJJEH WITH ZUCCHINI, FETA, AND DILL AND BLACK LIME HARISSA

Ejjeh is a Lebanese omelette of fresh herbs and zucchini, usually spiced with a regional *baharat* (see pp.23 and 26), but enlivened here with North African *harissa* paste. In a twist on the paste's usual recipe, dill seeds replace caraway, black lime supplants preserved lemon, and the rich smokiness comes from chipotle instead of smoked paprika.

## SPICE IDEAS

Try swapping dill for other spices on the **aniseed spectrum**, such as anise, star anise, allspice, or licorice.

Experiment with different **sweet-sour substitutes** for black lime, such as sumac, barberry, amchoor, anardana, tamarind, or lemon myrtle.

Draw on the **wide range of chilis** available, fresh and dried, to vary the degrees of heat, smokiness, and flavor complexity.

*Serves 2–3*

*Prep time 10 mins*

*Cooking time 30 mins*

### For the harissa

5 large red chilis  
1 red bell pepper  
1 tbsp chipotle chili paste  
½ tsp dried chili flakes  
½ tsp cumin seeds, toasted and ground  
½ tsp dill seeds, toasted and ground  
2 large garlic cloves, crushed  
1½ tsp red wine vinegar  
3 tbsp olive oil  
pinch of sea salt  
½ tsp black lime powder

### For the omelette

1 tbsp olive oil, plus extra for dressing  
1 zucchini, grated  
large handful Italian flat-leaf parsley, chopped  
large handful mint leaves, chopped  
1 tbsp harissa (use extra for more heat)  
1 cup (200 g) feta cheese, drained and roughly chopped  
sea salt and black pepper  
4 large eggs, lightly beaten and seasoned with sea salt and black pepper

### To serve

pita bread and a radish and green leaf salad, dressed in olive oil and *za'atar* (see recipe p.22)

**1** First make the harissa paste: Preheat the oven to 400°F (200°C). Place the chilis and bell pepper on a lightly oiled baking sheet and roast in the oven – 15–20 minutes for the chilis, and around 30 minutes for the bell pepper – turning a few times until tender and lightly charred.

**2** Remove from the oven and place in a sealed plastic bag for a few minutes to help to loosen the skin. Once they are cool enough to handle, pat them dry and peel. Seed the bell pepper and roughly chop, along with the chilis.

**3** Blend the chilis and bell pepper in a food processor, then add the rest of the harissa ingredients and blend until smooth. Dilute with a little water if the mixture is too thick. Transfer to a small, clean glass jar, seal, and store in the refrigerator. You will have enough harissa for 15 tablespoons, and it will keep for about a week in the refrigerator.

**4** Now make the omelette: Set the grill to high heat. Place a medium frying pan over medium heat, add the olive oil, and cook the grated zucchini for 4–5 minutes, stirring, until it starts to soften and turns slightly golden.

**5** Sprinkle over the herbs, dot the harissa around, and then add the chopped feta and a grind or two of black pepper. After 30 seconds, pour in the eggs and cook for 3–4 minutes, until the base is firm but the top is still liquid. Transfer to the grill and cook for 1–2 minutes, until the omelette is risen but still slightly gooey.

**6** Serve stuffed into pita bread with a *za'atar*-dressed radish and green leaf salad.







# ANNATTO

*Peppery | Earthy | Sweet*

## BOTANICAL NAME

*Bixa orellana*

## ALSO KNOWN AS

Achiote, bijol, lipstick tree, *roucou*, *urucu*

## MAIN FLAVOR COMPOUND

Germacrene

## PARTS USED

Seeds

## METHOD OF CULTIVATION

Seed pods are harvested when ripe pods have split to reveal the triangular seeds.

## COMMERCIAL PREPARATION

The ripe pods are dried, then beaten with sticks to remove the seeds, and finally carefully winnowed by hand or machine.

## NON-CULINARY USES

Fabric dye; coloring agent in cosmetics and medications; in traditional South American and Ayurvedic medicine.

### The plant

Annatto is a tropical evergreen shrub or small tree in the achiote family.

Each prickly red fruit capsule contains about 50 seeds, covered in red waxy pulp

Heart-shaped glossy leaves with reddish veins

Seeds are bright red in colour and yield a vivid orange-yellow dye



### Whole

The angular seeds are too hard to grind without a very powerful blender, and should be removed before serving. Store for up to three years.

### Powder

Ground annatto has a fainter aroma and milder flavour, but is easier to use and yields colour faster than whole seeds. The powder has a shelf-life of one year.



## Spice story

This New World spice, sometimes called “poor man’s saffron,” has been used as a natural dye for centuries. The Mayan Indians of Central America made a red paste from the brightly colored seeds to paint on their bodies in preparation for battle. Annatto was also used by early Aztec civilizations as a ceremonial pigment, and apparently as a means of protecting the skin from sunburn. The Aztecs added annatto to hot drinks to color their mouths red—hence the common name “lipstick tree.” By the 17th century, this spice had arrived in Europe and was being used as a food coloring agent. It subsequently became a popular means of giving cheese and smoked fish products an attractive golden-orange color—a practice that continues to this day.



### Region of cultivation

Annatto is native to the Caribbean and tropical South America. It is also cultivated in the Philippines, Sri Lanka, India, Africa, and Asia.

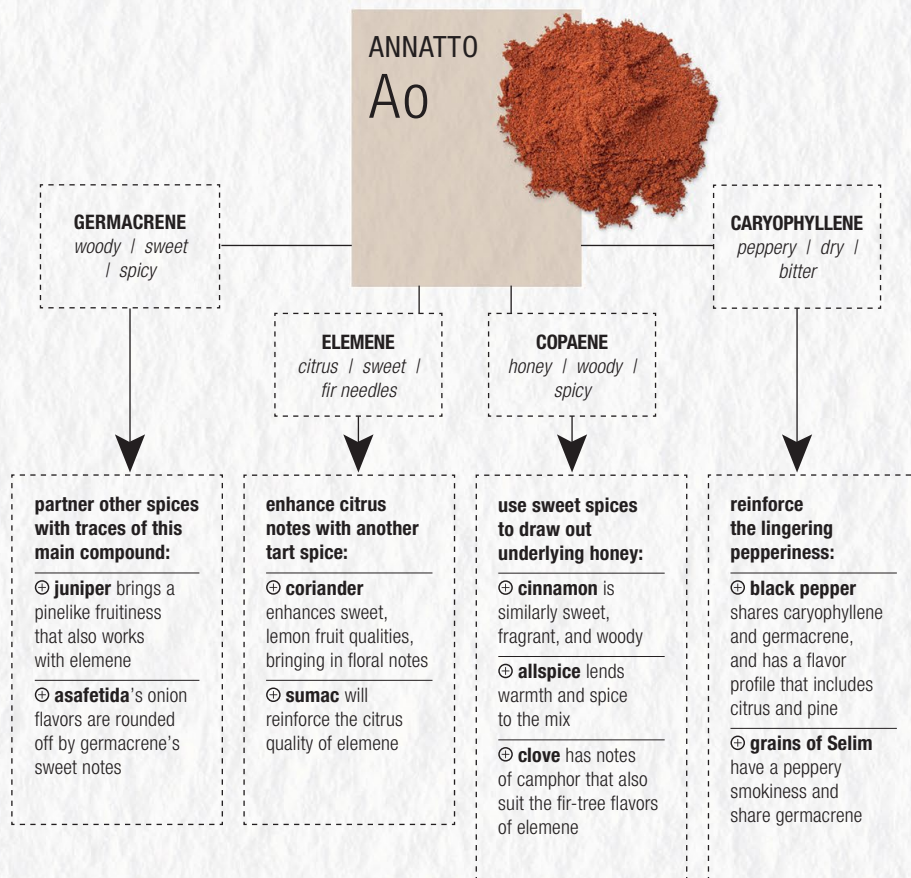


## Kitchen creativity

Often employed solely for its staining ability, annatto is not just about color, and can bring a peppery, slightly citrus, almost smoked-earth flavor to dishes.

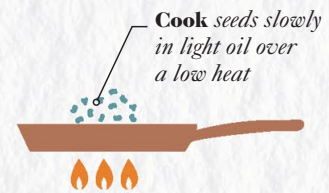
### BLENDING SCIENCE

The gently flavored terpene family of compounds provide much of annatto's taste, in the form of germacrene, elemene, and copaene, all of which possess an underlying sweetness. The contrasting peppery, bitter edge to annatto comes from caryophyllene.



### RELEASE THE FLAVOR AND COLOR

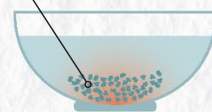
Whole annatto gives the best flavor, but the hard, dense seeds need time for the flavor molecules to escape, and must be removed before serving. For these reasons, it is best to cook with oil or water flavored by the seeds.



#### Infusing in oil

Annatto oil has a stronger taste because most flavor compounds dissolve best in oil. The oil-loving bixin pigment is plentiful, so cooking with fat will give the strongest coloring.

Steep the seeds for at least an hour



#### Steeping in water

Use more seeds than for infusing oil, as flavor compounds dissolve less readily in water, and the water-solvent norbixin pigment is four times less abundant than bixin.

### FOOD PARTNERS

- ⊕ **Sweet corn** Drizzle annatto-infused oil over hot corn on the cob.
- ⊕ **Rice** Use annatto-steeped water instead of saffron in Spanish rice with chicken.
- ⊕ **Fish** Steep the seeds in hot oil and then use the oil to fry fish cakes or fritters.
- ⊕ **Chocolate** Add a pinch of ground annatto, cinnamon, and chili to chocolate mousse.
- ⊕ **Meat** Use achiote paste in a marinade for chicken, pork, or beef before slow cooking and serving the meat "pulled" in tacos or tostadas.



# MASTIC

*Pinelike | Resinous | Woody*

**BOTANICAL NAME**

*Pistacia lentiscus*

**ALSO KNOWN AS**

Arabic gum (not to be confused with gum arabic), *mastiha*, lentisk.

**MAJOR FLAVOR COMPOUND**

Pinene

**PARTS USED**

Resin

**METHOD OF CULTIVATION**

The tree's bark is scored in late summer to exude resin. Trees produce resin at 5 years and can continue for 60 years.

**COMMERCIAL PREPARATION**

Resin gradually hardens at the base of the tree into pear-shaped "tears," which are collected, cleaned, and dried.

**NON-CULINARY USES**

In cosmetics and perfumery; in traditional medicine for treating wounds.


**The plant**

Mastic is harvested from small evergreen trees in the sumac family, closely related to pistachios.

**Inedible berries turn from red to black**

**Grows to 6½–20 ft (2–6 m) high**

**Color is light ivory at first, darkening to golden-yellow due to reaction with sunlight and air**


**Resin "tears"**

Hard, translucent pieces are used in cooking and called *dahtilidopetres* (flint stones). Lower-grade, softer, larger tears are called *kantiles* (blisters) and are mainly used for chewing.

## Spice story

The tree that produces mastic grows only on the Greek island of Chios, where this unique product has been cultivated for more than 2,500 years. The Ancient Greeks and Romans chewed it as a breath freshener—it is the origin of the word "masticate." When the Genoese took Chios from the Venetians in 1346 CE, they provided the islanders with protection from pirates in return for a monopoly over the lucrative mastic trade, which was by then a highly sought-after spice. In 1566, the Ottoman Turks seized control of the island and controlled mastic trade until Chios became part of the Greek state in 1913. Today, the 24 remaining mastic-producing villages—known as *mastichochoria*—harvest and process the resin in the same time-honored way. Chios mastic is now a product of Protected Designation of Origin (PDO) and most of it is exported to Turkey and the Middle East.


**Region of cultivation**

Mastic trees are native to the Mediterranean and the resin is harvested exclusively on the Greek island of Chios.

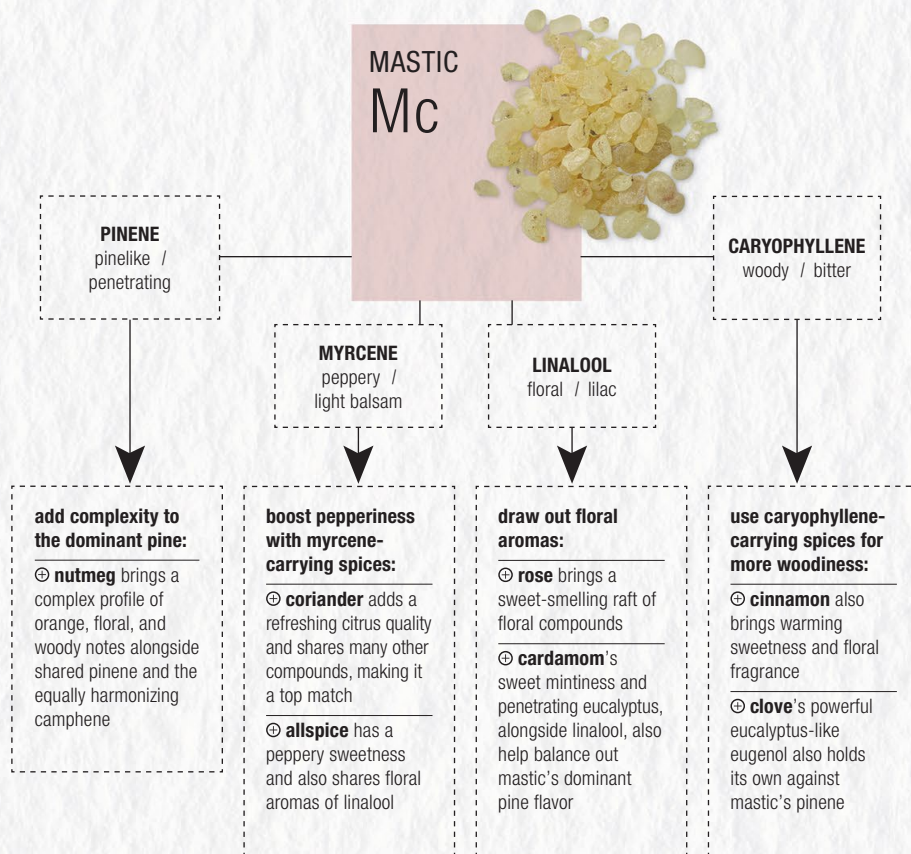


## Kitchen creativity

In Turkey, mastic is added to Turkish delight; in Lebanon, it flavors a slightly chewy, eggless ice cream, scented with rosewater. In Egypt, it is added to red meat and poultry dishes, often along with cardamom.

### BLENDING SCIENCE

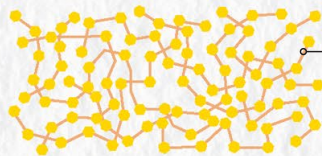
Mastic's subtle aroma is mostly due to the flavor compound pinene, which comprises up to 80 percent of its chemical make up. Lesser amounts of myrcene and other terpene compounds give opportunities to partner mastic with a wide variety of savory, sweet, or woody spices.



### Plastic mastic

Adding whole mastic to a cooking broth runs the risk of creating a gluey plastic paste stuck to the bottom of the pan.

**Mixed with water**, myrcene flavor molecules in mastic clasp on to one another very rapidly to form long chains, or polymers, which tangle together into a sticky mass.



*Microscopically thin cables are similar to those found in natural and man-made plastics and rubbers*

### FOOD PARTNERS

- ⊕ **Fruit preserves** Add a little mastic to apple jelly or fig jam.
- ⊕ **Roast lamb** Rub a joint of lamb with mastic, crushed onion and garlic, and some cardamom before roasting.
- ⊕ **Bread** Add a teaspoon of ground mastic and some fennel seeds to a savory bread dough
- ⊕ **Sweet baked goods** Add mastic to macaroons—mastic pairs happily with almonds—or to rosewater-scented sponge cake.
- ⊕ **Rice pudding** Make a mastic-scented rice pudding and drizzle with an orange blossom-flavored syrup.

### RELEASE THE FLAVOR

Mastic is best ground before use and mixed with another powdery ingredient so that it is dispersed throughout the dish.



**Grind with sugar** for a sweet recipe, or salt for savory dishes, or flour for either. This also stops the mastic sticking to the grinder.



**Try adding** mastic to dishes via a sauce made from a roux of flour, mastic, and butter or other fats.



# JUNIPER

*Resinous | Sharp | Floral*

**BOTANICAL NAME**

*Juniperus communis*

**ALSO KNOWN AS**

Common juniper

**MAJOR FLAVOR COMPOUND**

Pinene

**PARTS USED**

Berries (actually cones, like those on pine trees, but with fleshy scales)

**METHOD OF CULTIVATION**

Shrubs are grown on chalky soils. Berries are harvested in late summer or autumn.

**COMMERCIAL PREPARATION**

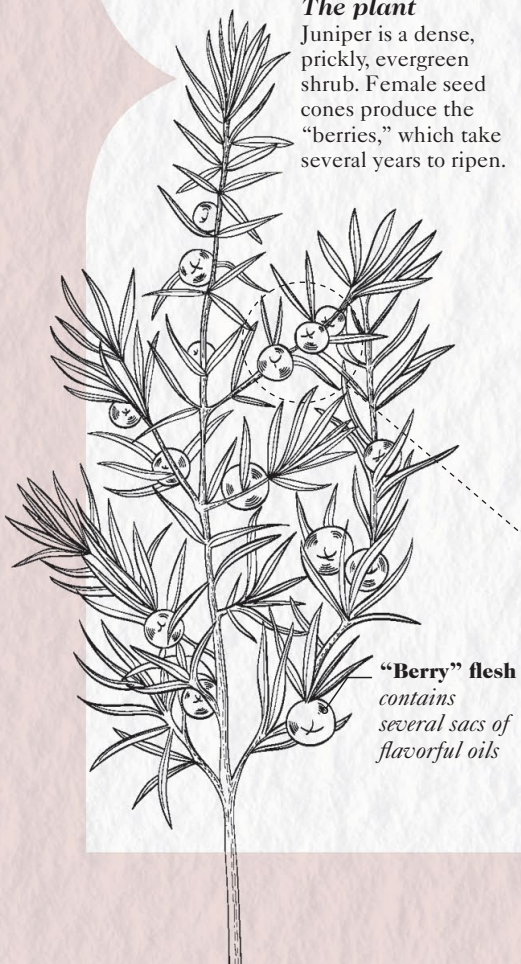
Berries are often partially dehydrated at a temperature below 95°F (35°C) to limit the evaporation of essential oils, which contain the flavor compounds.

**NON-CULINARY USES**

In perfumes; as a fabric dye; as an insecticide. In traditional medicine, as a diuretic and anti-inflammatory.

**The plant**

Juniper is a dense, prickly, evergreen shrub. Female seed cones produce the “berries,” which take several years to ripen.



“Berry” flesh contains several sacs of flavorful oils


**Ground**

Berries are available roughly ground, but the flavor-containing oils soon degrade and the spice needs to be used quickly.

*Oiliness of the berry indicates good quality*

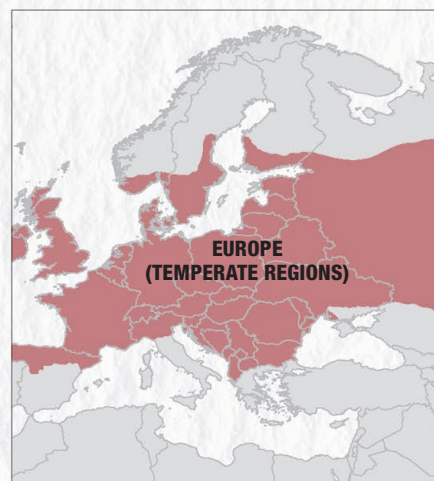
*Each berry contains 6 black seeds*


**Whole**

The berries are available fresh, but more commonly bought semi-dried. Store in a sealed container because the oils evaporate easily; best used within six months.

## Spice story

In folklore, juniper is associated with healing and magical powers, and the dense shrub is known as a place of safe refuge; in one legend the infant Jesus is concealed in a juniper hedge to hide him from King Herod’s soldiers. Since ancient times, branches of the bush have been burned to smoke meat and fish, and in the Middle Ages the wood was burned to purify the air in times of plague. Italy has been exporting home-grown juniper for more than 500 years. Most of the country’s crop goes straight to distilleries for making gin, and it is still a legal requirement for juniper to be the dominant aromatic in all gins. The Dutch in the 13th century appear to have been the first to flavor spirits with juniper, using the green, unripe berries to produce a strongly alcoholic drink they named *jenever*.


**Region of cultivation**

Juniper is native to temperate regions of Europe, Russia, and the Caucasus, North America, and Japan. The strongest-tasting berries are grown in warm, sunny, southern Europe.

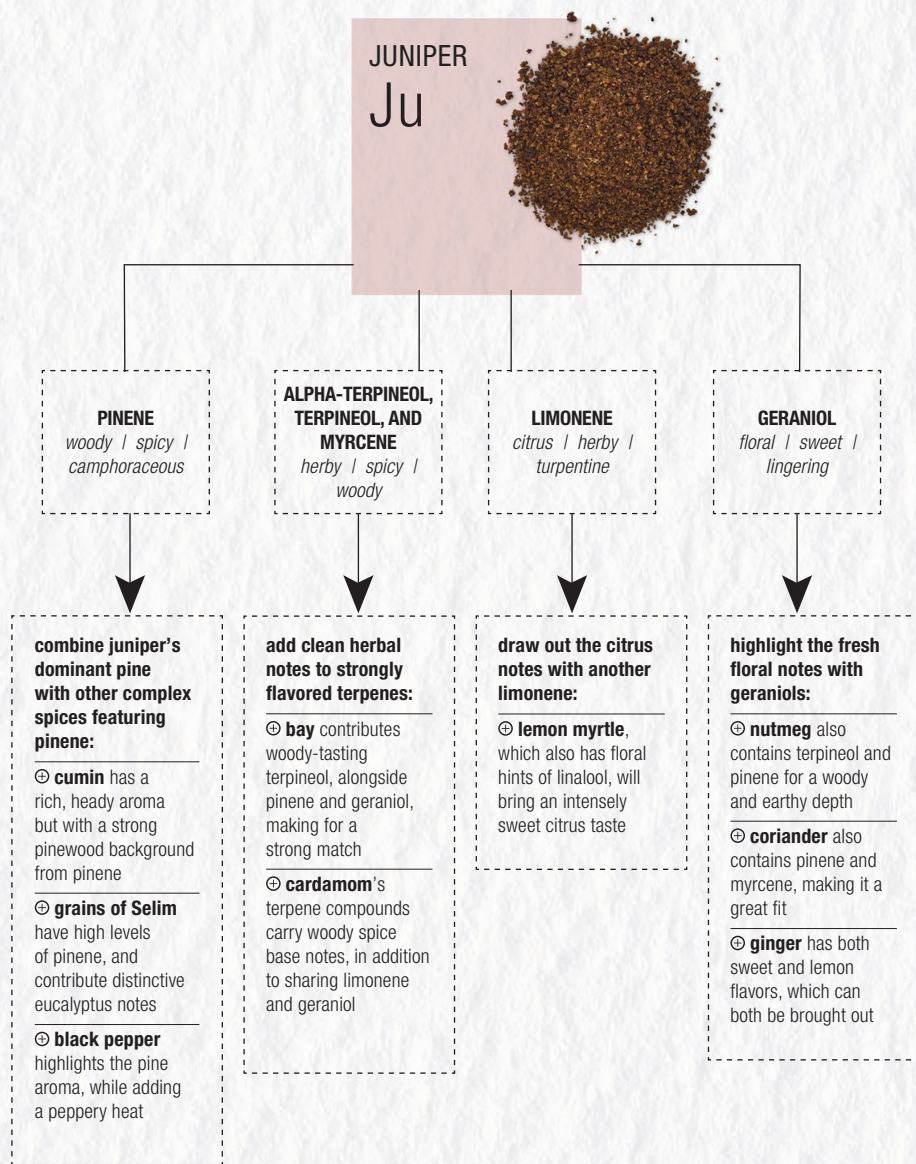


## Kitchen creativity

Juniper has a sweet taste with a strong aroma of pine and hints of turpentine. Its clean, citrus qualities make it particularly well suited to meat, on which its acids have a mild tenderizing effect.

### BLENDING SCIENCE

Juniper's principal flavor—light, woody pine—reflects the coniferous tree from which it originates; fragrant terpene compounds make up 80 percent of juniper's flavor oils, with the pinewood aroma of pinene foremost. This range of pleasantly fragrant terpenes, combined with juniper's high sugar content (up to 33 percent), provide ample blending opportunities.



### FOOD PARTNERS

- ⊕ **Cabbage, beets** Add crushed berries to coleslaw, along with slivers of tart apple; mix with salt and sprinkle over beets before roasting.
- ⊕ **Citrus fruits** Flavor citrus preserves with a couple of crushed berries, or top lemon sorbet with a small pinch.
- ⊕ **Meat** Use in marinades, rubs, and stuffing for most meats, particularly game. Drop crushed berries into casseroles and stews, with a strip of orange peel.
- ⊕ **Salmon** Juniper's resinous qualities work well with oily fish: include it in a homemade cure for salmon gravlax.
- ⊕ **Chocolate** Stir crushed berries into a truffle or mousse cake mixture.

### RELEASE THE FLAVOR

Juniper berries don't need roasting, but do benefit from crushing or grinding to speed the rate at which the terpene-rich oils spread through a dish.



**Crush berries** just before using them; compounds soon evaporate when the oil sacs are broken.



**Terpenes** from the oil dissolve poorly in water but spread easily through oil and alcohol.



**Meat rubs** of crushed juniper give a strong taste as the surface fats disperse the flavors.



# ROSE

*Floral | Musky | Sweet*

## BOTANICAL NAME

*Rosa x damascena*  
(most commonly used species)

## ALSO KNOWN AS

Damask rose

## MAJOR FLAVOR COMPOUND

Geraniol

## PARTS USED

Dried buds or petals

## METHOD OF CULTIVATION

Buds and flower heads are harvested by hand. For petals, they are picked before or at sunrise on the first day in full bloom.

## COMMERCIAL PREPARATION

Buds and petals are dried to sell as a spice, or distilled to produce rose oil.

## NON-CULINARY USES

In perfumery and cosmetics; in traditional herbal medicine as an antidepressant and antiseptic, and to treat anxiety.

### The plant

The damask rose is a hardy flowering shrub and the main source of rose flavoring used in cooking, although *Rosa rugosa* is popular in China, Japan, and Korea.

A bush can be productive for up to 40 years

Petals ▶



◀ Buds



### Petals and buds

These are available dry for use as a spice, or crystallized for decorating cakes and desserts.

## Spice story

The rose was first cultivated about 5,000 years ago by the ancient civilizations of China, who prized the flower for its beauty, perfume, and healing properties. The Romans grew roses extensively and documented their medicinal uses, including (when worn as a floral crown) protection from hangovers. In the 7th century CE cultivation of roses spread throughout the Middle East. Around this time the Persians discovered how to extract oil from the flower, and its culinary use became more widespread. By the Middle Ages, roses were used at medieval banquets to perfume water for hand washing, and to flavor savory and sweet dishes. During the Crusades, the highly scented damask rose, the main source of rose oil, reached northern Europe. In Victorian England, rose-petal sandwiches were considered a refined teatime treat.



### Region of cultivation

The rose is native to temperate regions of the northern hemisphere, probably originating in China; the damask rose is native to the Middle East. It is cultivated in Turkey, India, Iran, Bulgaria, and Morocco.

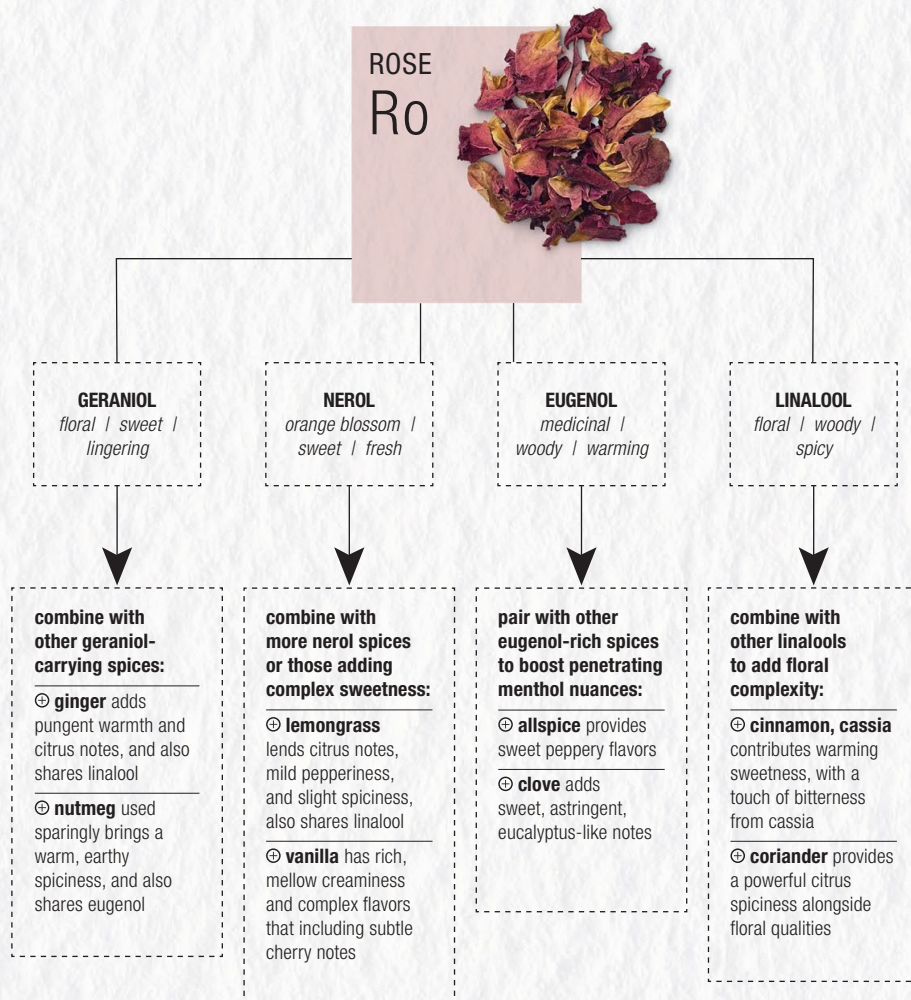


## Kitchen creativity

Rose petals add sweet floral aromas to both sweet and savory dishes. The petals of any unsprayed scented rose can be used, but those cultivated specifically for consumption have a more potent flavor than garden roses.

### BLENDING SCIENCE

Rose's flavor profile is dominated by terpene flavor compounds that have a sweet, floral character, including geraniol, nerol, eugenol, and linalool. The unique rose aroma is produced by potent flavor compounds called "rose ketones," which provide fresh green notes, herby spiciness, woody sweetness, and berrylike notes.

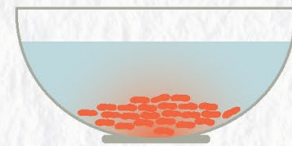


### FOOD PARTNERS

- ⊕ **Cherries** Add to stewed cherries and use instead of jam in a tart.
- ⊕ **Vegetables** Add dried petals to harissa and serve with grilled vegetables.
- ⊕ **Chicken** Sprinkle crushed petals into a Moroccan-style chicken stew.
- ⊕ **Mackerel** Serve grilled mackerel with couscous scented with ground rose petals.
- ⊕ **Shortbread** Add a few crushed dried rose petals to the dough for shortbread cookies.
- ⊕ **Ice cream** Use ground petals or rosewater to make rose ice cream.

### RELEASE THE FLAVOR

Rose's most potent flavor compounds are oil-soluble, but can easily overpower a dish: this is one spice that benefits from being used in a water-based way. Even so, rosewater contains several hundred flavor compounds, which give it a complex subtle flavor.



**Make your own** rosewater by steeping rose petals in water. Allow several days for the flavor compounds to slowly dissolve into the liquid.

### BLEND TO TRY

Use and adapt this classic blend, suitable for sweet or savory dishes:

*Advieh* p.27



# CORIANDER

*Citrus | Floral | Warming*

## BOTANICAL NAME

*Coriandrum sativum*

## ALSO KNOWN AS

Cilantro; sometimes mistakenly called Indian, Chinese, or Japanese parsley

## MAJOR FLAVOR COMPOUND

Linalool

## PARTS USED

"Seeds" (in fact fruits), leaves, and roots

## METHOD OF CULTIVATION

Grown in fields as an annual crop; the fruits form on the plant about three months after sowing.

## COMMERCIAL PREPARATION

Stalks are cut before the fruits are fully ripe. Fruits are threshed, cleaned and dried.

## NON-CULINARY USES

Essential oil in perfumes and cosmetics. Also used as traditional remedy for ulcers and stomach problems.

### The plant

Coriander is a hardy herbaceous annual plant. There are two main cultivated varieties: *vulgare* (Indian) and *microcarpum* (European).

Pink-tinged or white flowers develop into the fruits of the spice

Edible roots are used in Thai cooking



◀ European

European fruits have a higher essential oil content

The husk of each fruit contains two seeds



▲ Indian

### Whole

The small, round European fruits are more citrusy than the larger, oval fruits of Indian coriander, which have a sweet and slightly creamy taste. Store for up to a year.

### Powder

Pre-ground coriander loses its aroma quickly, and it is preferable to grind whole seeds as required. Store for up to four months.

Ground coriander can also act as a thickener



## Spice story

The discovery of an 8,000-year-old stockpile of the spice in the Nahal Hemar cave in Israel, together with evidence from Egyptian tombs, suggests coriander has its origins as a commercial crop in the Near East. The Greeks and Romans used it as a medicine and a meat preservative, as well as a spice in dishes such as lentils with chestnuts. The spice traveled to India via Persia around 2,000 years ago, and four centuries later evidence points to its widespread use from China to Anglo-Saxon Britain. Early European settlers took the spice to North America, where it became naturalized and widely cultivated. By the 18th century, the spice had fallen out of favor in Europe, and its use became largely limited to gin distilling and beer brewing; it is still a popular flavoring in Belgian beers.



### Region of cultivation

Native to the Mediterranean and southern Europe, coriander is now cultivated extensively throughout the world, for both seed and leaves. The main centers of production are in India and Russia, with large exports from Morocco, Romania, Iran, China, Turkey and Egypt.

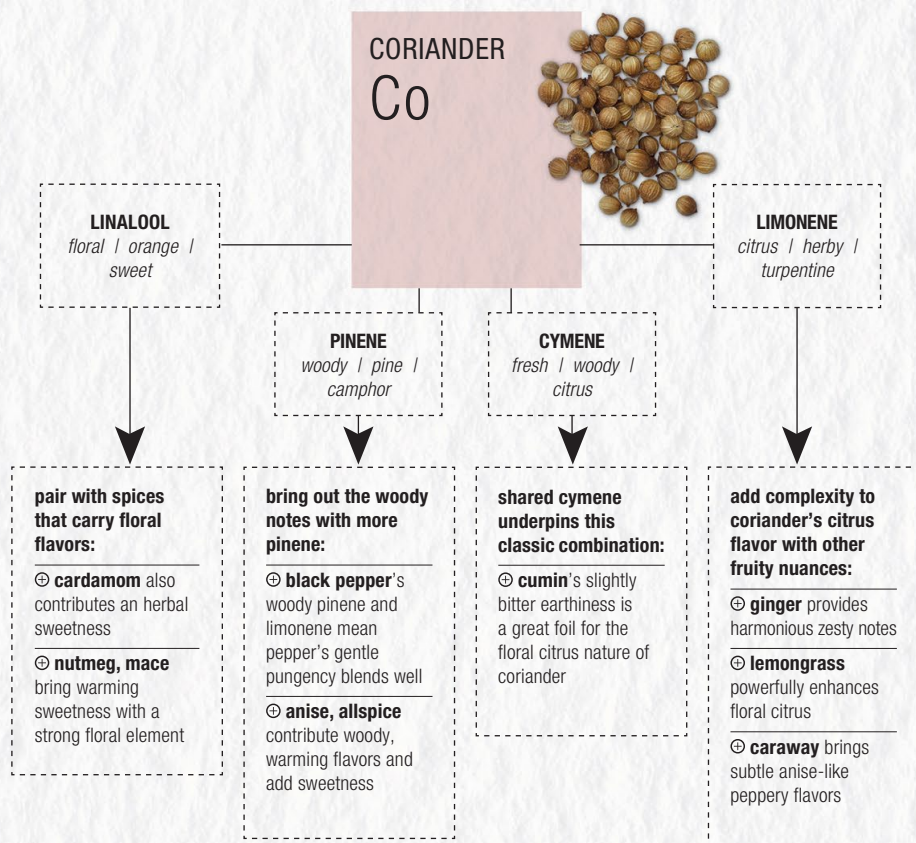


## Kitchen creativity

Coriander is a versatile spice with a bittersweet taste reminiscent of dried orange peel. While it can be used on its own, the spice is more frequently paired with earthy cumin to form the backbone of savory blends the world over.

### BLENDING SCIENCE

Lilac-scented linalool dominates the flavor profile of coriander, followed by a variety of mildly flavored terpenes, including pinene, cymene, and limonene, making it a versatile spice for pairing.



### FOOD PARTNERS

- ⊕ **Celery, fennel, cabbage** Toss a few crushed seeds into coleslaw or when braising.
- ⊕ **Citrus, apples, pears** Add toasted and ground to citrus sorbets and to crumble topping or pastry dough for apples and pears.
- ⊕ **Pork, game, chicken** Use as a dry marinade or rub, or in stuffing mixtures.
- ⊕ **Tuna and shellfish** Rub ground over tuna steaks before searing, or add whole to a court-bouillon for poaching shellfish.
- ⊕ **Preserves** Works well as a pickling spice, and in tomato relish and marmalade.
- ⊕ **Sponge cake** Add a pinch to plain sponge; it also works beautifully with citrus, blueberries, or blackberries.

### BLENDS TO TRY

Try these recipes for classic blends featuring coriander, or why not adapt them with some blending science?

*Zhug* p.24

*Dukkah* p.28

*Durban curry masala* p.37

*Malaysian fish curry paste* p.51

*Chimichurri* p.66

### RELEASE THE FLAVOR

Coriander's most flavorful oils are deep inside the seeds, and its taste profile changes greatly when the spice is toasted.



**Leave untoasted** to allow the green, floral flavors to dominate.

266°F (130°C) –  
356°F (180°C)



**Toast** to a deep brown color to develop nutty, earthy pyrazines.



**Crack open or grind** seeds to release the oils, especially for quick-cooking dishes.



# WEST AFRICAN PEANUT CURRY WITH DURBAN MASALA

Inspired by the peanut soups and stews of West Africa, this recipe foregoes the usual fiery Scotch bonnet chilies for a twist from South Africa's Eastern Cape—a Durban curry masala spice blend. The heat comes mainly from the cayenne pepper, so use less for a milder kick. For a hearty soup, simply add more water at the end of cooking.

## SPICE IDEAS

**Blend your own masala:** swap in black cardamom or grains of Selim, for smokiness, or replace ginger or coriander with woody, balsamic mace.

Toast the whole spices to **create new toasted pyrazine flavors**, but take care, as they can dominate.

Add fresh spices to the frying vegetables for a **deeper base flavor:** the pungency of garlic and ginger will mellow and sweeten with prolonged cooking.

*Serves 6–8*

*Prep time 20 mins*

*Cooking time 25–35 mins*

### For the Durban masala blend

2 tsp cumin seeds  
1 tsp coriander seeds  
½ tsp fenugreek seeds  
seeds of 5 cardamom pods  
1 cinnamon stick  
5 cloves  
1 tsp cayenne pepper  
½ tsp ground ginger

### For the curry

4 tbsp unsweetened peanut butter  
2¼ cups (500 ml) water  
3 large carrots, peeled  
2 parsnips, peeled  
1 rutabaga or turnip, about 1 lb (500 g)  
2 tbsp oil  
1 medium onion, diced  
1 tbsp tomato purée  
2 ripe tomatoes, finely diced  
12 oz (400 g) mushrooms, wild, cultivated, or mixed  
2¼ cups (500 ml) vegetable stock  
4 baby eggplants or white garden egg eggplants (optional)  
salt and pepper to taste

**1** For the Durban masala, grind the whole spices and combine with the cayenne pepper and ginger. Set aside.

**2** Prepare the peanut butter by blending it with a cup of water in a food processor. Once it is smooth, pour into a pan and stir in the remaining water. Simmer on a low heat for about 15 minutes, until oil starts to gather on the surface. Set aside.

**3** Chop the carrots, parsnips, and rutabaga or turnip into 1 in (2–3 cm) chunks. Heat 1 tablespoon of the oil in a large pan. Add the vegetables and fry over medium–high heat for 10–15 minutes, only stirring occasionally, until the sides brown and caramelize. Remove from the pan and set aside.

**4** Heat the remaining oil in the pan and add the onion and masala. Sauté over medium heat for a few minutes, and then add the tomato purée and chopped tomatoes. Increase the heat to the maximum, add the mushrooms, and fry for 3 minutes.

**5** Add the vegetable stock, peanut sauce, and vegetables to the pan. Chop the eggplants (if using) into 1 in (2–3 cm) chunks and add. Bring to a boil, then simmer for 15–20 minutes, until the vegetables are tender.

**6** Check for seasoning and add salt and pepper. Remove any large, whole spices and serve the dish with sticky rice. Alternatively, to serve as a soup, add water and bring back to a boil.







# CUMIN

*Earthy | Herby | Woody*

**BOTANICAL NAME**

*Cuminum cyminum*

**ALSO KNOWN AS**

Roman caraway, *jeera*

**MAJOR FLAVOR COMPOUND**

Cuminaldehyde

**PARTS USED**

“Seeds”, which are technically fruits

**METHOD OF CULTIVATION**

Grown as an annual crop, plants are cut around four months after planting, when the fruits turn yellow-brown.

**COMMERCIAL PREPARATION**

Stalks are dried then threshed to separate fruits, which are then further dried.

**NON-CULINARY USES**

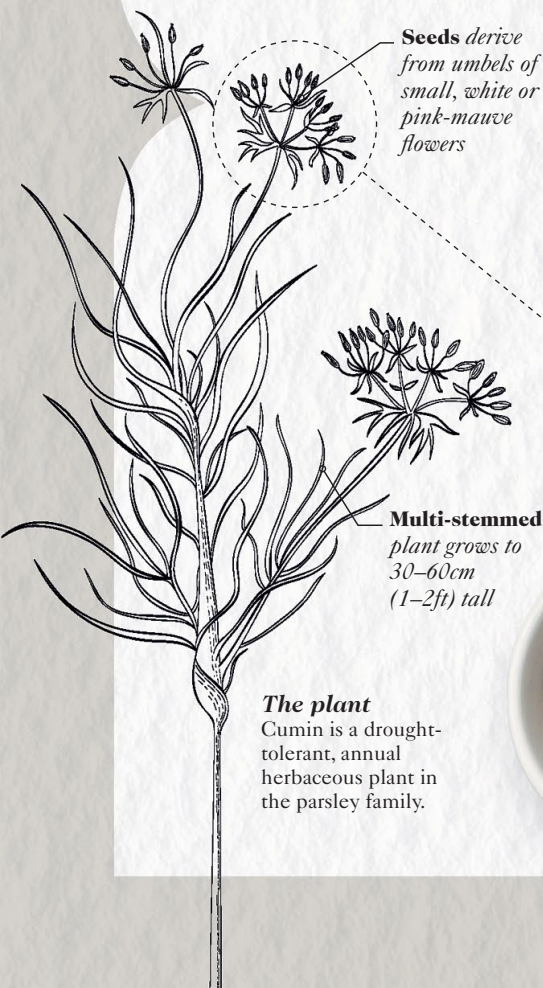
Essential oil in perfumes and veterinary medicines. In traditional medicine, taken to aid indigestion and relieve flatulence.

## Spice story

Evidence of cumin in Egypt's pyramids suggests that it was in use more than 5,000 years ago. The Ancient Greeks and Romans used cumin as a table seasoning alongside salt. Roman naturalist Pliny the Elder regarded it as the king of condiments, and in modern-day Georgia and Africa salt combined with cumin is still a popular seasoning. From the 7th century CE, Arab traders transported cumin on their spice caravans to North Africa and east to Iran, India, Indonesia, and China, and it became a key component of many regional spice mixes, including *baharat* (Middle East), *garam masala* and *panch phoran* (India), and *ras el hanout* (Morocco). Spanish conquistadors introduced cumin to the Americas in the 16th century, notably to Mexico, where the spice became deeply embedded in the cuisine.


**Region of cultivation**

Thought to be native to Egypt's Nile Valley and the Eastern Mediterranean, cumin is cultivated in India (the largest producer and consumer), China, Syria, Turkey, and Iran. Palestine and USA are other producers.



Seeds derive from umbels of small, white or pink-mauve flowers

Seeds measure around 6mm (1/4in) long

**Whole**

The boat-shaped, light brown seeds will keep their flavour for up to a year if stored in a sealed container somewhere cool and dark.

Multi-stemmed plant grows to 30–60cm (1–2ft) tall

**The plant**

Cumin is a drought-tolerant, annual herbaceous plant in the parsley family.

**Powder**

Buy ground cumin in small quantities, as it quickly loses its potency; use within a couple of months.

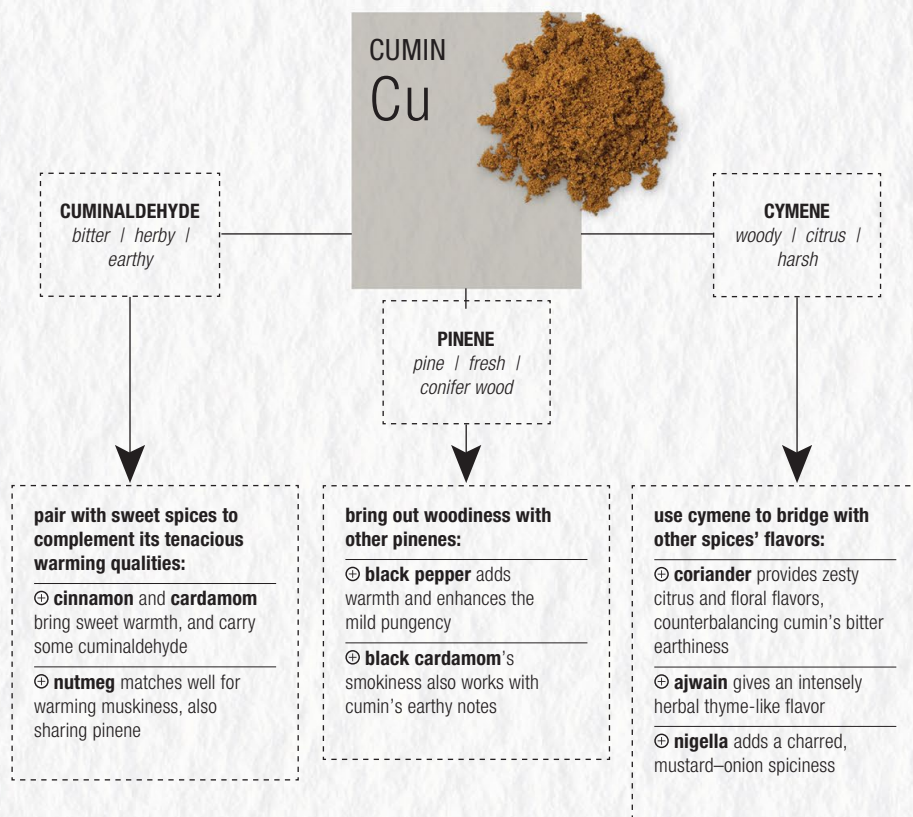


## Kitchen creativity

Cumin is an essential component of Indian, North African, Levantine, and Mexican cuisine. Used alone or in combination with other spices, it imbues a diverse range of savory dishes with its distinctive, highly aromatic, and pungent flavor.

### BLENDING SCIENCE

Cumin's uniquely musky, earthy, almost burnt flavor derives from cuminaldehyde, a compound found in roast beef and cinnamon but sparingly in other spices. Other important compounds include pinene, which gives the spice its dry, pinewood nuance, and cymene, which has a fresh, turpentine-like aroma.



### FOOD PARTNERS

- ⊕ **Eggplant and root vegetables**  
Toast and crush seeds for sprinkling over roasted eggplant, a beet dip, or puréed roots.
- ⊕ **Pulses** Use as a flavoring for dhal and other lentil stews, in falafel mix, and scattered over hummus.
- ⊕ **Beef and lamb** Add a pinch of ground cumin to minced lamb for Moorish-style kebabs, or to beef rendang, Mexican mole, and chili con carne.
- ⊕ **Salt** Toast seeds and then grind with an equal quantity of sea salt, for sprinkling over roast chicken, tomato salad, avocado toast, tacos, or roast potatoes.
- ⊕ **Yogurt** Combine cumin seeds, yogurt, and lemon to make a dressing for roasted vegetables or a salad of bitter leaves, such as mustard greens or kale.

### BLENDS TO TRY

Try these recipes for classic blends featuring cumin, or why not adapt them with some blending science?

**Turkish baharat** p.23

**Za'atar** p.22

**Advieh** p.27

**Dukkah** p.28

**Hawajj** p.29

**Chaat masala** p.42

**Shandong spice bag** p.58

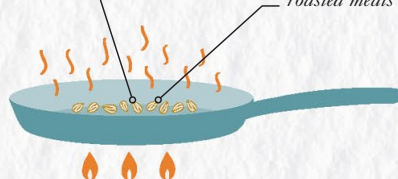
**BBQ rub** p.68

### RELEASE THE FLAVOR

Cumin is particularly responsive to toasting: bruise and dry fry the seeds to produce additional flavor compounds of pyrazines and sulfur.

Pyrazines bring mainly nutty, toasted flavors

Sulfur brings flavors of green vegetables and roasted meats





# NIGELLA

*Mild | Peppery | Herbaceous*

## BOTANICAL NAME

*Nigella arvensis*

## ALSO KNOWN AS

Love-in-a-mist, black onion seeds, black cumin, black caraway

## MAJOR FLAVOR COMPOUND

Nigellone

## PARTS USED

Seeds

## METHOD OF CULTIVATION

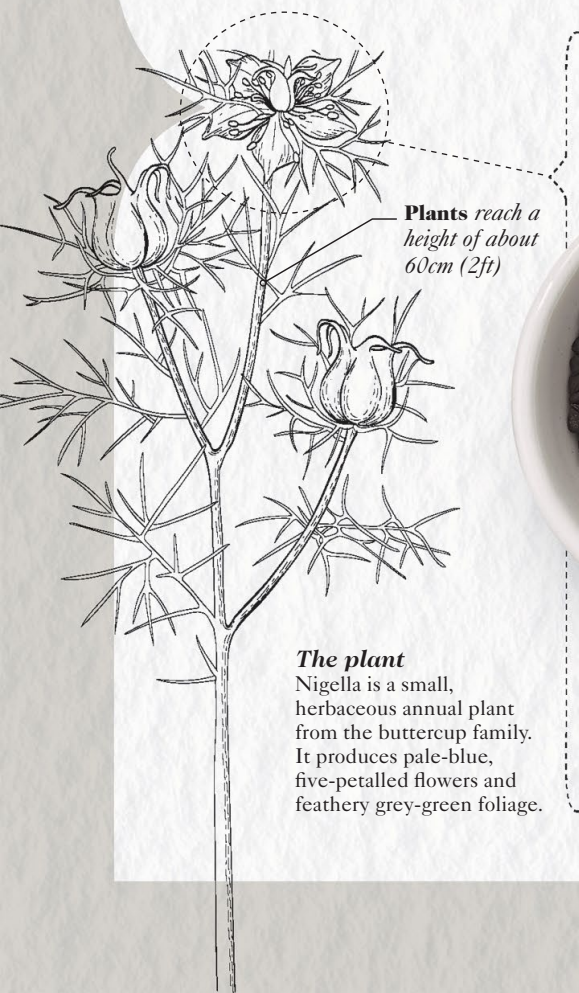
An annual plant, it produces large seed capsules that are harvested as they ripen.

## COMMERCIAL PREPARATION

The capsules are dried, then gently crushed to release the seeds, which are sold whole or have their oil extracted.

## NON-CULINARY USES

In natural remedies the seeds are used to alleviate cold symptoms, treat digestive ailments, and encourage lactation.

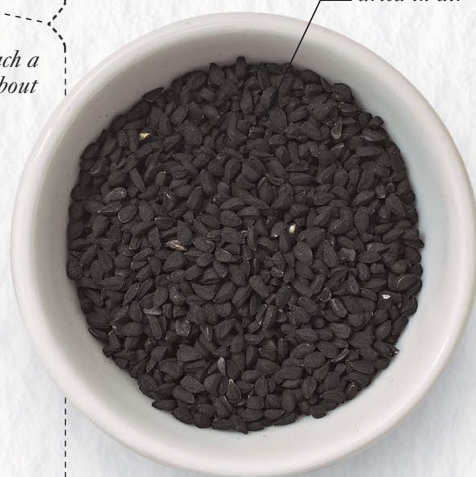


Plants reach a height of about 60cm (2ft)

### The plant

Nigella is a small, herbaceous annual plant from the buttercup family. It produces pale-blue, five-petaled flowers and feathery grey-green foliage.

Tear-drop shaped seeds are beige until dried in air



### Whole

Seeds will keep for up to two years. They are very hard, so grind them in a spice or coffee grinder rather than by hand with a pestle and mortar.

## Spice story

Reputedly found in King Tutankhamun's tomb in Egypt, nigella has been cultivated for its seeds for more than 3,000 years. Its name derives from the Latin *nigellus* or *niger* (black). Ancient Greeks and Arabs appreciated the seed's curative and preservative properties; according to an Arab proverb, nigella is "a remedy for all diseases except death." An ancient Arab text describes it as *habbatul barakah*, "seed of blessing," while in the Old Testament it is called *ketzah*. The Roman physician and philosopher, Galen, prescribed nigella seeds to treat colds, and they are still used in this way: a spoonful of seeds is wrapped in muslin, held to the nostril, and inhaled to clear a blocked nose. Nigella has been used as an herbal remedy across southern Europe, western Asia, and the Middle East.



### Region of cultivation

Native to southern Europe, Turkey, the Caucasus, and the Middle East, nigella is now cultivated in India—the largest modern-day producer—and Egypt, North Africa, and southern Asia.

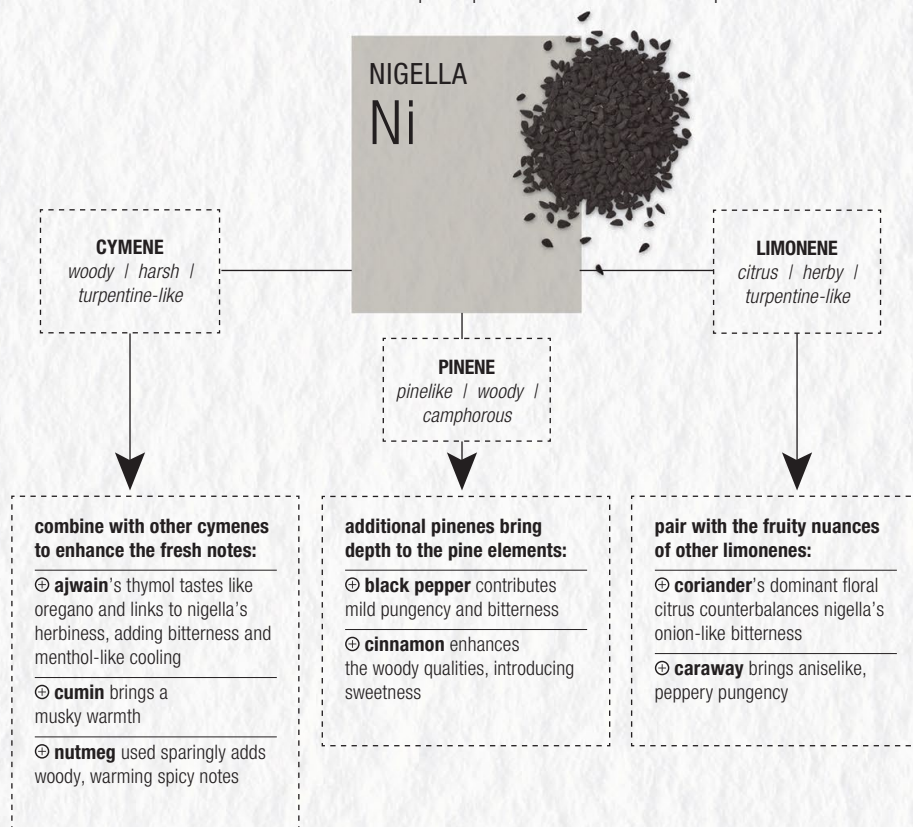


## Kitchen creativity

*Nigella* is a punchy spice that releases a mild heat on the tongue and has a slightly bitter, herby, charred onion–like flavor. It is widely used in Indian cooking and its preservative properties make it a fine pickling spice for fruit and vegetables.

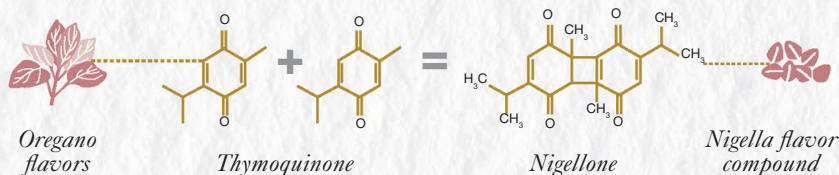
### BLENDING SCIENCE

Look to the secondary flavor compounds of *nigella* for effective spice pairings: significant concentrations of cymene give the spice its earthy, fresh aroma, and smaller amounts of the mild terpenes pinene and limonene are also present.



### The oregano connection

*Nigella's* main flavor compound—nigellone—is almost unique in nature, yet many people detect a similarity with oregano. The explanation is that nigellone forms from the sticking together of molecules of thymoquinone, a medicinal-tasting compound that is also found in oregano.

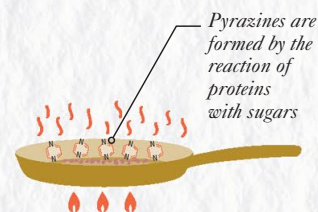


### FOOD PARTNERS

- ⊕ **Vegetables** Add to vegetarian curries made with root vegetables, squash, or eggplant.
- ⊕ **Grains and pulses** Flavor rice and bulgur wheat with lightly toasted seeds; fry briefly in oil or ghee and stir into just cooked dhal.
- ⊕ **Eggs** Sprinkle over scrambled or fried eggs.
- ⊕ **Breads** Combine with white sesame seeds and stir into flatbread dough or sprinkle on top. Also works well with rye breads.
- ⊕ **Goat cheese** Work the seeds into a cheese dip made with whipped feta or other goat cheese.
- ⊕ **Lamb** Use in a slow-braised Indian korma or Moroccan tagine.

### RELEASE THE FLAVOR

*Nigella* seeds are hard to break, and their flavorful oils are locked away in minute capsules. One way to help the oils escape is by grinding seeds, then toasting in a dry frying pan, which also generates additional pyrazine flavour compounds.



### BLEND TO TRY

Try this recipe for a classic blend featuring *nigella*, or why not adapt it with some blending science?

**Panch phoran** p.43



# GRAINS OF SELIM

*Musky | Resinous | Bitter*

## BOTANICAL NAME

*Xylopia aethiopica*

## ALSO KNOWN AS

Uda pod, Ethiopian pepper, *habzeli*, kimba pepper, *Selem kili*, Guinea pepper

## MAJOR FLAVOR COMPOUND

Fenchone

## PARTS USED

Pods (fruits) and seeds

## METHOD OF CULTIVATION

Trees are harvested for their pods, which are picked at various stages of maturity.

## COMMERCIAL PREPARATION

In Senegal, immature fruits are smoked and then pounded; elsewhere, the sun-dried pods are ground or used whole.

## NON-CULINARY USES

In traditional African medicine: fruit and/or roots are used to treat a variety of complaints. Bark extract is used in skin ointments.

## The plant

Grains of Selim come from an evergreen tree, which grows in humid tropical regions of Africa. Trees can grow to a height of 98 ft (30 m).

Seed pods form in dense clusters

Pods are dark brown and contain five to eight seeds



## Whole

Pods can be used whole and removed from the dish before serving.

## Powder

Grind your own pods and use immediately, since the flavors evaporate quickly and for this reason pre-ground powder is rarely available.



## Spice story

Grains of Selim are a popular spice across Africa, from Ethiopia to Ghana. Like grains of paradise, during the Middle Ages the spice was exported north to Europe and sold as a substitute for scarce and expensive black pepper. However, its popularity in Europe waned from the 16th century—by then, Portuguese sailors and merchants had established sea trade routes from Asia to Europe, and this vastly improved the availability of black pepper and other exotic spices. Outside its indigenous regions, the spice is often called Ethiopian pepper, but it is no relation to *Piper nigrum*. It is valued as both a culinary spice and a medicine in Africa, particularly southern Nigeria, and deserves to be better known outside the continent.



## Region of cultivation

The spice is native to Ethiopia and is cultivated there, as well as in Kenya, Uganda, Tanzania, Nigeria, Ghana, and Senegal.

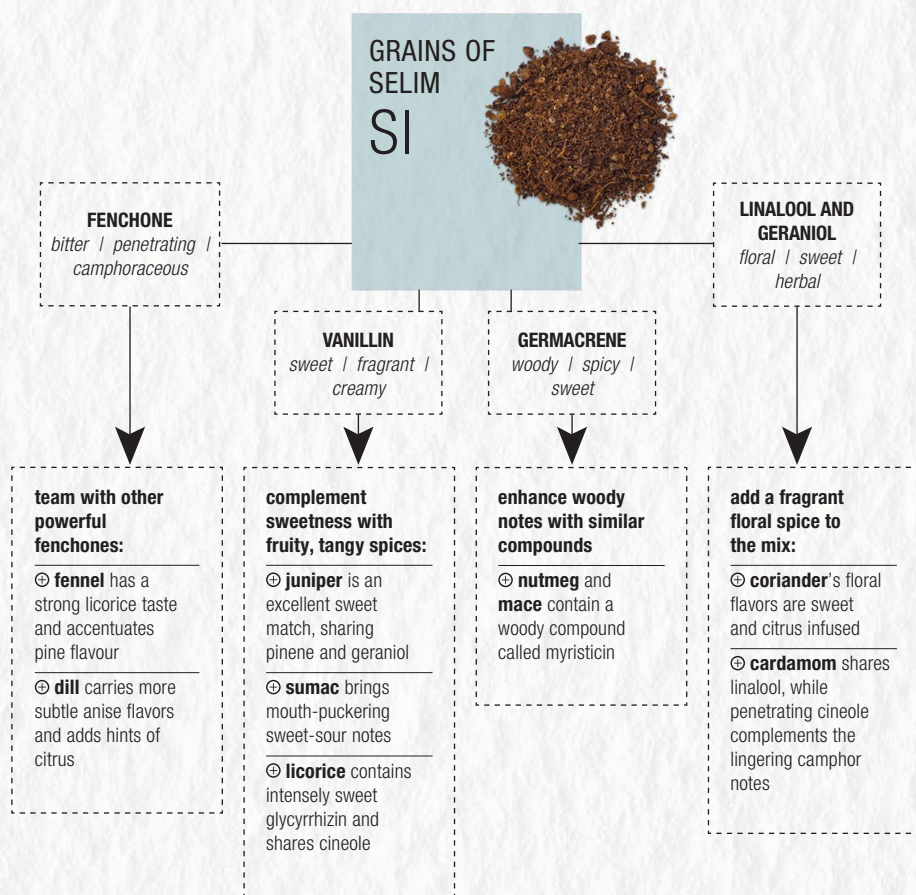


## Kitchen creativity

Whole pods add a raw pepperiness to soups, porridges, stews, and sauces, while the ground pods make excellent dry rubs for meat and fish. The whole pods are often tied in a muslin pouch so that they can be removed easily before serving.

### BLENDING SCIENCE

The unique flavor of grains of Selim is due to a powerful and unusual compound called fenchone. You can also make interesting matches with its less dominating flavor compounds, such as vanillin, germacrene, linalool, geraniol, and pinene.



### FOOD PARTNERS

- ⊕ **Drinks** Use the ground spice to make the Senegalese coffee drink *café touba*.
- ⊕ **Vegetables** Add the ground spice to a vegetable curry of beans, tomatoes, and zucchini; sprinkle the ground spice over a spiced squash soup.
- ⊕ **Fish** Use the ground spice as a rub for fish, such as cod, before grilling, baking, or adding to a richly spiced gumbo.
- ⊕ **Meat** Make peppersoup, a West African soup containing grains of Selim, nutmeg, chili, and assorted meats.
- ⊕ **Rice** Add a whole pod to pilaf or biryani, or to Nigerian "one-pot" jollof rice.

### MAXIMIZE THE SMOKINESS

Dried pods are smoked during drying to give a musky, wood-smoke aroma. Most of the smokiness is in the pods, so for the fullest smoky flavor grind the whole pods just before use.

*Aroma-laden fragments embed in the skin of the pods*



Pleasantly fragrant molecules (particularly phenolics) are deposited by the rising smoke particles as they wash over the dry fruit.

### RELEASE THE FLAVOR

The main flavor compounds of grains of Selim dissolve and mix well in fats and alcohol, but less so in water-based liquids.



**Cook briefly in fat** before adding to a dish, or add toward the end of the frying time.



**Add early when** cooking in watery dishes, to allow time for flavors to infuse the dish.

### BLEND TO TRY

Use and adapt this classic blend featuring grains of Selim.

*Yaji* p.36



# BLACK CARDAMOM

*Smoky | Camphorous | Resinous*

## BOTANICAL NAME

*Amomum subulatum*

## ALSO KNOWN AS

Winged cardamom, large cardamom, brown or greater cardamom, black gold

## MAJOR FLAVOR COMPOUND

Cineole

## PARTS USED

Seeds and whole fruit ("pod")

## METHOD OF CULTIVATION

Grown in forest shade; the seed pods of three-year-old plants are hand picked from near the base, before they fully ripen.

## COMMERCIAL PREPARATION

Pods are dried for 24–72 hours over an open fire in a curing kiln, which gives them their dark color and smoky taste.

## NON-CULINARY USES

In perfumes and dental products; in traditional medicine for treating sore throats, stomach disorders, and malaria.

### The plant

Growing in the damp shade of mountain forests, this frost-tender, herbaceous perennial has broad, leafy, evergreen shoots

Yellow-white flowers grow from rhizomes at ground level

Reddish pods contain up to 50 seeds, surrounded by sugary pulp



### Black cardamom

Buy whole black cardamom pods (not ground seeds) and store in an airtight container for up to 1 year. Seeds begin to lose their flavor as soon as they are removed from the pods, so use immediately.

### Chinese black cardamom

Also known as *cao guo*, these are the much larger pods of a different species of *Amomum*, but they have a very similar taste and can be used interchangeably.



## Spice story

Black cardamom has suffered from an unwarranted reputation as an inferior substitute for its green cousin, and until the 20th century was mainly used for perfumes in the West. The spice has traditionally been cultivated by the Lepcha community of Sikkim, a state in Northeast India. The Sikkimese themselves use black cardamom for medicinal purposes and rarely cook with it, but in China its culinary value has been appreciated for centuries. The spice has only been cultivated outside Sikkim since the 1960s, when it was introduced to Nepal and Bhutan, then later still to Darjeeling in West Bengal. Now both areas cultivate it for domestic use, notably as a key constituent of garam masala spice blends, and, increasingly, for export to the Middle East, Japan, and Russia.



### Region of cultivation

Native to the damp, hilly forest areas of the eastern Himalayas, from Nepal into China; up to 90 percent of black cardamom is still grown in the state of Sikkim in Northeast India.

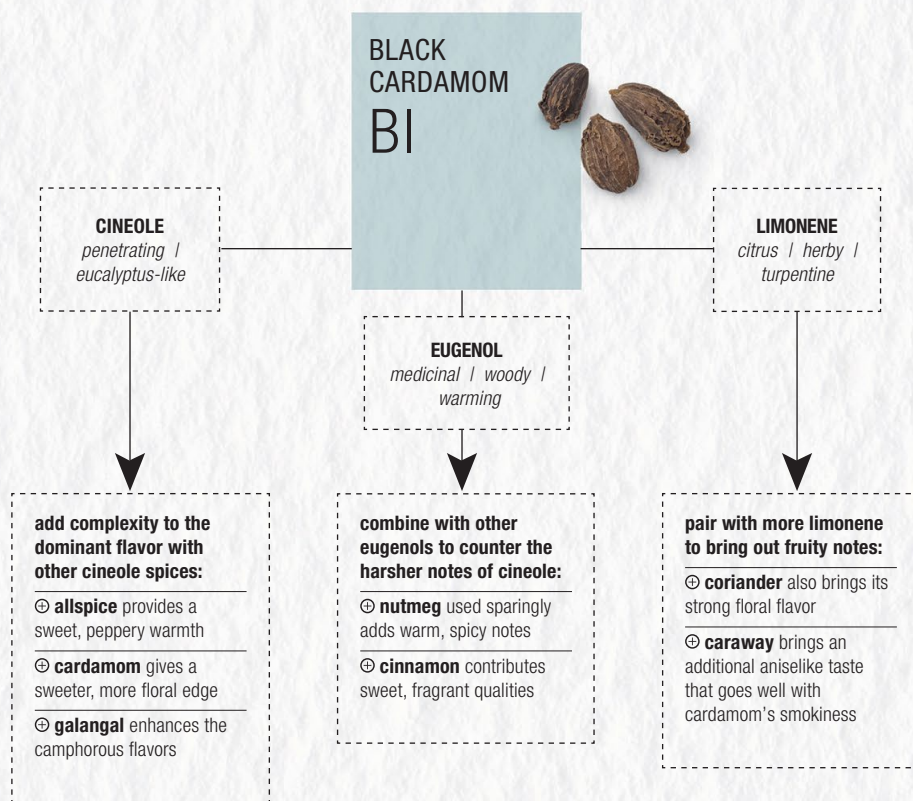


## Kitchen creativity

Black cardamom is best suited to slow-cooked, savory dishes. It is typically used in the braised meat dishes of Sichuan cuisine, in pho and other Vietnamese broths and soups, and in garam masala and pilafs of India and Nepal.

### BLENDING SCIENCE

Black cardamom is dominated by the same penetrating cineole compound that gives green cardamom its flavor, but here the similarity ends. Varied smoky phenols, significant amounts of clovelike eugenol, pinelike pinene, and citrusy limonene, offer a wide range of pairing opportunities.



### FOOD PARTNERS

⊕ **Bitter greens** Stir in a pinch of ground seeds when slow cooking bitter leafy vegetables, such as collard greens.

⊕ **Pickled vegetables** Whole pods work well in sweet or savory brines when pickling carrots, cucumbers, or tomatoes.

⊕ **Vegetarian stews** The char-grilled taste makes black cardamom a useful substitute for smoked bacon in stews and hot pots.

⊕ **Red meat** Add the bashed seeds to dry barbecue rubs for red meat.

⊕ **Chocolate** Sprinkle crushed seeds sparingly over dark chocolate mousse or over partially set chocolate when making chocolate bark or truffles.

### BLEND S TO TRY

Try these recipes for classic blends featuring black cardamom, or why not adapt them with some blending science?

**Garam masala** p.40

**Shandong spice bag** p.58

**Advieh** p.27

**Vindaloo paste** p.44

### RELEASE THE FLAVOR

Most of the smoky flavors are in the husk, so use whole pods if you want to retain the smokiness.



**Toast** whole pods or ground seeds to create nutty and roasted flavor compounds that interact with the smoky compounds.



**Lightly crush** whole pods before adding them early in cooking so that the full flavor can be infused into the dish.



**Grind the seeds** to release their flavorful oils for a more intense taste, but use immediately, as the oils quickly evaporate.



# CARDAMOM

*Eucalyptus* | *Citrusy* | *Floral*

## BOTANICAL NAME

*Elettaria cardamomum*

## ALSO KNOWN AS

Small cardamom, green cardamom, true cardamom, queen of spices

## MAJOR FLAVOR COMPOUND

Cineole

## PARTS USED

Whole “pods” (fruits) containing seeds

## METHOD OF CULTIVATION

Almost ripe seed pods are harvested by hand five or six times a year.

## COMMERCIAL PREPARATION

Seed pods are washed and then dried in the sun or in heated “curing” rooms.

## NON-CULINARY USES

Perfumery; cosmetics; in some cough drops; in Ayurvedic medicine to treat depression, skin conditions, urinary conditions, and jaundice.

### The plant

Cardamom is a tropical perennial in the ginger family. Its tall shoots develop from rhizomes (underground stems).

**Sword-shaped leaves** are very mildly aromatic.

**Fruits contain 15–20 seeds** that ripen from white to reddish-brown or black

**Flowers are green with a violet-streaked white petal**



### Seeds

The seeds in good-quality cardamom pods should be black and slightly sticky. Avoid using seeds that are dry and pale.

### Whole pods

The papery pods are normally yellowish green; white pods are bleached for aesthetic reasons, and have a weakened aroma.

**Pods are graded by width, with the fattest ones containing the most seeds**



## Spice story

Cardamom has been used for culinary and medicinal purposes in India for more than 2,000 years. The spice was known by the ancient Greeks and Romans, who valued its qualities as a perfume and digestive aid. Vikings from northern Europe are reported to have encountered the spice during their raids on Constantinople in the 9th century CE, and to have taken it back to Scandinavia, where it remains a popular flavoring for breads and pastries. Cardamom began to be grown as a secondary crop in the coffee plantations of British India in the 19th century, and in 1914 the spice was introduced to Guatemala, which is now the world's largest producer. Around 60 percent of all cardamom is consumed in Arab countries, where it is a key ingredient of *gahwa*, a fragrant coffee served as a symbol of hospitality.



### Region of cultivation

Cardamom is native to southern India and Sri Lanka, but Guatemala is now the world's largest producer, followed by India, Papua New Guinea, Sri Lanka, and Tanzania.

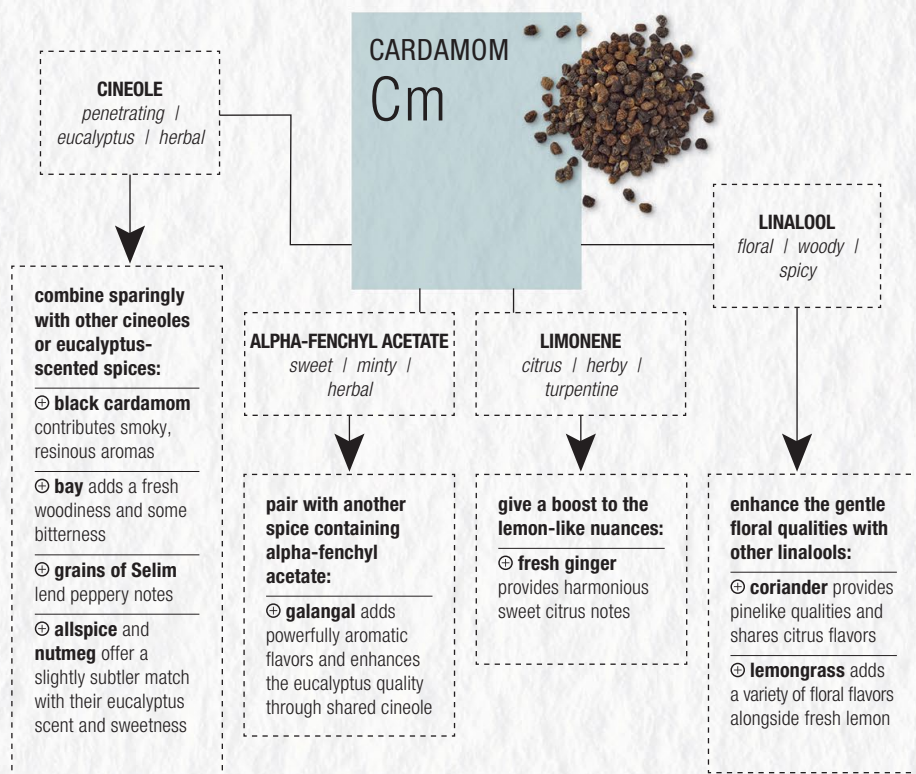


## Kitchen creativity

This highly aromatic spice is sweet, somewhat minty, and penetrating, making it suitable for both sweet and savory dishes, and more versatile than black cardamom, which lacks sweetness and has a smoky aroma that may not work in desserts.

### BLENDING SCIENCE

Cardamom's flavor profile is dominated by a powerfully penetrating eucalyptus-like flavor compound called cineole. It also contains a less common flavor compound, alpha-fenchyl acetate, which is sweet, minty, and herbal. In addition, there are significant amounts of several pleasant terpene compounds, including lemony limonene and delicately floral linalool.



### FOOD PARTNERS

- ⊕ **Apples** Add a small pinch of freshly ground cardamom to oven-baked apples.
- ⊕ **Rice** Sauté a couple of bruised pods lightly in oil, ghee, or butter before adding rice for a pilaf or biryani.
- ⊕ **Meat** Add a bruised pod to a creamy korma chicken curry or a lamb hot pot, to assuage the richness.
- ⊕ **Drinks** Steep a couple of bruised pods in black tea, coffee, liqueurs, or mulled wine.
- ⊕ **Baking** Sprinkle a pinch of freshly ground cardamom into a gingerbread mixture before baking.

### BLENDS TO TRY

Use and adapt these recipes for classic blends featuring cardamom:

- Turkish baharat** p.23
- Advieh** p.27
- Hawaij** p.29
- Durban curry masala** p.37
- Vindaloo paste** p.44
- Shandong spice bag** p.58
- Finnish gingerbread spice** p.72

### RELEASE THE FLAVOR

Whole pods give a subtle flavor and are suited to slow cooking, but always crush them before use. For a fresher, more intense flavor, and for quick-cooking dishes, remove the seeds and grind them.



**Toast pods or seeds** to add a bouquet of smoky, nutty, and roasted flavor compounds not previously present.

*Crushing also helps cooking oils and liquid to reach the seeds*



**Lightly crush pods** to open the husk and bruise the seeds, allowing flavorful oils to seep out from their storage cells.



**Cook with fat** in the dish, as most of the flavor compounds are almost insoluble in water.



# BAY

*Resinous | Herbal | Floral*

**BOTANICAL NAME**

*Laurus nobilis*

**ALSO KNOWN AS**

Sweet bay, bay laurel

**MAJOR FLAVOR COMPOUND**

Cineole

**PARTS USED**

Leaves, and less commonly the berries

**METHOD OF CULTIVATION**

Leaves can be harvested at any time of year. Two- to three-year-old leafy shoots are cut off the main plant by hand.

**COMMERCIAL PREPARATION**

Shoots are dried in the shade. Leaves are then collected, graded, and packaged.

**NON-CULINARY USES**

Perfumery and cosmetics; in traditional medicine as a cough medicine and antiseptic, and to treat skin and joint problems.

**The plant**

Bay is a fairly hardy evergreen shrub in the laurel family. It grows up to 23 ft (7.5 m) tall.

Clusters of yellow-white flowers develop in warm regions

Shiny, deep green leaves are aromatic, particularly when crushed or bruised


**Fresh**

Fresh leaves are quite edible, but can be leathery, and have a slight bitterness that gradually dissipates.

**Dried**

Good-quality leaves remain pale green in color. They have less bitterness and little aroma, but the fragrance is released upon cooking.



## Spice story

The ancient Greeks and Romans both regarded bay as symbolic of victory and high status. The Romans used bay leaves to flavor roasted meats, and added ground bay berries to stews and sauces. They also used bay leaves medicinally, and believed that garlands of the leaves would dispel evil spirits. The bay laurel was introduced from Asia Minor to all parts of the Mediterranean region in ancient times. By the Middle Ages it had reached right across Europe and continued to be ascribed spiritual significance. In the 17th century, the English herbalist Nicholas Culpeper wrote that a bay tree would provide protection from harm, and branches of the plant were burned in public spaces in times of plague.


**Region of cultivation**

Bay is native to the eastern Mediterranean region (Asia Minor). It is cultivated mainly in Turkey, which supplies more than 90 percent of the world market, but also across Europe, North Africa, Mexico, Central America, and southern US.

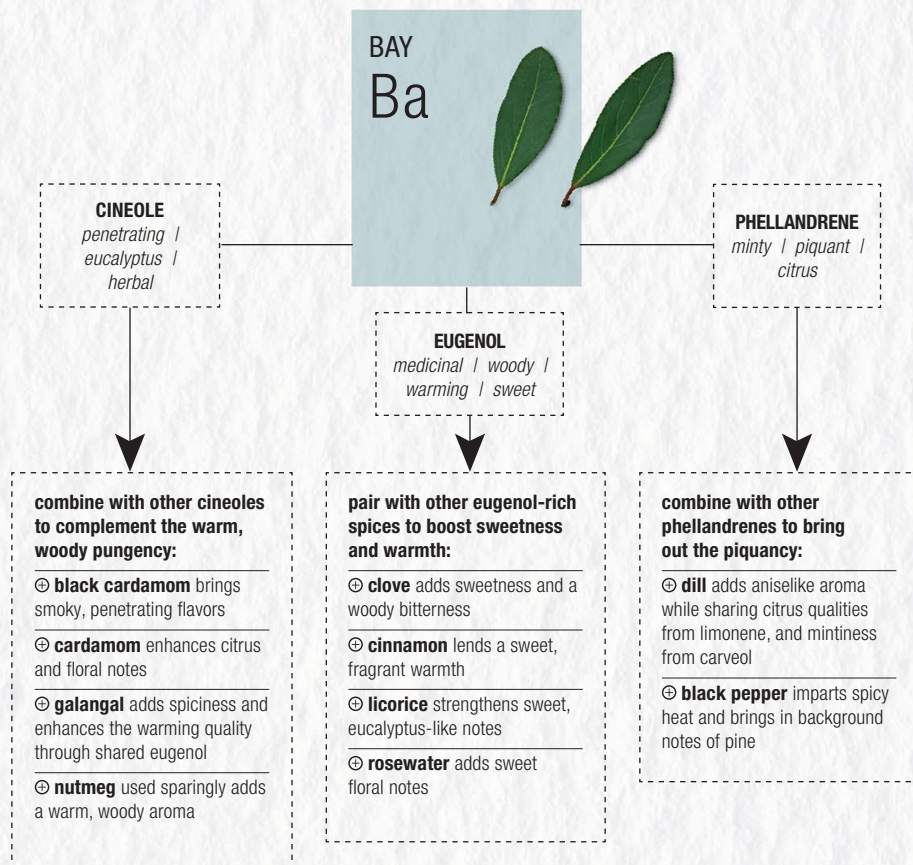


## Kitchen creativity

Added at the beginning of cooking, fresh or dried bay leaves yield their fragrant, warm flavors gradually. Traditionally, bay is an indispensable part of a bouquet garni, tied in a bundle with thyme and parsley, and removed before serving.

### BLENDING SCIENCE

The flavor profile of bay leaf is dominated by a terpene compound called cineole, which has an unusually penetrating, powerful eucalyptus scent. The next most abundant flavor compound is a spicy, sweet, warming phenol called eugenol. There are also small amounts of peppermint-like and slightly citrusy phellandrene, pinelike pinene and terpineol, and floral geraniol and linalool.



### FOOD PARTNERS

- ⊕ **Vegetables** Thread whole, oiled leaves onto vegetable skewers for barbecuing or grilling.
- ⊕ **Apples** Add a whole bay leaf to the filling for an apple pie.
- ⊕ **Grilled meat** Throw fresh or dried bay leaves onto barbecue embers before grilling meat.
- ⊕ **Seafood** Stuff a few bay leaves into the cavity of a whole fish before baking, or add to steamed mussels and clams.
- ⊕ **Cannellini beans** Cook soaked cannellini beans in water with bay leaves for a ribollita or bean purée.
- ⊕ **Chocolate** Infuse cream with bay and combine with melted chocolate for an aromatic ganache.

### BLENDERS TO TRY

Try these recipes for classic blends featuring bay, or why not adapt them with some blending science?

**Burmese garam masala** p.48

**Nanjing spice bag** p.59

**Mulling spice** p.73

**Khmeli-suneli** p.77

### RELEASE THE FLAVOR

Bay's flavor oils are deep within the leaf, which explains why dried leaves are still effective. Flavor compounds dissolve well in oil, fat, and alcohol, but poorly in water.



**Use in water-based cooking liquids** for a delicate flavor, and allow time for flavor compounds to spread into the dish.

*1 small bay leaf to 3 tbsp oil is a good ratio for most dishes*



**Extract maximum flavor** by adding to oil and heating gently before mixing with other ingredients.



# GALANGAL

*Warming | Pungent | Peppery*

## BOTANICAL NAME

*Alpinia galanga*

## ALSO KNOWN AS

Greater galangal, Laos root, Thai ginger, Siamese ginger

## MAJOR FLAVOR COMPOUND

Cineole

## PARTS USED

Rhizomes (underground stems)

## METHOD OF CULTIVATION

Grown as an annual crop, rhizomes develop clumps of green stalks and are harvested 3–4 months after planting.

## COMMERCIAL PREPARATION

Rhizomes are washed, then cut up and scraped to be sold fresh, dried, or ground.

## NON-CULINARY USES

Essential oil in perfumery; in traditional Ayurvedic medicine to boost appetite and treat heart and lung diseases.

### The plant

Galangal is a tropical herbaceous perennial in the ginger family, growing to 8 ft (2.5 m) tall in large clumps.

Flowers and buds are edible

Leaves are long and blade-shaped

Rhizomes resemble those of ginger, but are darker

### Dried

Galangal can be dried and either sliced or ground into a powder.

Dried slices are best softened in water before use

Rhizomes look yellow-orange after scraping

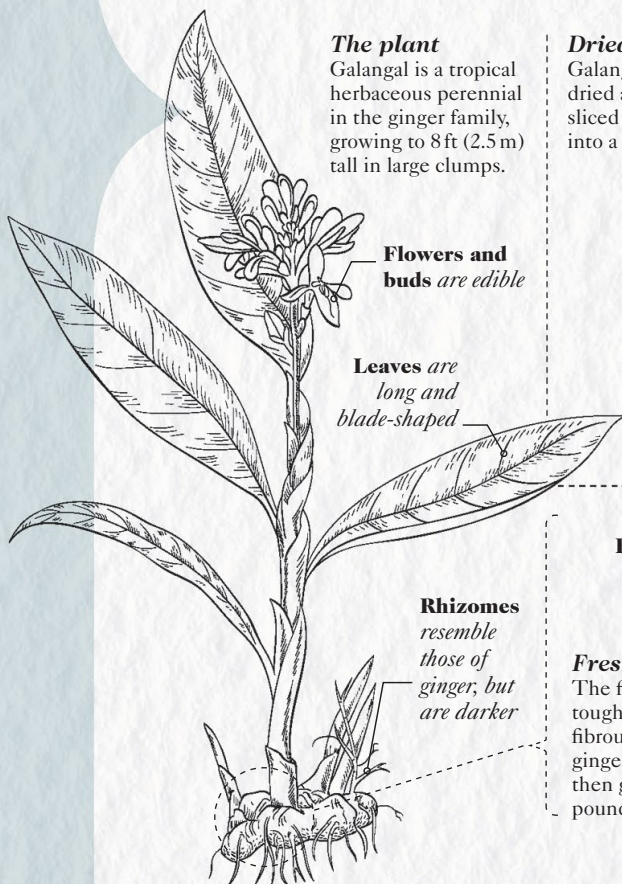
### Fresh

The flesh is tougher and more fibrous than that of ginger. Peel it, and then grate, slice, or pound to a paste.



### Region of cultivation

Galangal is native to Java, in Indonesia, but is now cultivated throughout Southeast Asia, India, Bangladesh, China, and Suriname.



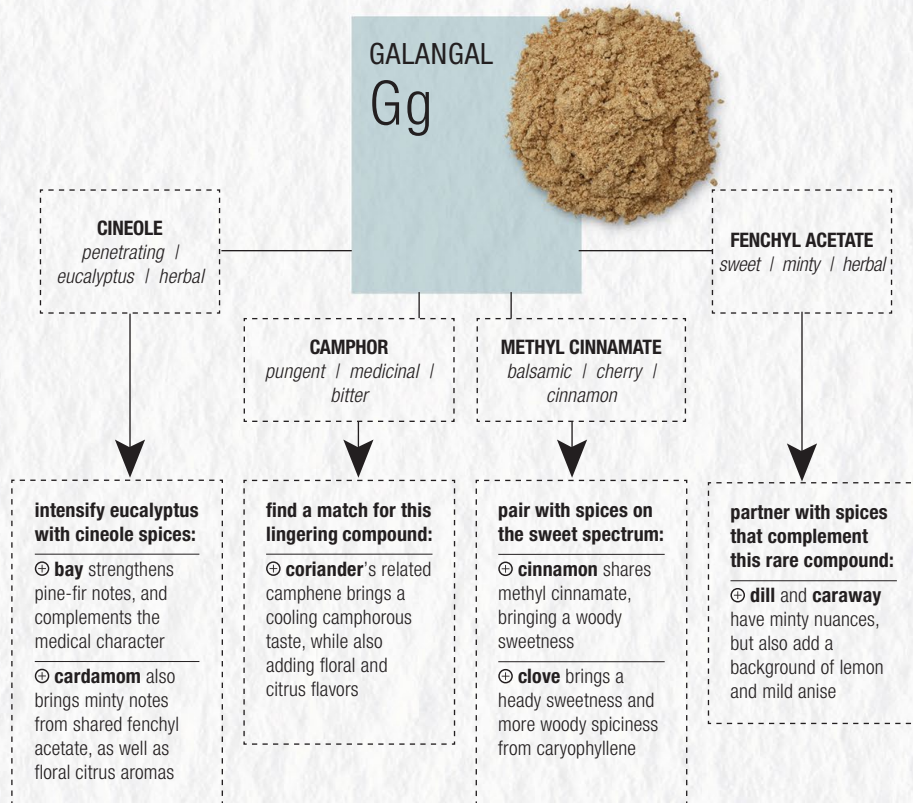


## Kitchen creativity

Galangal's flavor is an intriguing mix of cardamom, ginger, and saffron, with mustard and citrus notes. It has a reputation for heightening other flavors while retaining its own distinctive character.

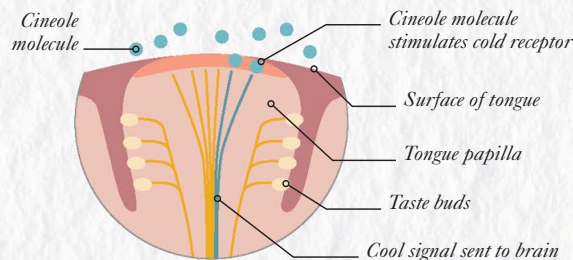
### BLENDING SCIENCE

Galangal's trademark lingering pungency comes from penetrating cineole and medicinal camphor, and unusual galangal acetate is responsible for its wasabi-like tang. Similarly uncommon methyl cinnamate and fenchyl acetate are often found in fruits, lending subtle notes of balsamic vinegar and fir tree, respectively.



### Cineole's cooling effect

Galangal's peculiar mouth-numbing coolness comes from cineole. This flavor compound has a molecular shape that directly stimulates a cold thermoreceptor, called TRPM8, which normally senses cold temperatures.

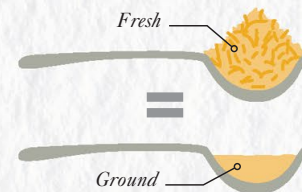


### FOOD PARTNERS

- ⊕ **Meat** Add galangal paste to your base for a beef rendang, slow-cooked beef ribs, or chicken marinade. Simmer slices in beef or chicken stock to form a base for *pho*, the Vietnamese noodle soup.
- ⊕ **Smoothies** Swap ginger for a smaller amount of galangal in your favorite fruit or vegetable smoothie.
- ⊕ **Fish and shellfish** Combine galangal and lemongrass with shallots, garlic, chili, and fish sauce to make a paste for Thai fish curry.
- ⊕ **Fruit** Grated galangal with lime juice, fish sauce, sugar, chili, and garlic makes a zingy dressing for green papaya or other fruit salads.

### RELEASE THE FLAVOR

Fresh galangal is best grated or pounded to a paste; slices release flavor more slowly. Oils are essential for fullness of flavor. Powder is harsher and less complex than fresh spice because subtler flavor compounds evaporate with processing.



If substituting ground galangal, use half as much as fresh.

### BLENDS TO TRY

Use and adapt these classic blends featuring galangal:

**Khao kua** p.49

**Bumbu** p.52



# ASIAN LARB SALAD WITH CURRIED DUCK AND KHAO KUA

Popular in both Laos and Thailand, larb is a fiery salad most often made with finely minced meat or fish, which is flavored with fresh spices and herbs and topped with roasted rice powder. This version mixes things up by adding in garam masala—the warm, aromatic spice mix at the heart of much Indian cooking.

## SPICE IDEAS

**Reinvent the citrus sour** in *khao kua* by replacing or enhancing lemongrass and lime leaves with lemon myrtle, sumac, or dried lime powder.

Instead of lime juice, **use tamarind water** in the dressing for a more lusciously fruity sweet-sour flavor.

**Personalize the garam masala:** create a more floral character with coriander and green cardamom; add fennel, dill, or caraway for underlying aniseed.

*Serves 2–3*

*Prep time 10 mins*

*Cooking time 2–3½ mins*

1 tbsp vegetable oil  
2 tsp garam masala (see recipe p.40)  
1 tsp Thai chili flakes, or any crushed dried chilis  
2 duck fillets, skin removed, then minced  
juice of 2 limes  
2 tbsp Thai fish sauce (*nam pla*)  
1 tbsp palm sugar or muscovado sugar  
2 lemongrass stalks  
4 shallots, finely sliced  
handful fresh mint leaves, chopped  
handful fresh cilantro leaves, chopped  
1 tbsp *khao kua* roasted rice powder (see recipe p.49)

- 1 Heat the oil in a frying pan over a medium heat. Add the garam masala and chili flakes and stir-fry for 1–2 minutes, until fragrant.
- 2 Turn the heat to high and add the duck mince. Fry for 1–2 minutes, until the meat is browned on the outside but still pink in the middle. Transfer to a plate and set aside.
- 3 To make the dressing, mix the lime juice and fish sauce with the sugar in a large bowl. Stir until the sugar has dissolved.
- 4 Prepare the lemongrass stalks by trimming the tops and bases and peeling off the woody outer layers. Crush the pale green, tender inner stalks using the back of a heavy knife, to release the aromatic oils. Chop the stalks finely.
- 5 Add the warm duck, shallots, chopped lemongrass, mint, and cilantro to the bowl of dressing. Stir until all the ingredients are well combined.
- 6 Sprinkle the *khao kua* over the salad and serve immediately. If you are preparing the salad ahead of time, only add the rice powder when you are ready to serve, so that it stays crunchy.







# DRIED LIME

*Tangy | Sour | Musky*

## BOTANICAL NAMES

*Citrus x latifolia* or *C. aurantifolia*

## ALSO KNOWN AS

Persian lime, noomi (*C. x latifolia*); Omani lime, loomi (*C. aurantifolia*)

## MAJOR FLAVOR COMPOUND

Citral

## PARTS USED

Dried fruits

## METHOD OF CULTIVATION

Trees are grown in orchards and the fruits picked when slightly under-ripe.

## COMMERCIAL PREPARATION

Fruits are boiled in brine and left to dry in the sun until they turn hard, darken, and begin to ferment.

## NON-CULINARY USES

Used by Arabian Bedouins as black fabric dye; in traditional medicine to stimulate digestion and reduce bloating.

### The plant

Limes grow on small, evergreen trees in the citrus family, native to tropical and sub-tropical regions.



Fruits are picked when mature, but still pale green

Leaves are aromatic and sometimes used in cooking

### Powder

Lime powder is made from grinding dried black limes and tastes similar to sumac.



▲ White lime

Black lime ►

Peel is leathery

### Whole

Black limes have had longer to ferment and develop stronger, musky flavors. The paler types are dried for a shorter time.

## Spice story

Limes are native to Southeast Asia and were brought to the Middle East by Arab traders, though exactly how and when is unclear, since lemons and limes were often referred to by the same name in Arabic texts. By the 10th century CE, Arab traders had introduced the fruits to Egypt and North Africa, and from there they spread across southern Europe during era of the Crusades. Limes first made it to the Americas in the 16th century, planted in the West Indies by European explorers. The practice of drying limes first developed in Oman. Some believe the idea suggested itself after unharvested fruits dried on the trees and began to ferment. Used in cooking throughout the Middle East, dried limes are most closely associated with Persian cuisine.



### Region of cultivation

The most important lime producers for the Middle Eastern market are Egypt, Turkey, and Israel. The preparation of dried limes is carried out in Oman, Saudi Arabia, Iraq, and Iran.

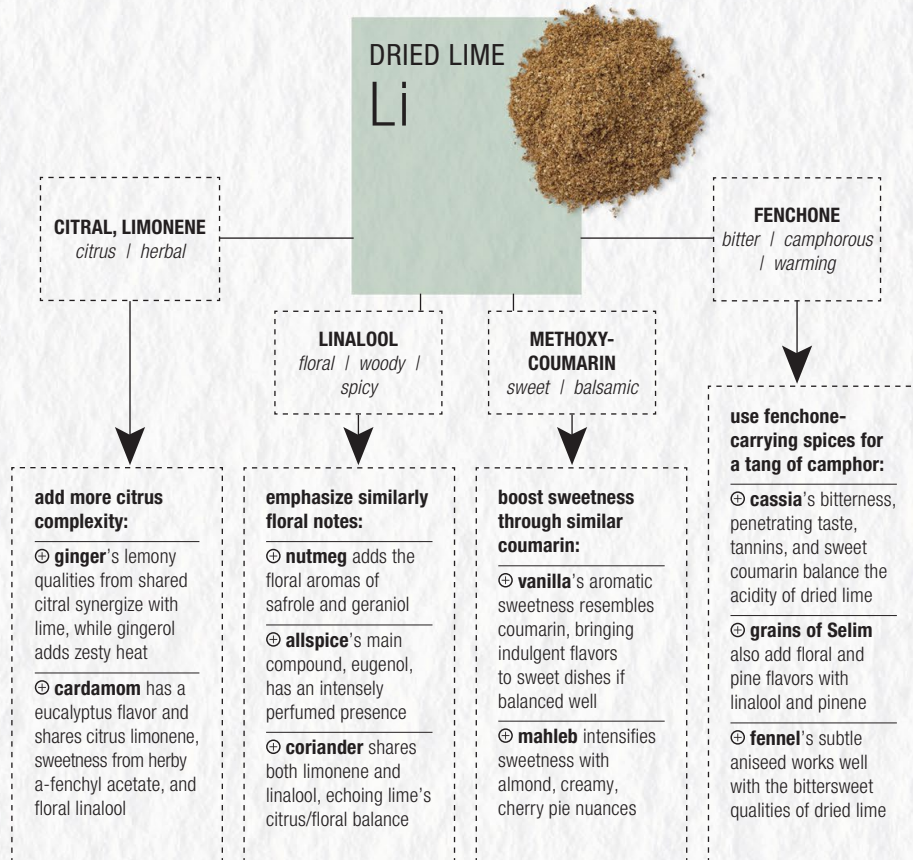


## Kitchen creativity

Limes are the most acidic of all citrus fruits, but they carry a fragrant, floral quality that is unique in the citrus family. The process of drying limes develops vinegary, earthy qualities, a hint of smoke, alongside mild fermented flavor.

### BLENDING SCIENCE

Some acids break down into sugar, meaning dried lime is less powerfully sour than fresh lime, allowing its other flavors to shine. Pair with spices that also highlight its subtle woody, camphorous, floral, and sweet notes.



### RELEASE THE FLAVOR

Unlike the eye-watering hit of fresh limes, the complex flavors of whole dried limes need coaxing out, although powder can offer an imperfect shortcut.



**Pierce whole limes** with a skewer before adding to a dish: the flesh gradually rehydrates to release flavors.



**Fats and alcohol** release fragrant terpenes in the peel. Methoxycoumarin, acids, and sugar dissolve in water, hence low-fat dishes are sweet and tart, but lacking in aroma.

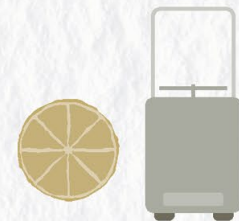


**Lime powder** is best for quick-cook dishes. If using in slower dishes, add later so the terpenes have less time to evaporate.

### FOOD PARTNERS

- ⊕ **Fruit salad** Swap lemon juice for ground dried lime in a syrup for a fruit salad.
- ⊕ **Vegetables** Add a whole dried lime to the base of an Iranian chickpea and vegetable stew, after softening onions, carrots, and garlic.
- ⊕ **Fish** Introduce powdered dried lime to a fish curry, or over grilled shellfish or sea bass.

- ⊕ **Chicken** Pierce a dried lime and place it in the cavity of a chicken before roasting, or add to the poaching broth for chicken, along with turmeric, saffron, and onion.
- ⊕ **Grains** Use ground dried lime to flavor rice dishes and pilafs, or sprinkle over a quinoa or bulgur wheat tabbouleh salad.



**Grind** in an electric grinder, first cutting in half and removing the seeds.



# LEMON MYRTLE

*Citrusy | Warm | Bitter*

## BOTANICAL NAME

*Backhousia citriodora*

## ALSO KNOWN AS

Sweet verbena tree, lemon ironwood

## MAJOR FLAVOR COMPOUND

Citral

## PARTS USED

Leaves (fresh or dried)

## METHOD OF CULTIVATION

Leaves are harvested all year round, by mechanical harvesters or by hand.

## COMMERCIAL PREPARATION

The leaves are separated from their stems and then dried using drying machines. They are packaged whole or ground.

## NON-CULINARY USES

Cosmetics and perfumery; in herbal medicine for its antibacterial and antioxidant properties; topical antiseptic.

### The plant

Lemon myrtle is an evergreen tree in the myrtle family, and is related to allspice and clove.

Flowers and berries are edible but not sold commercially

Leaves are thick, glossy, and strongly lemon scented

Good-quality powder has a green hue; avoid brown powder

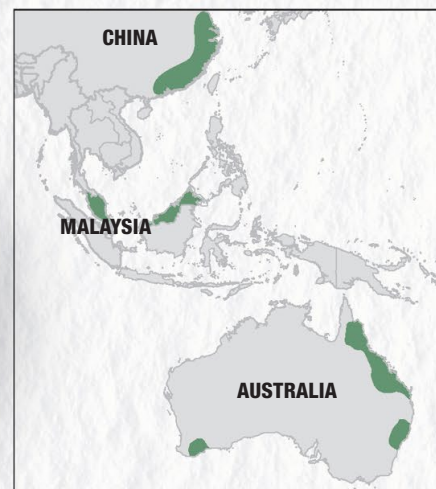


### Powder

Lemon myrtle is most readily available to buy as coarsely ground or crushed dried leaves. It degrades rapidly in sunlight and warmth, so must be stored in cool, dark conditions.

## Spice story

The potent aromatic foliage of the lemon myrtle tree has long been prized—possibly for millennia—by aboriginal Australians, who use them in cooking and to treat cuts. The leaves were first distilled for essential oil in 1888, and during World War II an extract from the lemony leaves was used as a substitute for commercial lemon essence, supplies of which had become scarce. However, it was not until the early 1990s that lemon myrtle, by then a potentially lucrative crop for the food and drink industry, began to be cultivated as a spice. Demand is now outstripping supply, and plantations have been established outside Australia. Since 2010, lemon myrtle has been under attack from myrtle rust, a fungal infection, which could threaten this species in the long term.



### Region of cultivation

Lemon myrtle is native to coastal subtropical rainforests of Queensland, Australia. It is grown in some subtropical areas of Australia (mainly in Queensland and northern New South Wales), Malaysia, and China.



# Kitchen creativity

Lemon myrtle has a bright citrus flavor—more lemony than lemon, but without the acidity of that fruit’s juice—with green, herbal notes and a subtle scent of eucalyptus. Add sparingly to both sweet and savory dishes.

## BLENDING SCIENCE

The leaf oil of lemon myrtle consists almost entirely of citral—a lemon-scented flavor compound that is up to 30 times more concentrated in this spice than in lemon rind. Alongside are small amounts of floral linalool, peppery myrcene, and the green-tasting ketone sulcatone.



## FOOD PARTNERS

- ⊕ **Garlic and oil** Infuse olive oil with garlic and lemon myrtle for use in salad dressings and marinades.
- ⊕ **Squash** Combine with cracked black pepper and sprinkle over roasted squash.
- ⊕ **Oily fish** Mix crushed lemon myrtle with sea salt and sprinkle over salmon or trout before grilling or barbecuing.
- ⊕ **Lamb** Adapt an Egyptian dukkah (see p.28) with lemon myrtle and macadamia nuts for seasoning roasted lamb.
- ⊕ **Baking** Drizzle lemon-myrtle-infused syrup over a quince, pear, or plum cake, or use the syrup in a sorbet. Boost the lemony taste of lemon meringue pie with a pinch of lemon myrtle in the filling.

## RELEASE THE FLAVOR

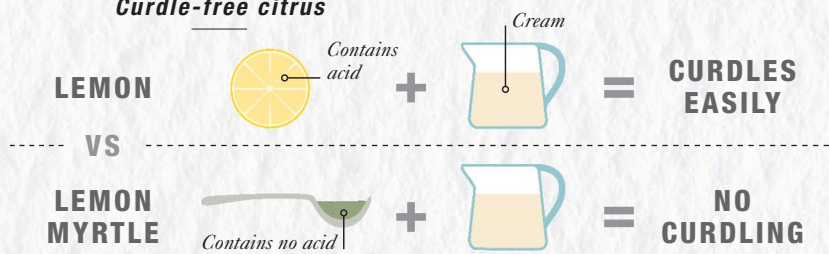
Citral is unstable and breaks down over time, allowing camphor and eucalyptus notes to dominate. The compound does not dissolve in water.



**Add toward the end of cooking** or use in recipes with only a short cooking time. Ensure fats are included in the dish.

## Curdle-free citrus

Acids present in the juice of lemons and other citrus fruits cause protein molecules in dairy products, such as milk and cream, to clump together, resulting in curdling. Lemon myrtle does not contain acids, so can be added to milk- or cream-based sauces and desserts to give them an intense lemon-lime flavor without any risk of curdling.





# LEMONGRASS

*Citrusy | Peppery | Refreshing*

## BOTANICAL NAME

*Cymbopogon citratus*

## ALSO KNOWN AS

Serai, oil grass,  
West Indian lemongrass

## MAJOR FLAVOR COMPOUND

Citral

## PARTS USED

Stalks, leaves

## METHOD OF CULTIVATION

Around three times a year, the whole clump of leaf bases and young stems are hand-cut at the base of the plant.

## COMMERCIAL PREPARATION

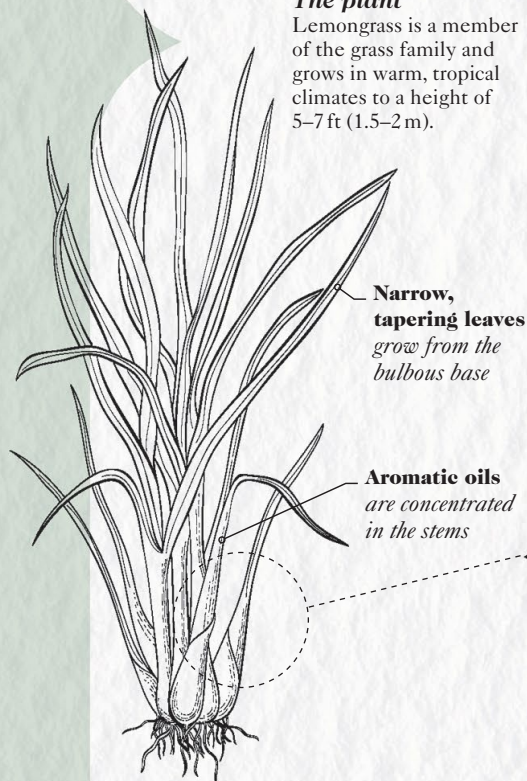
Stems are separated, cleaned, and trimmed to lengths of 8 in (20 cm), and then bundled for drying or using fresh.

## NON-CULINARY USES

In perfumes, soaps, and toiletries; in insect repellents; anti-inflammatory medication; as a fungicide; and to relieve joint pain.

## The plant

Lemongrass is a member of the grass family and grows in warm, tropical climates to a height of 5–7 ft (1.5–2 m).



Narrow, tapering leaves grow from the bulbous base

Aromatic oils are concentrated in the stems

## Powder

Dried, ground lemongrass (also called *serai*), imparts only a fraction of the spice's complex character.



One teaspoon is roughly equivalent to a stalk of lemongrass



The most tender inner part of the stem can be eaten raw

## Fresh

Store well wrapped in the refrigerator for up to 2 weeks. Leaf blades can also flavor dishes: tie in a knot and gently bruise.

## Spice story

The Latin name for lemongrass, *Cymbopogon*, derives from the Greek words *kymbe* (boat) and *pogon* (beard), referring to the shape of its flowers, now rarely present in cultivated varieties. The spice has been used both medicinally and as a flavoring agent in its native Asia for thousands of years. In 10th-century China it was used as an insect repellent, the fragrant leaves being placed on beds to ward off fleas. By the Middle Ages, lemongrass had made its way to Europe from Asia via caravan spice routes—the spice appears in several brewing and spiced wine recipes of the time. In the 19th century, India began cultivating lemongrass, mainly to export the aromatic oil for scenting soaps and cosmetics. However, it was Southeast Asian rather than Indian cuisine that adopted lemongrass as a staple spice.



## Region of cultivation

Lemongrass is cultivated throughout the tropics, in India, Sri Lanka, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia, Australia, the Americas, and West Africa.

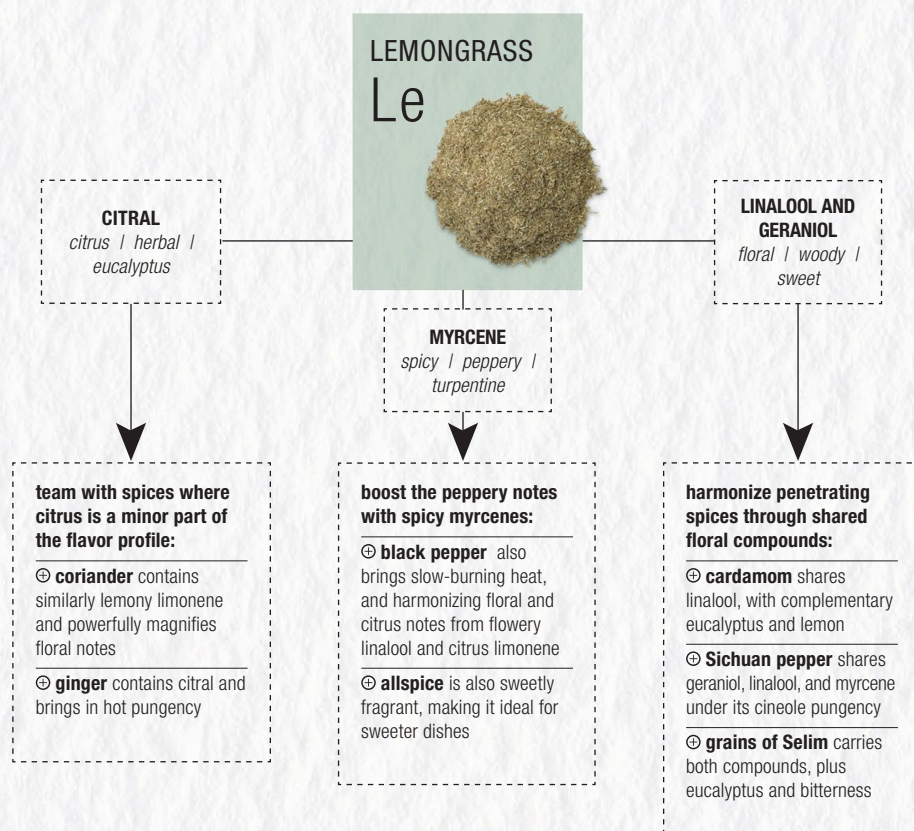


## Kitchen creativity

Delicate lemongrass enlivens curries, stir-fries, pickles, salads, and soups. Use the tender inner stalk in curry pastes, marinades, and spice rubs, or bruise the whole fibrous stalk and use in stocks or soups, removing it before serving.

### BLENDING SCIENCE

Lemon-scented citral makes up 70 percent of the spice's flavor compounds, but the key to spice pairing is to avoid intensifying this dominant citrus with another lemony spice. Instead, bring out lemongrass's mild pepperiness from myrcene, and/or its sweet and floral elements from linalool and geraniol.



### RELEASE THE FLAVOR

Most of lemongrass's flavor comes from oil glands deep inside the grass. The stems must be crushed to burst open the glands and release the oils.



**Slice, grate, or pound** for quicker cooking: the greater the damage, the faster the oils will leak out. Add powder late in cooking.



**Gently bruise or bend** leaf blades for lengthy cooking, to prevent too many of the flavor compounds evaporating.



**Cook with fats**, such as coconut milk, to ensure oil-based citrus and floral flavor compounds spread throughout the dish.

### FOOD PARTNERS

⊕ **Fish cakes** Make Thai fish cakes by adding lemongrass, chili, ginger, garlic, and lime leaves to fish and potatoes before frying.

⊕ **Pork** Marinate pork in a paste of finely chopped lemongrass, ginger, coconut, and turmeric before grilling or barbecuing.

⊕ **Granita** Infuse a sugar syrup with lemongrass and lime zest. Strain to make granitas or ice pops.

⊕ **Salad** Add finely chopped lemongrass to a dressing for a Thai noodle salad with slivers of carrot, chili, cucumber, and a handful of toasted nuts and herbs.

⊕ **Fruit** Instead of adding pared lemon peel to the poaching liquid for pears, rhubarb, quince, or peaches, add a bruised stick of lemongrass for a hint of pepperiness.

### BLEND TO TRY

Try this recipe for a classic blend featuring lemongrass, or why not adapt it with some blending science?

*Khao kua* p.49



# AMCHOOR

*Citrus* | *Herbaceous* | *Bittersweet*

## BOTANICAL NAME

*Mangifera indica*

## ALSO KNOWN AS

Mango powder, amchur

## MAIN FLAVOR COMPOUND

Ocimene

## PARTS USED

Flesh of unripe fruits

## METHOD OF CULTIVATION

Unripe mangoes are harvested mechanically or by hand.

## COMMERCIAL PREPARATION

Fruits are peeled, sliced, and oven- or sun-dried to remove 90 percent of their moisture, then packed as slices or ground.

## NON-CULINARY USES

In Ayurvedic medicine to treat respiratory diseases and digestive complaints.

### The plant

Mango is a large tropical evergreen tree in the cashew family.

Cream or pink flowers develop into fruits

Green, unripe fruits have sour, astringent flesh



### Powder

Amchoor powder has a coarse texture and is light beige in color. It can be stored for up to a year in a sealed container away from sunlight.



### Whole

Dried slices are light brown and resemble rough-textured wood. Store in a sealed container in a cool, dark place for up to 4 months, and grind as needed.

## Spice story

Mangoes have been cultivated in India for more than 4,000 years, and are strongly linked to the Ayurvedic system of traditional Indian medicine. According to Hindu folklore they also have sacred properties, and Ganesh, the Hindi elephant-headed god, is often shown holding a ripe mango as a symbol of attainment. Buddhist monks took mangoes to East Asia in the 4th and 5th centuries CE, and the fruit was subsequently transported west along trade routes, reaching Africa in around 1000 CE and northern Europe by the early 14th century. The fruit was introduced to Brazil by Portuguese explorers in the 17th century, and also reached Mexico via the Philippines. In the mid- to late 18th century, mangoes reached the West Indies, probably via Brazil.



### Region of cultivation

Mangoes are native to India and Myanmar, and over 40 percent of the total world crop is cultivated in India. Other major producers include Pakistan, Bangladesh, China, Thailand, Indonesia, the Philippines, and Mexico.

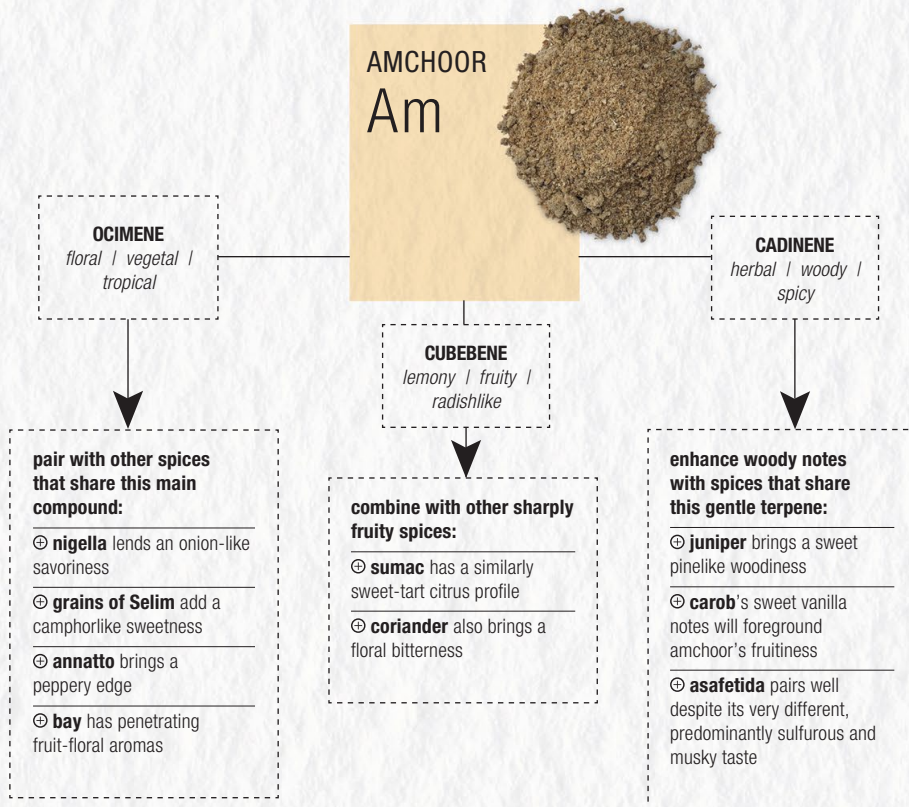


## Kitchen creativity

Amchoor has a fruity, very tart but slightly resinous taste, with a citrus tang. It is often used as a souring agent, much like lemon but with the benefit of not adding moisture. Use it judiciously, as the bittersweet flavor can be overpowering.

### BLENDING SCIENCE

As well as pairing with the following spices that share the same or similar fruity, herbal, and vegetable-like flavor compounds, take advantage of the sweet and puckering qualities of amchoor by pairing with galangal and ginger, or the sweetly aromatic nutmeg and cinnamon.



### Concentrated sweet-and-sour taste

Drying the mango evaporates most of its water, reducing its moisture content from over 80% to less than 10%. In the process, the acids, sugars, and flavor compounds become highly concentrated, resulting in a distinctly sweet-and-sour taste profile.



One teaspoon of amchoor powder has the acidity of three tablespoons of lemon juice.



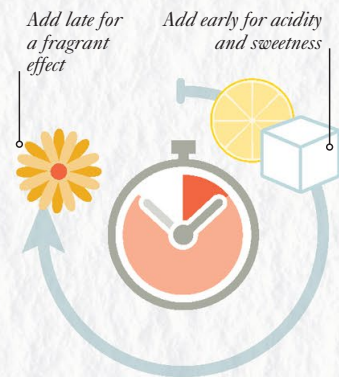
Fruit sugars are concentrated during drying to around 65%.

### FOOD PARTNERS

- ⊕ **Fish and prawns** Add to a crumb or batter coating for fried fish or prawns.
- ⊕ **Lamb** Use amchoor to make a marinade for lamb chops, shoulder, or shanks. Rub it over the meat and leave it overnight before grilling or slow roasting; the acidity works as a tenderizer.
- ⊕ **Lentils** Stir into a soothing dhal to add a touch of piquancy.
- ⊕ **Vegetables** Sprinkle over roasted cauliflower, or add a pinch to stir-fried eggplant or okra.
- ⊕ **Tropical fruit** Add a pinch to a sweet tropical fruit sorbet or salad.

### RELEASE THE FLAVOR

Many of amchoor's terpene flavors quickly evaporate, but the fruit sugars do not. Citric acid also boils less easily than water, which means its sweet-tart effect will increase with prolonged cooking.



### BLENDS TO TRY

Use and adapt this recipe for a classic blend featuring amchoor:

*Chaat masala* p.42



# ANARDANA

*Sweet | Sour | Fruity*

## BOTANICAL NAME

*Punica granatum*

## ALSO KNOWN AS

Pomegranate

## MAJOR FLAVOR COMPOUNDS

Citric acid and malic acid

## PARTS USED

Fruitlets (incorrectly called seeds)

## METHOD OF CULTIVATION

The fruit is cut off the tree when fully ripe, but before it splits open.

## COMMERCIAL PREPARATION

The seeds and pulp are separated from the bitter white membrane and dried in the sun.

## NON-CULINARY USES

The seeds and rind are widely used in Indian, traditional European, and Middle Eastern medicine to reduce fever, aid digestion, and as an anti-inflammatory.

### The plant

Anardana comes from the fruits of a large flowering shrub in the loosestrife family. It is deciduous in temperate climates but evergreen in some tropical regions.

Hibiscus-like flowers can be bright orange-red or white



Round fruits are technically berries

Leathery skin protects rubylike fruitlets separated by white pith



Slow-dried fruitlets are reddish-brown to black in color

### Dried fruitlets

Consisting of seeds surrounded by the fleshy aril (pulp), these are slightly soft, sticky, and semi-moist.



### Powder

Dried fruitlets are also available ground into powdered form.

## Spice story

The pomegranate has been grown for at least 5,000 years, making it one of the oldest cultivated fruits, probably originating in and around Persia (now Iran). By the early Bronze Age, cultivation had spread throughout the southern Mediterranean and eastward to India and China. Its abundant seeds made the pomegranate an enduring symbol of fertility in many ancient cultures, notably Egypt, where pomegranate motifs can be found in temples and tombs. In the Greco-Roman period, physicians prescribed it to treat tapeworm, and the Roman recipe book *Apicius* contains a recipe for a digestive pomegranate drink supposedly enjoyed by Emperor Nero. The culinary home of the dried spice in particular remains, as it has for millennia, in Indian and Persian cuisine.



### Region of cultivation

Pomegranate is native to and mainly cultivated in the Middle East, Turkey, the Caucasus, and India, and also in Southeast Asia and in China.

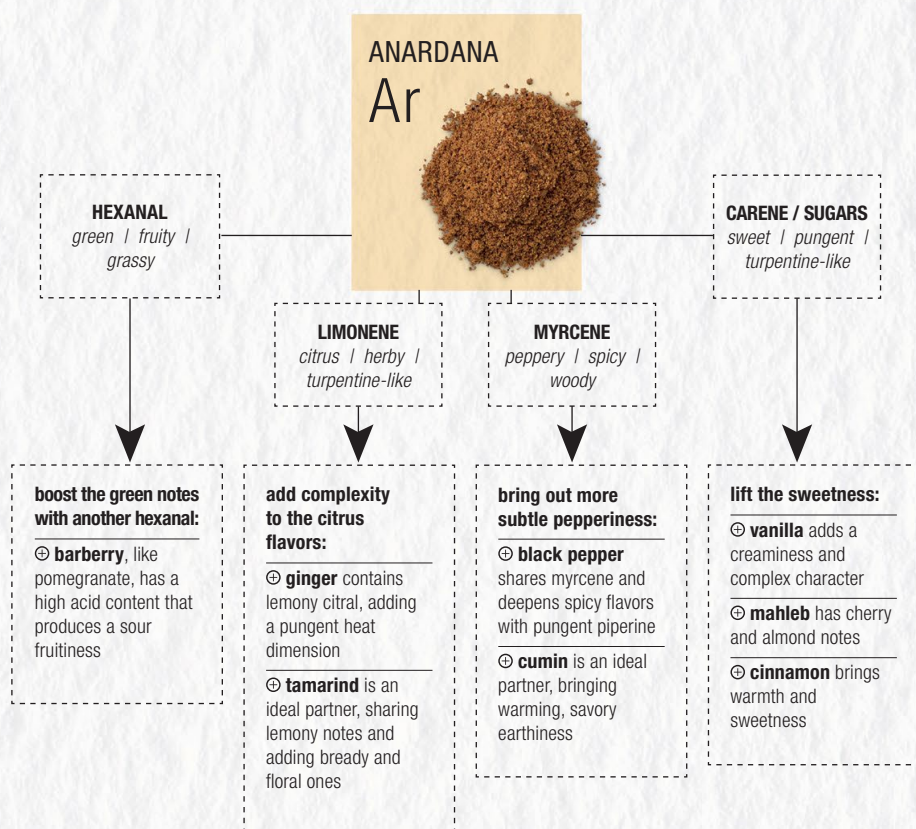


## Kitchen creativity

Anardana is popular in northern India, where it is used as a souring agent in curries, pakoras, and chutneys. Many Iranian dishes—such as *fesenjan*, a chicken and walnut stew—combine the spice with pomegranate molasses for a richer flavor.

### BLENDING SCIENCE

Pomegranate's tangy fruitiness primarily comes from its mix of acids, sugars, and tannins. The compounds giving its appetizing aromas range from "green" hexanal and citrusy limonene to peppery myrcene and sweet, turpentine-like carene. These compounds are pivotal when looking for suitable spice partners.



### Sweet and sour

The decidedly tart yet fruity flavor profile of anardana is due to a relatively high acid content balancing out the fruit sugars, while large amounts of tannins provide a mouth-drying finish.

**Exact proportions** vary depending on the region of cultivation; seeds from North India are known for their sourness.



### FOOD PARTNERS

- ⊕ **Tropical fruit** Sprinkle ground anardana over a mango and lime salad.
- ⊕ **Vegetables** Add dried seeds to braised vegetables; sprinkle whole or ground over curried carrot or parsnip soup, or potato and cauliflower curry.
- ⊕ **Meatballs** Make *ash-e anar*, an Iranian soup containing meatballs, pomegranate (fresh and dried), yellow split peas, rice, and herbs.
- ⊕ **Chicken** Add dried seeds to a spiced yogurt marinade for chicken before grilling or barbecuing.
- ⊕ **Rice, chickpeas** Pair with dried fruits in a fragrant pilaf, or scatter over fried cooked chickpeas along with cumin and salt.
- ⊕ **Sweet baked goods** Stir dried seeds into a mix for granola bars or cookie dough.

### RELEASE THE FLAVOR

Anardana's main flavor profile comes from sugars, acids, and tannins, all of which dissolve in water.



**Add directly** to a watery sauce (no need for oil) to infuse a dish with the spice's pleasant tang.



**Pound** dried seeds for a more intense flavor, but use a pestle and mortar as the seeds will stick to a grinder.



# SUMAC

*Sour | Fruity | Woody*

**BOTANICAL NAME**

*Rhus coriaria*

**ALSO KNOWN AS**

Elm-leaved sumac

**MAJOR FLAVOR COMPOUND**

Malic acid

**PARTS USED**

Dried berries (in fact drupes, not true berries)

**METHOD OF CULTIVATION**

In late summer, just before the fruits fully ripen, the branches are dried in the sun. The berries are then rubbed off.

**COMMERCIAL PREPARATION**

Berries are cleaned and may be brined for several days before grinding. Further drying may be needed after grinding.

**NON-CULINARY USES**

Fabric dye; leather tanning; in traditional Middle Eastern medicine to treat fever.

**The plant**

Sumac is a deciduous shrub in the cashew family. It grows in uplands and on rocky mountains in temperate and subtropical regions.

**Green leaves**  
turn red in  
autumn

**Rust-colored berries** are  
borne in  
conical clusters

**Coarse powder**  
is brick-red and  
slightly moist


**Powder**

Sumac is not highly scented, so lack of aroma need not be a sign of poor quality. Salt might be mixed in to prevent clumping; avoid buying sumac with this additive. Whole dried berries may also be available.

## Spice story

The name “sumac” is derived from the Aramaic word *summaq*, meaning “red.” Long before lemons reached Europe, the Romans imported sumac from Syria to use as a souring agent, and also as a dye. The Roman naturalist Pliny the Elder celebrated its astringent and cooling properties. Sumac has been used in Middle Eastern cooking since at least the 13th century CE in the *za’atar* spice blend, alongside sesame seeds and dried herbs. The spice is mainly used in Lebanese, Syrian, Turkish, and Iranian cuisine. Until the 1980s, sumac was almost impossible to obtain outside of the Middle East. However, a number of food writers have championed Middle Eastern cuisine in the last couple of decades, and as a result this spice is now experiencing a renaissance among cooks in the West.


**Region of cultivation**

Sumac grows wild and is cultivated across the Mediterranean and the Middle East, particularly in Sicily, Turkey, and Iran, and in some parts of Central Asia.

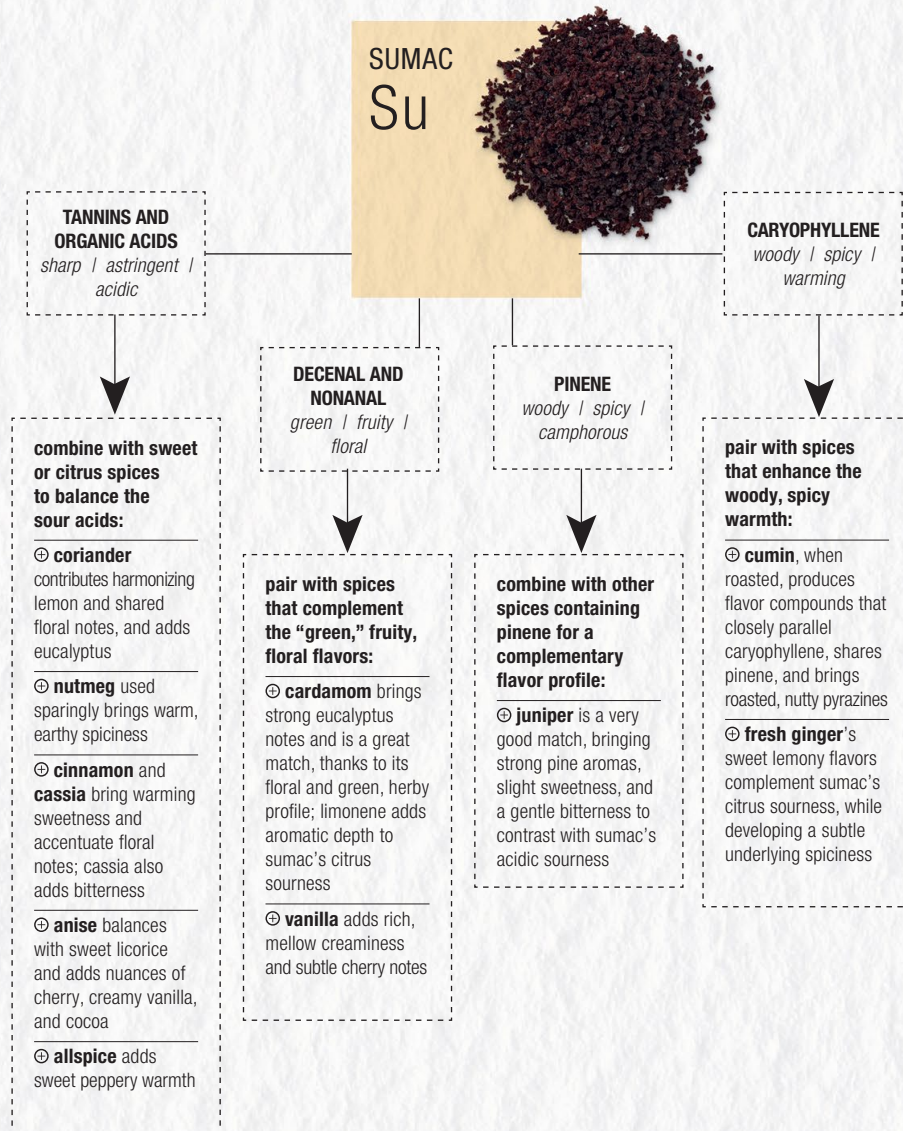


## Kitchen creativity

Sumac has a sharp, acidic taste, reminiscent of lemon balm, and a spicy, earthy, woody aroma. It can be used in any dish that calls for lemon zest or lemon juice, or as a seasoning added like salt.

### BLENDING SCIENCE

Sumac owes its sharp, mouth-puckering tartness to high levels of organic acids (mainly citric, tartaric, and malic acids) and astringent tannins. Fragrance comes from the terpenes caryophyllene, which has a musty, woody aroma, and pinene, which carries a fresh, pinelike aroma. "Green" aldehydes, such as earthy decenal and fruity, floral nonanal, complement the freshness.



### FOOD PARTNERS

- ⊕ **Root vegetables** Sprinkle ground sumac over roasted root vegetables.
- ⊕ **Tomatoes** Garnish sliced ripe tomatoes with sumac and a drizzle of pomegranate molasses.
- ⊕ **Chickpeas** Sprinkle over hummus or fried chickpeas, or use in falafel.
- ⊕ **Meat** Use sumac to garnish grilled or roast chicken or quail, with oil as a marinade for meat, or in lamb kofte.
- ⊕ **Fish** Sprinkle sumac over Lebanese-style spicy baked fish.
- ⊕ **Yogurt and cheeses** Scatter sumac over a whipped feta and tahini dip, baked feta, or fresh labneh with herbs, or over grilled halloumi.

### RELEASE THE FLAVOR

Much like salt, sumac enhances the flavors of foods to which it is added. Use powder to experience the full intensity of sumac's dry tartness and aroma.



**The strained juice** has a milder flavor that works well in jellies and sweet, summery drinks.



**Sprinkle sumac** as a garnish over a finished dish for maximum impact, rather than at the start of cooking.

### BLEND TO TRY

Use and adapt this recipe for a classic Syrian seasoning:

*Za'atar* p.22



# TAMARIND

*Sour | Fruity | Sweet*

**BOTANICAL NAME**

*Tamarindus indica*

**ALSO KNOWN AS**

Indian date

**MAJOR FLAVOUR COMPOUNDS**

Furfural, 2-phenyl acetaldehyde

**PARTS USED**

Pulp of ripe pods

**METHOD OF CULTIVATION**

Pods are harvested when fully ripe, and are either picked by hand, or fall to the ground when the tree is shaken.

**COMMERCIAL PREPARATION**

Pod shells are removed and the pulp is compressed into blocks of paste.

**NON-CULINARY USES**

In traditional medicine to treat bowel disorders, jaundice, and nausea. All parts have laxative and antiseptic properties.

**The plant**

The tamarind tree is a large tropical evergreen tree in the bean family. It can grow to a height of 98 ft (30 m).

Flowers are yellow and grow in clusters



Leaves and flowers are edible

Pods contain up to 10 seeds surrounded by a sticky pulp

**Block**

The semi-dried fibrous mass of pulp is soaked in hot water, then mashed to a paste and passed through a sieve.



Soak in hot water to obtain a flavored liquid

**Paste**

Prepared pastes are available for convenience. To use, thin the paste by mixing with warm water.



## Spice story

Tamarind is a well-traveled spice: it has been used and traded widely for thousands of years. The Ancient Greek botanist Theophrastus described the plant in his writings on herbal medicine. Its English name comes from the Arabic “*tamr hindi*,” meaning “date of India,” because it reminded Arab sea traders of their native date palm; however, tamarind is in the pea family, and is native to East Africa. It probably arrived in India more than 2,000 years ago, and became established throughout the subcontinent both as an essential cooking spice and as a medicine. Traders brought it to Europe during the Middle Ages, by which time India had become the main supplier. During the 17th century, Spanish explorers carried it to the New World, including the West Indies, where it became important both in cooking and as an ornamental plant.


**Region of cultivation**

Tamarind is native to eastern Africa, possibly Madagascar. It is cultivated in most tropical regions, with India, Thailand, and Sri Lanka being among the main producers.



## Kitchen creativity

In Africa, Asia, the Middle East, and India, tamarind plays an essential role in chutneys, sauces, curries, soups, and drinks. Its fruity-sour taste helps to temper fiery dishes. It is often used as a fruitier-tasting alternative to lemon juice.

### BLENDING SCIENCE

The principal flavor compounds of tamarind are the fruity aldehydes furfural and phenyl acetaldehyde. Having scant supply of oil, there are relatively small amounts of rapidly evaporating flavor molecules, so tamarind has only a mild aroma, but citrusy limonene is present in sufficient amounts for its fragrance to be detected.



### FOOD PARTNERS

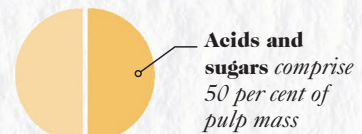
- ⊕ **Vegetables** Drizzle a little tamarind juice into a yogurt dip for cauliflower or onion pakoras.
- ⊕ **Fish** Combine with raw sugar and chilis for a dipping sauce with fish.
- ⊕ **Pork and lamb** Mix paste or juice with soy sauce and ginger as a marinade for pork or lamb.
- ⊕ **Bulgur wheat** Make a dressing with liquid or diluted paste, pomegranate molasses, olive oil, and Middle Eastern herbs and spices, then drizzle over a bulgur wheat salad.
- ⊕ **Drinks** Make your own "tamarind-ade," combining strained liquid with sparkling water or soda, adding sugar to taste, and serving over ice.

### RELEASE THE FLAVOR

Derived from fruit pulp, the distinctive chemical components of tamarind make it an effective flavoring for water-based dishes, and give it a long shelf life.



The principal flavor compounds of tamarind readily dissolve in water—unusual among spices—so there is no need to fry in oil to release the flavors.



**High acid and sugar content** prevents the growth of bacteria, so a block can be stored for a year or more.

#### Don't ditch the seeds!

Tough tamarind seeds can, in fact, be made palatable, and need not be discarded after extracting the "juice" from a block. They have a pleasant peanutlike taste.



**Remove** traces of pulp and roast in a dry frying pan.



**Soak** the seeds in water and peel off the protective coat.



**Boil** the seed kernels, or fry them in oil.



# DATE AND TAMARIND GRANITA WITH CARMELIZED PINEAPPLE

In this innovative ice, warming notes of cumin and garam masala contrast with astringent tamarind, zesty ginger, and the herbal pungency of fresh green chilis. It is a combination inspired by South Asian street food, in which these spices work together as thirst quenchers in the intense heat of high summer.

## SPICE IDEAS

Replace amchoor with ground anardana in the chaat masala to **bring a slightly bitter tang** to the fruity sourness.

Fans of licorice flavors could **add two whole star anise** and a teaspoon of toasted fennel seeds to the date palm syrup.

**Strengthen the ginger** by replacing fresh root with a teaspoon of ground; the nutty warmth of cumin will soften any rough aftertaste.

*Serves 6 as an appetizer*

*Prep time 2 hours*

*Cooking time 30–35 mins*

### For the granita

- ¼ tsp cumin seeds
- ½ cup (125 g) jaggery or palm sugar, chopped
- ¼ cup (50 g) liquid glucose
- 3 cups (750 ml) water
- 1 large lime
- ⅓ cup (75 g) fresh root ginger, peeled and roughly chopped
- ⅔ cup (150 g) seedless tamarind block, broken into pieces
- ½ cup (100 g) pitted dates, roughly chopped
- 2–3 green chilis, chopped, with seeds
- large bunch fresh mint
- ½ tsp garam masala (see recipe p.40)
- ½ tsp black salt

### For the caramelized pineapple

- 4 tbsp powdered sugar
- 2 tsp *chaat masala* (see recipe p.42)
- 1 tsp Kashmiri chili powder or hot paprika
- 10 oz (300 g) fresh pineapple, peeled, cored, and diced

- 1 To make the granita, heat a small, heavy-based frying pan over medium heat and toast the cumin seeds for about 1 minute, until fragrant. Cool, then pound to a powder using a pestle and mortar.
- 2 Put the jaggery or palm sugar, liquid glucose, and water in a saucepan and cook over moderate heat, stirring occasionally, until the sugar has dissolved. Simmer for 3–4 minutes.
- 3 Remove the rind from the lime with a vegetable peeler, taking care not to include any bitter white pith. Add the lime rind, chopped ginger, tamarind, dates, and chilis to the pan. Simmer, uncovered, over medium–low heat for 20 minutes, until softened. Remove the pan from the heat.
- 4 Reserve a few small mint leaves for a garnish, then roughly chop the remaining leaves and stalks and add to the pan. Cover and leave to infuse for 30 minutes.
- 5 Push the pulp through a sieve set over a bowl, discarding anything left in the sieve. Whisk the garam masala, black salt, and ground cumin into the syrup in the bowl. Taste for sweetness and add more sugar if it is too sharp; aim for a balance of sweet and sour flavors.
- 6 Transfer the syrup to a freezerproof container. Leave to cool completely, and then place in the freezer for at least 1 hour, until ice crystals form and it has set.
- 7 Now make the caramelized pineapple. Sift the powdered sugar into a bowl with the *chaat masala* and chili powder. Add the diced pineapple and stir to coat with the spice mix.
- 8 Heat a large, dry frying pan. Shake off any excess spice mix from the pineapple pieces and add the fruit to the pan. Cook over medium heat, stirring frequently, for 5–8 minutes, until the pineapple caramelizes. Transfer the fruit to baking parchment and leave to cool.
- 9 Remove the granita from the freezer and rake it roughly with a fork. Spoon into small glasses and sprinkle each glass with the caramelized pineapple and mint leaves.







# CAROB

*Sweet | Astringent | Chocolatey*

## BOTANICAL NAME

*Ceratonia siliqua*

## ALSO KNOWN AS

St. John's bread, locust bean, locust seed

## MAJOR FLAVOR COMPOUNDS

Pentanoic, hexanoic, and pyruvic acids

## PARTS USED

Dried ripened pods (technically fruits)

## METHOD OF CULTIVATION

Trees grow in orchards and ripe pods are harvested by hand or by shaking them onto nets.

## COMMERCIAL PREPARATION

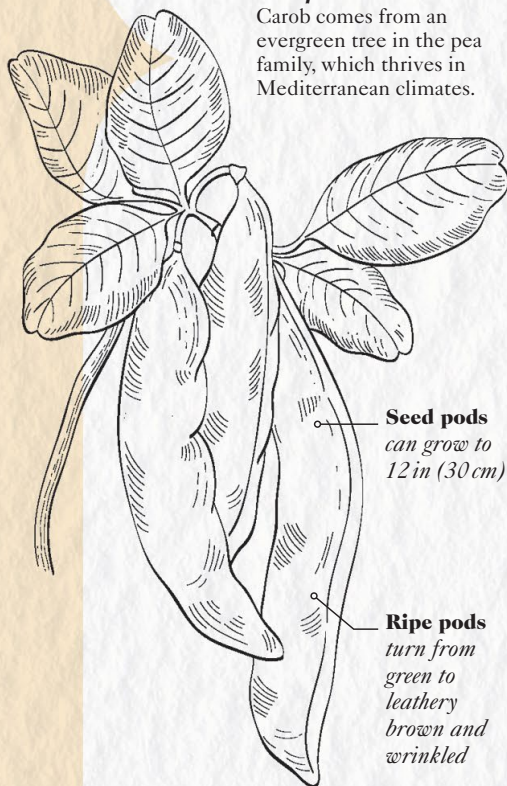
Pods are partially dried and either left whole or crushed to remove the seeds.

## NON-CULINARY USES

Animal feed; cigarette flavoring; seeds are used to make a gelling agent (locust bean gum) employed in food and cosmetics.

### The plant

Carob comes from an evergreen tree in the pea family, which thrives in Mediterranean climates.

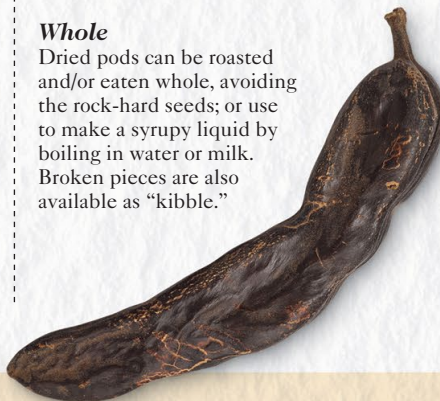


### Powder

Carob powder is usually made with roasted pod and pulp, but is also available raw. The powder will keep almost indefinitely in a sealed container in a cool, dark place.

### Whole

Dried pods can be roasted and/or eaten whole, avoiding the rock-hard seeds; or use to make a syrupy liquid by boiling in water or milk. Broken pieces are also available as "kibble."



## Spice story

The fruit of the carob tree has nourished humans and animals since ancient times. The tree's ability to fruit in poor-quality soil made it important when famine struck, and the Bible mentions its use as livestock fodder. The common names St. John's bread and locust bean derive from the "locusts" that St. John the Baptist was said to have eaten in the desert, which scholars believed were in fact carob pods (though most now think he was eating grasshoppers). The word "carat" originates from the Greek for the carob tree, *keration*: Arab jewelers used the seeds as a unit of weight for gold. The pods were easy to transport, and the Greeks and Arabs took carob west with them. Arabs brought it north to Spain and Portugal, where it was cultivated from the 17th century, and from there it spread to the New World.



### Region of cultivation

Carob is probably native to the eastern Mediterranean and the Levant. It is now cultivated mainly in Spain, but also in Italy (especially Sicily), Portugal, Morocco, Greece, Cyprus, Turkey, and Algeria.

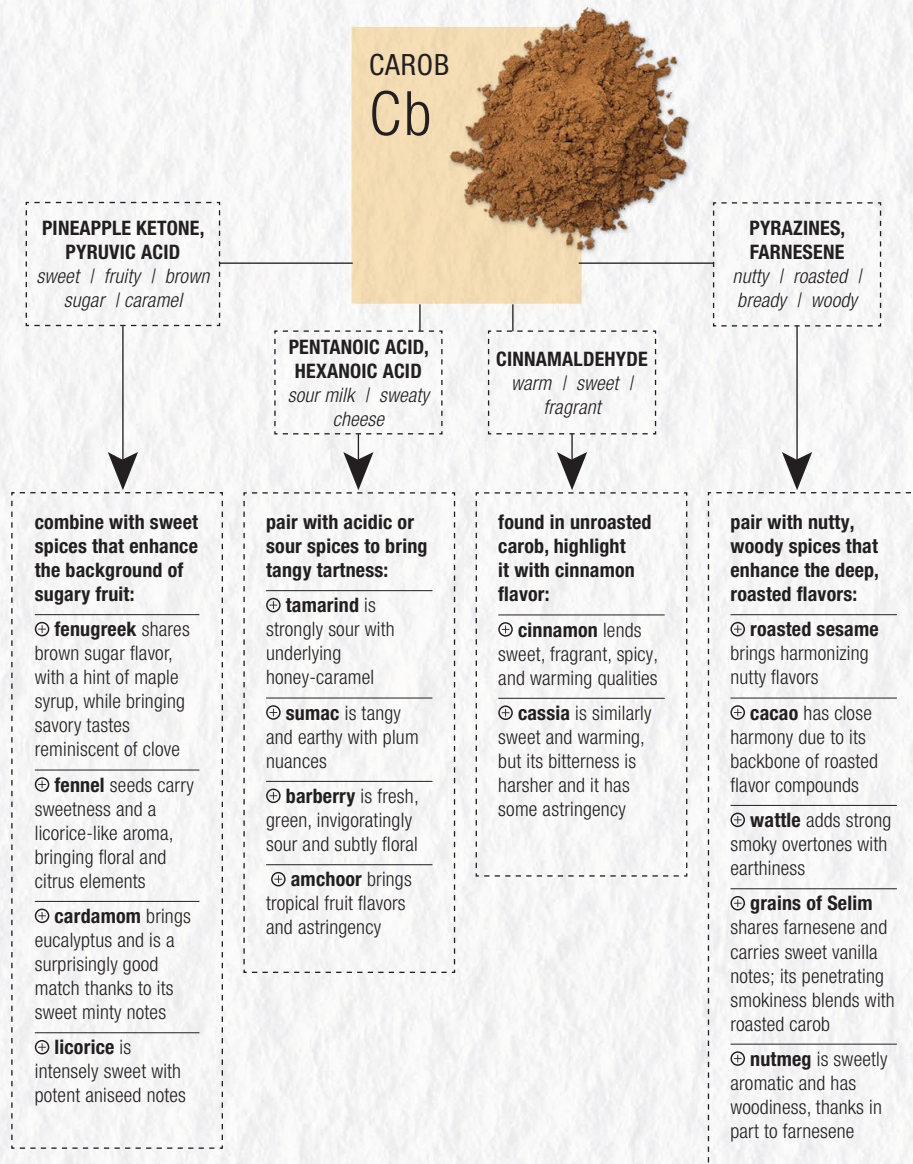


## Kitchen creativity

Sweet and slightly acidic tasting, carob has a rich, warm, almost vanilla-like flavor that vaguely resembles milk chocolate, but it lacks cacao's bitterness, and has an unusual, slightly sour aroma. This spice is a rich source of sugar.

### BLENDING SCIENCE

Pentanoic and hexanoic acids dominate, giving sour milk flavor and "sweaty cheese" aroma, respectively, while pyruvic acid has a brown sugar nuance. Sweet, fruity ketones are also present, including pineapple ketone, as well as warming, spicy cinnamaldehyde, and a terpene called farnesene, which has woody and sweet citrus notes. When roasted, pyrazines give chocolatey, nutty aromas, but cinnamaldehyde is degraded.



### FOOD PARTNERS

- ⊕ **Vegetables** Drizzle carob syrup over grilled or roasted eggplant.
- ⊕ **Meat** Use carob syrup in a barbecue glaze for chicken or lamb, or mix the powder into a rub or marinade.
- ⊕ **Baking** Add carob powder to coffee cake batter and spiced vanilla cookie dough, or stir into a flapjack mixture (remember it is sweeter than cocoa).
- ⊕ **Desserts** Blend frozen bananas with vanilla extract and a spoonful or two of the powder or syrup to make carob banana ice cream.
- ⊕ **Drinks** Blend carob powder with cold milk and ice to make a refreshing alternative to an iced latte.

### RELEASE THE FLAVOR

Whole pods offer most flavor, but should be used according to the nature of the dish. Roasting causes amino acids and sugars to react with each other, creating new nutty, coffee-and-chocolate-like compounds, but reducing sweetness.



**For quick-cook dishes,** grind pods or soak until soft and mash or blend.



**For slow-cook,** liquidy dishes whole pods can be added directly.



**Roast raw pods** for 40 minutes at 300°F (150°C). Reduce the time for kibble and check to prevent burning.



# BARBERRY

*Sour | Sharp | Tangy*

## BOTANICAL NAME

*Berberis vulgaris*

## ALSO KNOWN AS

Piperidge, jaundice berry, *zerezhk*

## MAJOR FLAVOR COMPOUND

Hexanal

## PARTS USED

Dried berries

## METHOD OF CULTIVATION

Fruits are harvested manually, most commonly by hitting the branches with a stick until the berries fall off.

## COMMERCIAL PREPARATION

Berries are dried in the sun, in the shade, or in industrial driers; research shows that driers yield the best-quality spice.

## NON-CULINARY USES

In Iranian traditional medicine to treat jaundice, inflammation, and toothache.

### The plant

This dense and prickly deciduous shrub grows in scrubland and belongs to the berberis family.

Orange-yellow flowers are produced from late spring to early summer

Oblong red berries grow in dense clusters on spiked branches and ripen in autumn

Grows up to 6½–10 ft (2–3 m) tall

Use berries *whole or chopped*, as they are or soaked first



### Dried berries

Only choose berries that are bright red in color, indicating they have been dried carefully and are not overly old. Store them in a sealed container in the freezer for up to 6 months, and defrost as needed.

## Spice story

The earliest record of the use of barberry fruits dates back to 650 BCE, when a description of their blood-purifying properties was inscribed on clay tablets in the library of the Assyrian king Ashurbanipal. The plant's use in Chinese medicine dates back over 3,000 years, and evidence of its medicinal use in Europe has nearly as long a history; for example, the bark from the root and the stem was used as a purgative and tonic. Throughout the Middle Ages, barberry was widely used in preserves, syrups, and wines in western Europe. Later, the herbalist John Gerard (1545–1612) suggested that the berry could be used to season meat—a flavoring idea that has stood the test of time! Barberry was first cultivated in Iran over 200 years ago, and the berries have since become an important part of cooking in the Middle East and the Caucasus.



### Region of cultivation

Barberry is native to central and southern Europe, northwest Africa, and western Asia. It is now cultivated mainly in Iran (which produces more than 11,000 tons of barberry fruits every year), but also in northern Europe and North America.

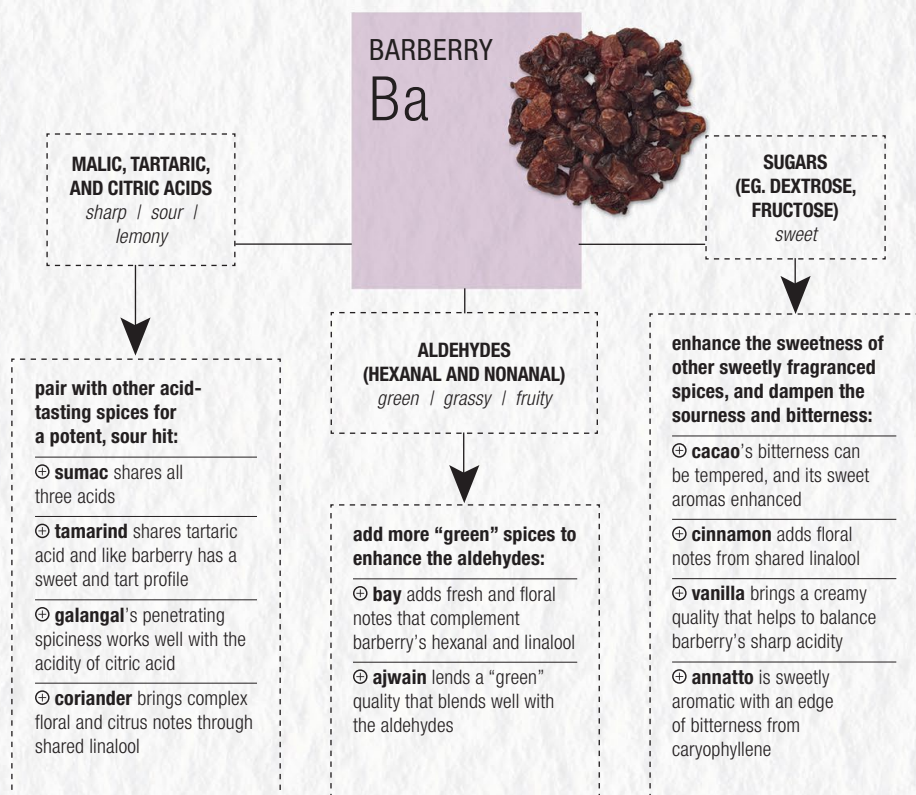


## Kitchen creativity

Barberries tolerate being combined with other strong flavors very well, and add zing to all kinds of savory and sweet dishes. Their jewellike appearance also makes them an attractive decoration.

### BLENDING SCIENCE

Containing high levels of acids and sugars, dried barberries are a versatile flavoring that straddles the sweet-sour spectrum. The ability of sugars to reduce taste bud sensitivity to bitterness and sourness, alongside a bouquet of flavor compounds, including herby hexanal and floral linalool, offer a wide variety of spice-pairing options.

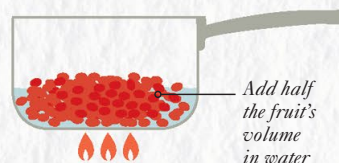


### FOOD PARTNERS

- ⊕ **Salad** Crush the dried berries and sprinkle them over salads.
- ⊕ **Red meats** Crush barberries with salt and use as a rub for lamb, beef, or game.
- ⊕ **Pilaf** Soak the dried berries and then fry them in butter before adding to rice to make a pilaf.
- ⊕ **Preserves** Use fresh berries to make a fruit "leather" by boiling down the fruit, straining it, and spreading it out on a tray to dehydrate.
- ⊕ **Drinks** Add a syrup made with the dried berries to refreshing cool drinks.

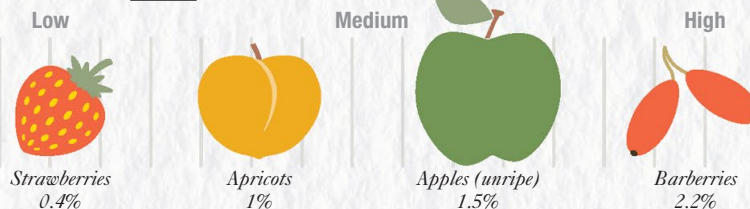
### RELEASE THE FLAVOR

Berries can be rehydrated before cooking to dilute their sharpness and speed up the release of flavor compounds. Soak in cold water for 10 minutes or simmer briefly in a little boiling water.



### Pectin powerhouse

Pectin is the chemical glue that holds plant cells together, and it is present in all fruits in varying amounts. When fruits are cooked in sugar and water, pectin seeps out and reforms into a gluey gel when cooled—the basis for a jam. Barberries are high in pectin, and their acidity causes it to be quickly released. Flavoring jams and jellies with barberries thus helps to achieve a quick, strong set, particularly for medium- to low-pectin fruits.



COMPARATIVE PECTIN LEVELS



# CACAO

*Earthy | Floral | Bittersweet*

**BOTANICAL NAME**

*Theobroma cacao*

**ALSO KNOWN AS**

Cocoa

**MAJOR FLAVOR COMPOUND**

Isovaleraldehyde

**PARTS USED**

Seeds (also known as “beans”)

**METHOD OF CULTIVATION**

Ripe fruits are harvested with a special cutting hook mounted on a pole.

**COMMERCIAL PREPARATION**

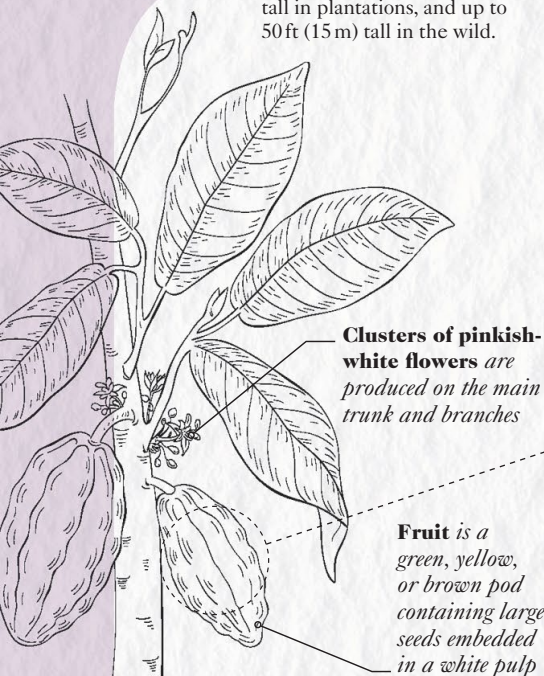
The bitter raw seeds are fermented to develop palatable flavors, then dried—often next to open wood fires—roasted, and cracked to release the inner kernel.

**NON-CULINARY USES**

In traditional medicine as a powerful stimulant; in modern medicine reported to protect against cardiovascular disease.

**The plant**

Cacao is a broad-leaved, tropical evergreen tree in the mallow family. It grows up to 23 ft (7 m) tall in plantations, and up to 50 ft (15 m) tall in the wild.



Clusters of pinkish-white flowers are produced on the main trunk and branches

Fruit is a green, yellow, or brown pod containing large seeds embedded in a white pulp

Use nibs whole, chop roughly, or grind to a coarse powder in a pestle and mortar


**Nibs**

Cacao nibs are broken pieces of the unsweetened inner kernel of the cacao seed. They are available pre-roasted or raw (see Release the Flavor).

## Spice story

There is evidence that cacao was being used by the Olmec people of southern Mexico as early as 1500 BCE. By 600 BCE, the Olmec had introduced cacao to the Maya of Yucatan, who used it as a source of nourishment. They traded cacao to the Aztecs, who turned the beans into a thick, unsweetened drink. When the Spanish invaded Yucatan in the early 16th century they recognized that cacao was a precious commodity, and began sweetening it with cane sugar. The first recorded shipment of cacao beans to Europe reached Spain in 1585. Within a century, chocolate beverages were being consumed across Europe, long before coffee and tea. The first ever solid chocolate bar was manufactured by Fry's of Bristol in England in 1847.


**Region of cultivation**

Cacao is native to tropical Central and South America. More than 50 percent of the world's total crop is now produced in the Ivory Coast and Ghana, but many other tropical countries cultivate cacao, including Ecuador, Brazil, Peru, Colombia, Mexico, Dominican Republic, and Indonesia.

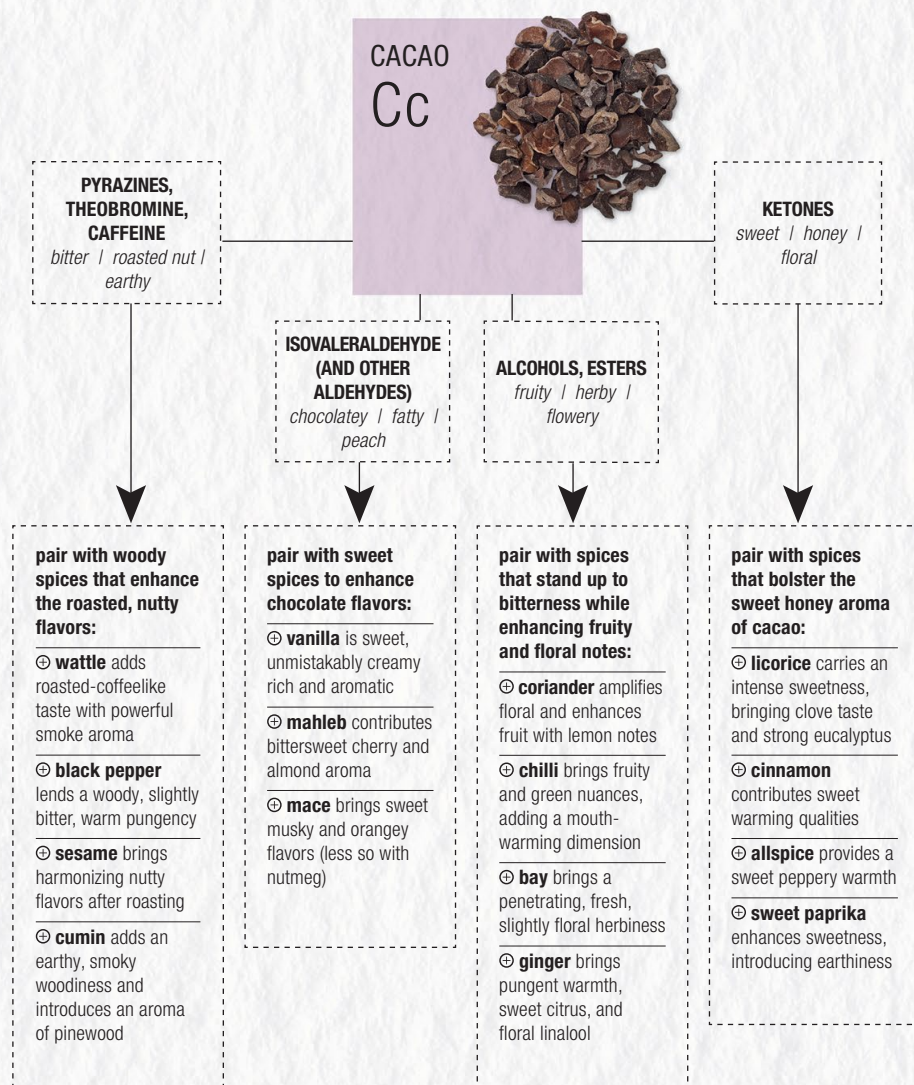


## Kitchen creativity

One of the most complexly flavored foods, cacao nibs are earthy, bitter, and fragrant, but unlike chocolate they do not melt without grinding to a paste. They have a nutlike crunchy texture and can be used whole, chopped, or ground to a coarse powder.

### BLENDING SCIENCE

Cacao contains about 600 flavor compounds, and their relative amounts vary by region, tree variety, and processing method. Bitterness is partly produced by two stimulant compounds, caffeine and theobromine, which turn into bitter pyrazines on roasting. Cacao also contains sweet-tasting aldehydes and ketones, as well as fruity alcohols and phenols. Pyrazines also give the spice its roasted, nutty flavors.

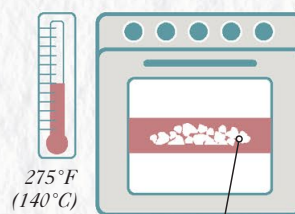


### FOOD PARTNERS

- ⊕ **Fennel, pumpkin** Sprinkle nibs over a fennel and blood orange salad, or grate over pumpkin and sage ravioli.
- ⊕ **Squid** Add roughly ground nibs to a tempura batter for squid.
- ⊕ **Meat** Rub ground toasted nibs onto steak before grilling; add to Italian *agrodolce* sauce for duck or pork; mix into a fruity, spicy lamb tagine.
- ⊕ **Sweet baked goods** Add nibs to banana bread, pancakes, or cookies.
- ⊕ **Cheesecake** Add nibs to the cookie base ingredients for a savory or sweet cheesecake.

### RELEASE THE FLAVOR

Unroasted (“raw”) cacao nibs are not sweet and much more bitter than chocolate. Roasting them before use helps to remove some of the bitterness.



Roasting also creates nutty pyrazine flavors

Roast nibs in an oven at 275°F (140°C) for 10–15 minutes.

### BLEND TO TRY

Use and adapt this classic blend featuring cacao:

**Mole mix** p.65



# PAPRIKA

*Bittersweet | Earthy | Fruity*

**BOTANICAL NAME**

*Capsicum annuum*

**ALSO KNOWN AS**

Hungarian pepper, *pimentón*

**MAJOR FLAVOR COMPOUNDS**

Pyrazine combinations

**PARTS USED**

Fruits

**METHOD OF CULTIVATION**

Fruits of chili peppers are harvested in summer when they are red and ripe.

**COMMERCIAL PREPARATION**

Fruits are dried then ground. Peppers for smoked paprika are hung in smokehouses before processing.

**NON-CULINARY USES**

In cosmetics and pharmaceuticals for its pigment and the inflammation-reducing properties of capsaicin.

**The plant**

Paprika comes from chili pepper plants, which are frost tender, herbaceous perennials in the nightshade family, and grow well in warm, dry climates.

Plants reach a height of around 2½ft (80cm)

Fruits are fleshy and hollow

Varieties differ; some have small, round fruits



← Hungarian

Grades range from *erős*, the spiciest, to *különleges*, the mildest

Three main varieties are *picante* (hot), *dulce* (sweet), and *agridulce* (bittersweet)

Spanish →


**Powder**

There are two main types of paprika: Hungarian, which is bright- or rust-red and with pronounced fruitiness; and Spanish—known as *pimentón*—which is darker and sweeter. Both are available smoked.

## Spice story

Capsicum peppers probably originated in Mexico, where recent cave findings suggest they were being eaten as far back as 7000 BCE. In the late 15th century CE, explorer Christopher Columbus shipped peppers back to Europe from the Caribbean. Spanish monks started drying and grinding the fruits, and one of the world's best smoked paprikas is still made in La Vera valley in Extremadura, where ripe peppers are hung in smokehouses in the fields and ground in ancient stone mills. The Ottoman Turks introduced peppers to Hungary and by the mid-1800s Hungarians had adopted paprika as their national spice and made it a key ingredient of goulash, a rustic meat soup. French chef Georges Escoffier is credited with introducing paprika to the wider culinary world: he had it shipped from Hungary to his Monte Carlo restaurant in 1879 and put *poulet au paprika* on the menu.


**Region of cultivation**

Peppers are native to South and Central America, but peppers for paprika are grown and processed chiefly in Hungary, Spain, the Netherlands, and Turkey.



## Kitchen creativity

The various varieties of paprika are appreciated for their earthy and smoky flavors, spicy heat, and the sweet taste of the fruit's sugars. Choose very mild paprika to harness the rust-red pigment without changing the flavor of a dish.

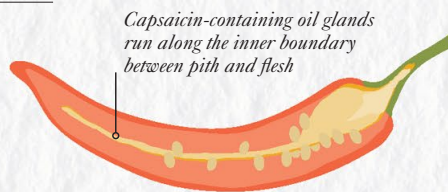
### BLENDING SCIENCE

Paprika's tang derives from sour-tasting citric acid, its sweetness from sugars and the rumlike flavor compound ethyl acetate, and its rich earthiness from pyrazines, many of which develop during the drying and/or smoking. From sweet and fruity, to bitter and smoky, the range of different types of paprika gives a wealth of pairing opportunities.



### Mild or hot?

Chili heat comes from capsaicin molecules, most of which reside in the whitish pith. The degree of heat or mildness in paprika depends on capsaicin levels in the chili variety used and how thoroughly the pith has been removed in processing. Poor quality hot paprika is often made from whole dried fruits, including stems, pith, and bitter seeds.

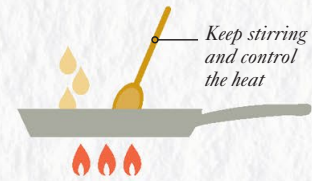


### FOOD PARTNERS

- ⊕ **Plums** Add smoked paprika to a sweet-sour plum sauce.
- ⊕ **Roasted roots** Serve roasted Jerusalem artichokes with a smoked paprika *aioli*, or salt-baked new potatoes with a *mojo picón* sauce, which includes paprika, cumin, chilis, and garlic.
- ⊕ **Squid, octopus** Sprinkle hot paprika into the batter for fried squid or add to a Moroccan *chermoula* (herby marinade) for grilled octopus.
- ⊕ **Meat** Sprinkle smoked paprika and chopped herbs onto roasted marrow bones; add to pork or duck rillettes; rub into beef brisket before slow-cooking; make an offal *paprikash*.

### RELEASE THE FLAVOR

Paprika is high in carotenoids (similar to carrots' orange pigment), which, along with its most fragrant flavor compounds, dissolve well in oil. Hence frying with oil at the start of cooking helps spread color and flavor through a dish.



The powder's small particle size means it burns easily. Smoked varieties are already slightly bitter and prone to develop acid bitterness from scorching.

### BLENDS TO TRY

Use and adapt these classic recipes:

**Jamaican jerk rub** p.68

**Chimichurri** p.70

**BBQ rub** p.72



# WATTLE

*Roasted | Woody | Musty*

## BOTANICAL NAME

*Acacia victoriae*  
(most commonly used species)

## ALSO KNOWN AS

Gundabluë wattle

## MAJOR FLAVOR COMPOUNDS

Pyrazine compounds

## PARTS USED

Seeds

## METHOD OF CULTIVATION

Ripe pods are dislodged using a mechanical tree shaker or beating by hand with a stick.

## COMMERCIAL PREPARATION

Seeds are separated from pods by threshing and sieving, then dried and roasted.

## NON-CULINARY USES

Has been used as animal feed; fruits, seeds, and gum from wattle trees used in traditional Aboriginal medicine for many ailments.

### The plant

Edible wattle seeds are produced by a small number of evergreen shrubs or small trees in the bean family.

**Cream-colored flowers** are edible and sometimes used as a culinary decoration

**Green pealike pods** turn brown or yellow and become papery and brittle as they ripen

**Wattle is both flavorful and high in protein** (about 20 percent)



### Powder

This robust spice is usually bought ground as a coarse, dark brown powder that resembles ground coffee. It can be stored in a sealed container in a cool, dark place for up to two years.

## Spice story

Wattle has been used as a staple food by the aborigines of Australia for at least 4,000 years. Only a few of the hundreds of acacia species that grow in Australia have edible seeds, and some others are toxic. Over a period of thousands of years, the indigenous population identified the edible species. They either ate the seeds fresh, straight from the pod, or dried and roasted or baked them, crushing them between grinding stones to produce flour. Increasing commercial interest in the seeds has led to the development of small-scale plantations in Australia, although a significant proportion of the crop is still harvested from wild trees. As “bush food” increasingly features on Antipodean restaurant menus, wattle’s importance as a culinary spice has grown.



### Region of cultivation

*Acacia victoriae* and other edible species of wattle are native to arid and semi-arid regions of Australia. They are cultivated in South and Western Australia, Victoria, and New South Wales.

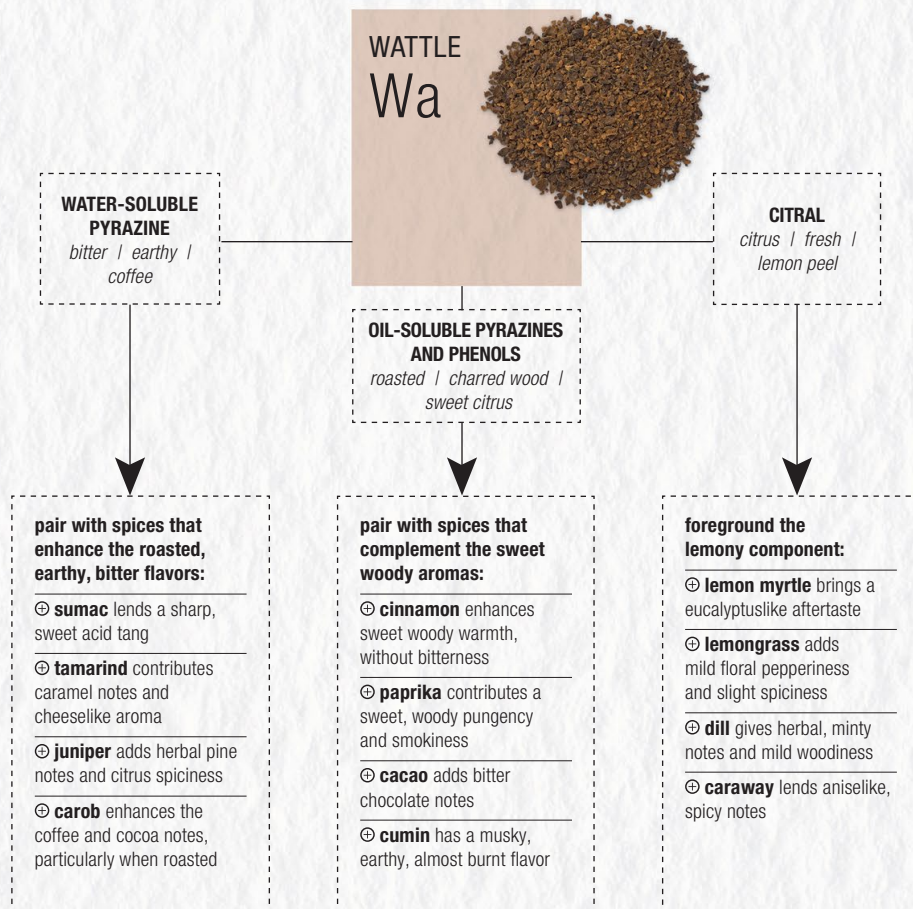


## Kitchen creativity

Wattle has a unique nutty, roasted coffeelike taste with a lightly charred woody and smoky aroma, plus notes of popcorn and sweet citrus. The complex flavors of this spice work well with both sweet and savory recipes.

### BLENDING SCIENCE

The flavor profile of wattle is dominated by a water-soluble pyrazine with a bitter, musty, earthy, roasted-coffee flavor with hints of cocoa, and an oil-soluble pyrazine with a sweet, nutty, charred wood taste with hints of popcorn. Some intensely lemon-flavored citral and bitter-tasting phenols are also present.



### RELEASE THE FLAVOR

Wattle does not need to be fried or toasted as the nutty, roasted flavors have already been released during processing. The flavor depends instead on the balance of water and fats within a dish.



**Cooking in fats** decreases the levels of bitter phenols, and releases lemony citral and the nutty, oil-soluble pyrazines.



**Cooking in water-based liquids** releases the water-soluble pyrazine and some of the bitter-tasting phenols, resulting in bitter, earthy, roasted-coffee flavors with hints of cocoa.



Stovetop espresso

**Maximize** water-based flavors while reducing bitterness by using ground wattle like coffee in an espresso machine and cooking with the liquid extract.

### FOOD PARTNERS

⊕ **Potatoes** Sprinkle wattle over roasted sweet potato chips or potato wedges.

⊕ **Custard** Infuse custard with wattle, and then turn it into ice cream or serve it warm over sweet sponge pudding.

⊕ **Meat** Add wattle to a dry spice rub or marinade for chicken, lamb, or beef.

⊕ **Breads** Add a sprinkle of wattle to give a nutty sweetness to bread doughs and sweet yeast breads.

⊕ **Tuna** Include wattle in a spice crust for tuna before pan searing.

⊕ **Chocolate** Wattle works well in anything chocolatey—try adding it to chocolate mousse or a chocolate ganache.



# SESAME

*Nutty | Bittersweet | Rich*

**BOTANICAL NAME**

*Sesamum indicum*

**ALSO KNOWN AS**

Benne, sesamum, gingelly, sim-sim

**MAJOR FLAVOR COMPOUNDS**

Pyrazine combinations

**PARTS USED**

Seeds

**METHOD OF CULTIVATION**

Whole plants are cut just before the seed capsules (technically fruits) are fully ripe.

**COMMERCIAL PREPARATION**

Stalks are dried, threshed, capsules split open, and the seeds shaken out.

**NON-CULINARY USES**

Sesame oil is used as a base in cosmetics and perfumery. The mildly laxative seeds are used in traditional Asian medicine to treat indigestion and arthritis.

**The plant**

Sesame is a tropical, annual plant in the pedaliaceae family. It grows to a height of 3–6ft (1–2m).

**Flowers** are trumpet-shaped and can be white, pale pink, or purplish

**Seed capsules** are oblong and contain 50–100 flat seeds


**White**

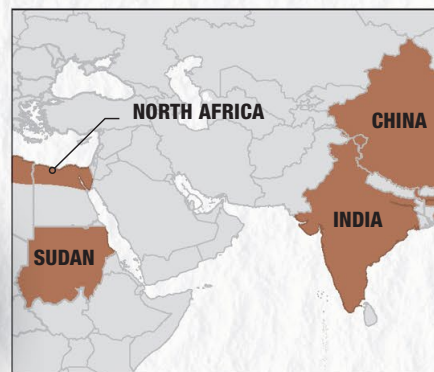
These are sold hulled or unhulled, and toasted or untoasted. Raw seeds have almost no aroma; roasting brings out their nutty taste.


**Black**

This type of unhulled seed is popular in Chinese and Japanese cookery, and sold toasted or untoasted.

## Spice story

Sesame was first cultivated more than 4,000 years ago and was prized by many ancient civilizations. The Babylonians and Assyrians used sesame both in cooking and in religious rituals—in Assyrian mythology, the gods drank sesame wine the night before they created the world. Ancient Egyptians used the oil as a medicine, and ground the seeds for flour. Seed remains were found in Tutankhamun’s tomb. In Rome, soldiers carried the energy-giving seeds as emergency rations, and cooks ground them into a pastelike condiment flavored with cumin. In the famous Arabian folk tale, when Ali Baba cries “Open, sesame!” a cave is unsealed to reveal a stash of jewels. This probably alludes to the way ripe seed pods burst open at the slightest touch, scattering their seeds. Sesame traveled to North America and Mexico with the slave trade, and was being grown in colonial America by 1730.


**Region of cultivation**

Sesame plants originated in sub-Saharan Africa. Sesame is cultivated in China, India, North Africa, North America, Central and South America, and Sudan.

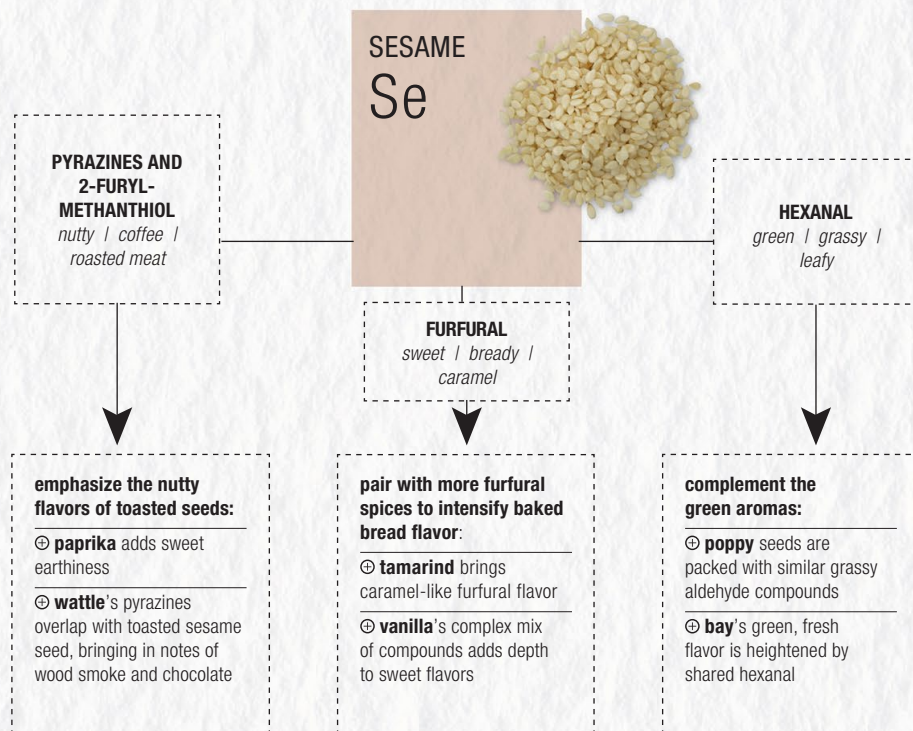


## Kitchen creativity

Sesame is used in everything from sweets such as Indian *til laddoos* and Middle Eastern *haka* to savory dips and dressings such as tahini and hummus. The Japanese sprinkle *gomashio*, a sesame-and-salt condiment, over rice and noodles.

### BLENDING SCIENCE

Untoasted sesame seeds carry very subtle flavors from compounds such as furfural and hexanal. When roasted or toasted, proteins and sugars on the outer layers of the seed react with one another to form hundreds of new compounds, including nutty, flavorful pyrazines.

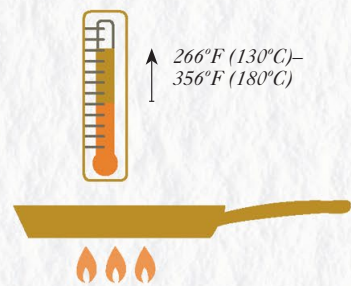


### FOOD PARTNERS

- ⊕ **Bananas and apples** Sprinkle toasted seeds over apple or banana fritters.
- ⊕ **Vegetables** Sprinkle black seeds over a noodle and vegetable salad with a spicy Szechuan dressing, or scatter over roasted kale or asparagus.
- ⊕ **Oily fish** Coat tuna or salmon in seeds before pan frying.
- ⊕ **Chicken** Coat chicken legs in a ground black sesame, soy, and honey glaze before baking or grilling.
- ⊕ **Pulses** Roll falafel in raw seeds before cooking.
- ⊕ **Baking and sweets** Sprinkle raw seeds over bread dough before baking, or make sesame brittle with honey, butter, and white seeds.

### RELEASE THE FLAVOR

When sesame seeds are toasted, proteins and sugars on the outer layers react to form new compounds, including roasted-nut pyrazines and the sulfurous, coffee- and roasted meat-like 2-furylmethanethiol.



**Proteins and sugars** react together at temperatures above 266°F (130°C). Fats inside the seeds burn and produce acrid flavors at around 356°F (180°C), so toast with care.

### Black or white?

Darker seeds carry heavier, spicier aromas and are better suited for savory recipes. Pale varieties are ideal for mixing with milder spices and for cooking with butter. Unhulled seeds have a faint bitterness, due to oxalates in the external layers, designed to deter pests.



**Higher concentrations** of phenolic defence compounds alongside the pigments convey a stronger, slightly bitter flavor.



**Pale sesame seed** varieties have slightly less oil and more moisture, giving them gentler flavors of honey, caramelized milk, and vanilla.



# BLACK SESAME, LICORICE, AND CARDAMOM ICE CREAM

This recipe blends three spices to create a creamy, subtly aromatic ice cream that is flavorful and not too sweet. Its nutty, toasted-sesame taste is enhanced by a hint of licorice and floral cardamom. Adding alcohol makes the ice cream softer straight from the freezer, but you can omit it if you prefer.

## SPICE IDEAS

Use **white sesame seeds** instead of black for less bitterness, and **leave untoasted** to allow honeyed, more floral flavors to gain greater prominence.

Replace a proportion of sesame seeds with **wattle** to bring in notes of chocolate and wood smoke.

Pick up on leafy green hexanal in sesame and eucalyptus-like cineole in cardamom by using **ground bay leaves** in place of licorice.

*Serves 4*

*Prep time 20 mins*

*Freezing time 20–30 mins  
in ice-cream maker  
(remember to pre-freeze the  
bowl, if applicable); 3–4  
hours minimum in freezer*

3 heaped tbsp black sesame seeds  
¾ cup (300 ml) heavy whipping cream  
¾ cup (300 ml) Greek yogurt  
¾ cup (300 ml) condensed milk  
seeds of 30 cardamom pods, ground  
1½ tsp licorice root powder  
1½ tbsp white rum or other lightly  
flavored spirit (optional)

- 1 Toast the sesame seeds in a dry frying pan over medium heat for about 5 minutes, then leave to cool.
- 2 Using a spice grinder or small food processor, grind the seeds until they form a powdery paste—this will take about 1 minute.
- 3 In a large bowl, whip the double cream until it forms soft peaks. Set aside.
- 4 In another bowl, beat together the yogurt, condensed milk, ground cardamom, licorice powder, and sesame paste. Gently fold this mixture into the cream. Stir in the alcohol, if using.
- 5 Pour the mixture into an ice-cream maker and churn according to the instructions. Transfer the ice cream to a freezerproof container and freeze until ready to serve. Alternatively, pour the mixture into a freezerproof container and freeze for 3–4 hours, stirring at regular intervals to break up the ice crystals and ensure a smooth ice cream.







# GARLIC

*Pungent | Sulfurous | Sweet*

**BOTANICAL NAME**

*Allium sativum*

**ALSO KNOWN AS**

Camphor of the poor, stinking rose

**MAJOR FLAVOR COMPOUND**

Allicin

**PARTS USED**

Bulb

**METHOD OF CULTIVATION**

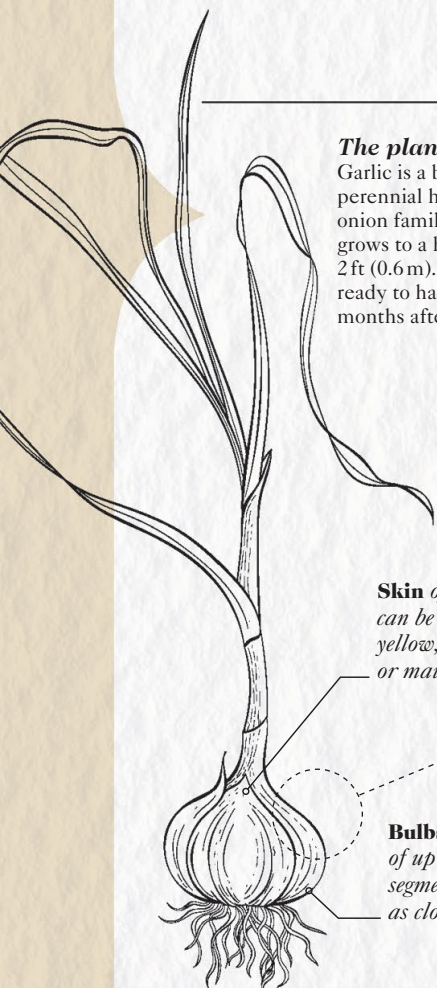
The bulbs are harvested when around half the leaves have turned yellow.

**METHOD OF PREPARATION**

Bulbs are stored in a cool, shady place for 10–20 days so that they lose about one-fifth of their water content.

**NON-CULINARY USES**

Modern research shows garlic improves cholesterol levels and slightly reduces high blood pressure.


**The plant**

Garlic is a bulbous perennial herb in the onion family that grows to a height of 2 ft (0.6 m). Bulbs are ready to harvest 5–9 months after planting.

Skin of the bulb can be white, yellow, pink, or mauve

Bulbs consist of up to 24 segments known as cloves


**Dried**

Dried garlic can be flaked, powdered, or granulated, but all lack the pine and citrusy subtleties of the fresh spice, leaving only the main garlicky sulfur flavors.

Store in a cool, dark place, but no need for refrigeration


**Fresh**

Mature bulbs tend to have more potent flavor, but avoid any that are showing green shoots (see right).

## Spice story

This most potent spice has been prized for over five millennia, by virtually every civilization—the Greek physician Galen praised it as “the great panacea.” An Egyptian medical papyrus from about 1550 BCE features 22 different garlic formulas for various ailments. The slaves who built the Egyptian pyramids were given garlic to sustain them and prevent disease. The Chinese cultivated garlic for its stimulating and healing properties, while Roman soldiers ate it before battle for courage and strength. In folklore, garlic has been seen both as a protector from evil spirits or vampires, and as a symbol of the Devil. As a food, its popularity has waxed and waned; it was shunned at Roman and Greek feasts because of its powerful odor, but over time, garlic became integral to many regional cuisines, including Indian and Mediterranean.


**Region of cultivation**

Probably native to Central Asia, China is now the largest producer and exporter of garlic, followed by India, South Korea, Russia, and the US.

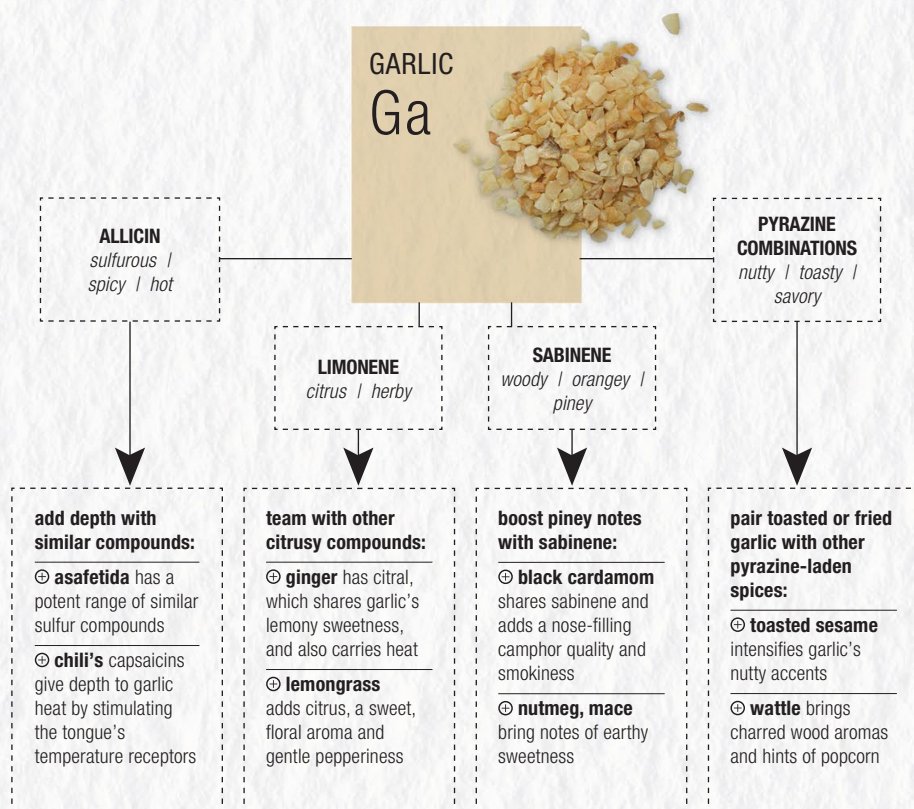


## Kitchen creativity

Garlic amplifies and unites other flavors while having its own distinctive taste that gives depth to many savory dishes. Essential to many cuisines, with onions and ginger it forms the “trinity” at the heart of much Asian cooking.

### BLENDING SCIENCE

Garlic's pungency derives mainly from its sulfur-containing flavor compounds; these have significant crossover with cooked meats, which also contain sulfur compounds. Smaller amounts of gently aromatic terpenes are also present, including limonene and sabinene. Toasting creates nutty-flavored pyrazines.



### FOOD PARTNERS

- ⊕ **Roasted lamb** Before roasting, make slits all over the joint and insert slices of fresh garlic.
- ⊕ **Soup** Roast a foil-wrapped garlic head in the oven, then squeeze out the sweet pulp and add to pumpkin or other vegetable soups.
- ⊕ **Prawns** Add to an oily marinade for grilled or barbecued prawns.
- ⊕ **Raw vegetables** Pound garlic with anchovies and olive oil to make the Provençal paste *anchoïade*, and serve with crudités.
- ⊕ **Chickpeas** Add roasted or raw cloves to the mortar or blender when making hummus.

### BLENDS TO TRY

Use or adapt these recipes for classic blends featuring garlic:

- Niter kibbeh** p.32
- Mbongo mix** p.35
- Nuoc cham** p.50
- Shichimi-togarashi** p.57
- BBQ rub** p.68

### Bitter sprouts

When garlic cloves sprout, they become more bitter. The plant has begun stockpiling defensive bitter-tasting substances, such as phenols and sulfur compounds. Reduce bitterness by cutting out the green shoot before cooking.



### RELEASE THE FLAVOR

A damaged garlic clove releases chemicals that react together to create alliin, the pungent compound we most associate with a “garlicky” flavor. Chopping, crushing, and puréeing produce progressively higher amounts of alliin.



**Leave** for 60 seconds after crushing or chopping, so alliin levels rise to a peak.



**Uninjured cloves** do not contain alliin. Cook whole for mild, sweet flavors.



**Vegetable oils** spread the strongest compounds while butter aids its gentler flavors.

Below 350°F  
(180°C)



**Avoid** cooking garlic above 350°F (180°C) to prevent bitterness.



# ASAFETIDA

*Sulfurous | Oniony | Garliclike*

## BOTANICAL NAME

*Ferula assa-foetida*

## ALSO KNOWN AS

Devil's dung, stinking gum, *hing*

## MAIN FLAVOR COMPOUNDS

Sulfides

## PARTS USED

Taproot: a resin is produced from the coagulated sap

## METHOD OF CULTIVATION

In spring, the stalk base is cut to expose the top of the taproot, which is "milked" every few days for its sap.

## COMMERCIAL PREPARATION

The sap is dried to form a dark resin, most of which is ground to a powder and mixed with rice flour and gum arabic.

## NON-CULINARY USES

In traditional medicine to relieve flatulence and to treat lung conditions.

### The plant

Asafetida is derived from several giant fennel species of the genus *Ferula*, in the carrot family. The plant emits a distinctly foul smell.

Leaves and stems are edible, and occasionally eaten as a vegetable in Iran

Huge, carrot-like roots can be 6 in (15 cm) in diameter



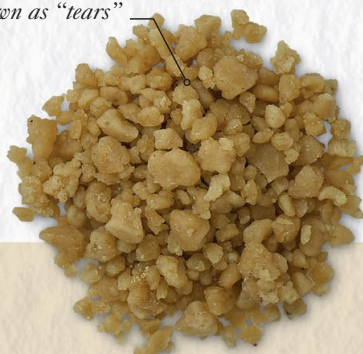
### Ground

Commercial powders are mixed with rice flour, both to prevent the starch-rich spice from clumping and to dilute the flavor for greater control when using the spice.

### Whole

In its purest form, asafetida can be bought as small pieces of dried resin, which may be ground or used with water or steam to impart flavor.

Brittle chunks of pure resin are known as "tears"



## Spice story

Asafetida was discovered in Persia in the 4th century BCE by Alexander the Great's soldiers, who mistook it for silphium, a widely used ancient spice from a similar, and now extinct, plant. They took it to Asia and the Mediterranean region, where it became very popular with the Greeks and Romans as a substitute for silphium. Asafetida was prized both as a seasoning and for its health-giving properties, and is cited in many of the recipes in *Apicius*, a Roman cookbook from the 1st century CE. After the fall of the Roman Empire, it never regained popularity in Europe, but its use was recorded again, centuries later, in the *Baghdad Cookery Book* (1226). In the 16th century, the Mughals are reported to have taken the spice to India, where it became an indispensable element of vegetarian and Ayurvedic cuisine throughout the subcontinent.



### Region of cultivation

Asafetida is native to the mountains of Central Asia, from Turkey, Iran, and Afghanistan to Kashmir. It is cultivated mainly in Afghanistan, but also in Iran, Pakistan, and Kashmir. Most of the world's crop is imported by India.

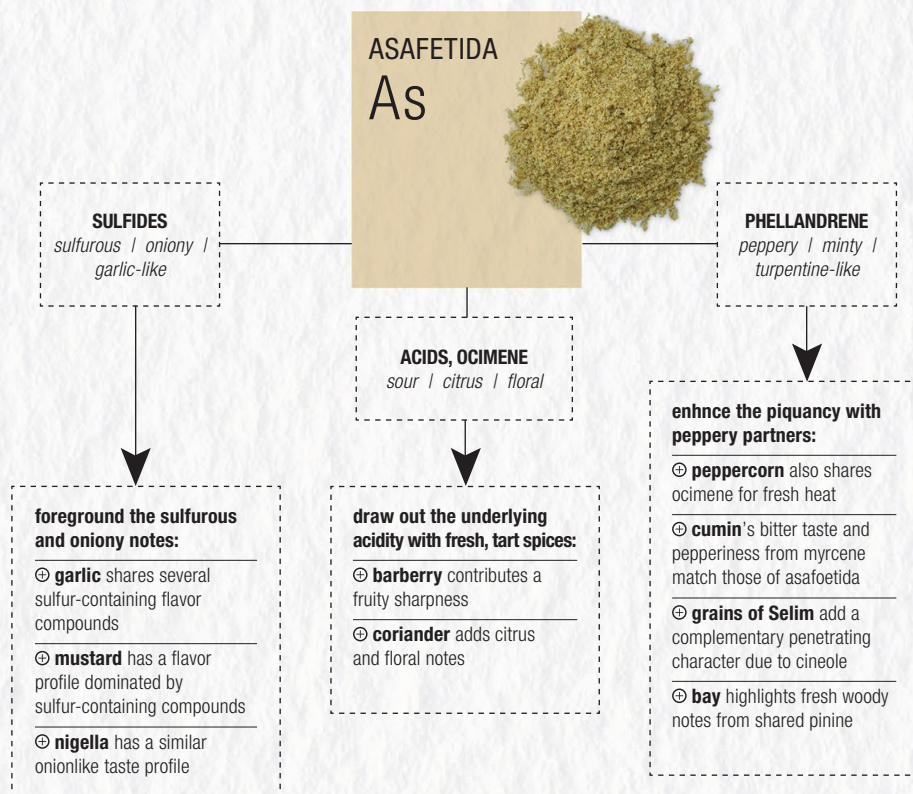


## Kitchen creativity

When asafetida is heated in fat, it develops a similar flavor to fried onions and garlic. Because traces of the same sulfurous flavor compounds (sulfides) are found in meat, asafetida can also bring a meaty depth to vegetarian cooking.

### BLENDING SCIENCE

Asafetida's flavor-carrying oils are dominated by sulfides, which provide its fried onion smell, making it a suitable partner for similarly flavored spices, such as garlic. Minor compounds contribute more subtle hints of flavor but serve as a helpful guide for further pairings.



### FOOD PARTNERS

- ⊕ **Beans and pulses** Fry asafetida in ghee with other warm spices for a moong lentil dhal.
- ⊕ **Chicken and lamb** Add asafetida to a yogurt marinade for baked or barbecued chicken or lamb.
- ⊕ **Fish** Sprinkle asafetida over fish kebabs before grilling.
- ⊕ **Vegetables** Add a small pinch of ground asafetida to give depth to a slow-cooked onion soup; sprinkle a little ground asafetida into cooling oil when making a cauliflower, mushroom, or potato curry.
- ⊕ **Preserves** Add a pinch of asafetida and turmeric to a pineapple, tomato, or mango pickle or chutney.

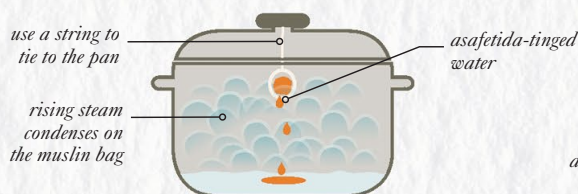
### BLENDS TO TRY

Try these recipes for classic blends featuring asafetida, and why not adapt them with some blending science?

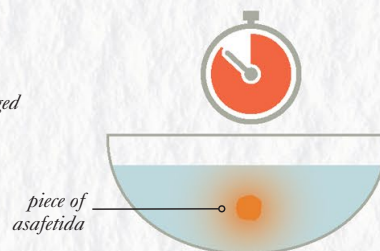
**Chaat masala** p.42  
**Gunpowder** p.45

### CONTROL THE FLAVOR

Asafetida's potent oil-based sulfur compounds dissolve very slowly in water, a fact that can be exploited to control the strength of flavor when using whole chunks of resin.



Place a "tear" in a muslin bag and tie it to the underside of the pan lid. Drops of asafetida-tinged water will drip down into the cooking liquid.



Steep a "tear" of the spice in water for several hours to give a flavored water that will be much milder than the raw spice.



# CURRY LEAF

*Meaty | Warm | Floral*

## BOTANICAL NAME

*Murraya koenigii*

## ALSO KNOWN AS

*Karapincha, meetha neem, kari patta.* Not to be confused with the inedible “curry plant”.

## MAJOR FLAVOR COMPOUND

1-phenylethanethiol

## PARTS USED

Leaves (more accurately leaflets)

## METHOD OF CULTIVATION

Leaves are harvested in early summer, before flowering, from trees that are at least three years old.

## COMMERCIAL PREPARATION

Fresh leaves are vacuum-packed on their stems and chilled or frozen, or washed and air-dried for 4–5 days.

## NON-CULINARY USES

In cosmetics and in traditional medicine as a digestive aid.

## The plant

Curry leaves come from a small, deciduous tropical tree in the citrus family.

**Black berries**  
are borne at the  
ends of branches

**Leaves are**  
divided into  
pairs of leaflets

**Leaflets are**  
dark green, shiny,  
and strongly  
aromatic



## Dried

Although some recipes say dried leaves can substitute for fresh if double the quantity is added, they really have very little flavor and are best avoided.

## Fresh

Leaves are best bought fresh, on the stem. Store in a sealed bag for a week in the fridge, or near indefinitely in the freezer.

**Leaves**  
should be  
bright green  
without dark  
blotches



## Spice story

Curry leaf has a special place in the cuisines of southern India, Sri Lanka, and Malaysia. When the Dravidians of northwest India moved south in around 1000 BCE, they brought with them rice, mustard seeds, and pulses to plant in their new home, and then started combining them with the indigenous curry leaves. The use of curry leaf as flavoring for vegetables is documented in early Tamil literature from the 1st century CE. The botanical name, *Murraya koenigii*, refers to two 18th-century botanists, Johann Andreas Murray and Johann Gerhard König, rather than in tribute to the “kingly” aromatic qualities of the plant. It is grown prolifically in southern India as an ornamental and kitchen garden plant.



## Region of cultivation

Native to the foothills of the Himalayas, but spread over millennia to naturalize across India, Sri Lanka, Bangladesh, and Myanmar. It is cultivated mainly in southern India, but also across southeast Asia, in northern Australia, and in the Middle East.

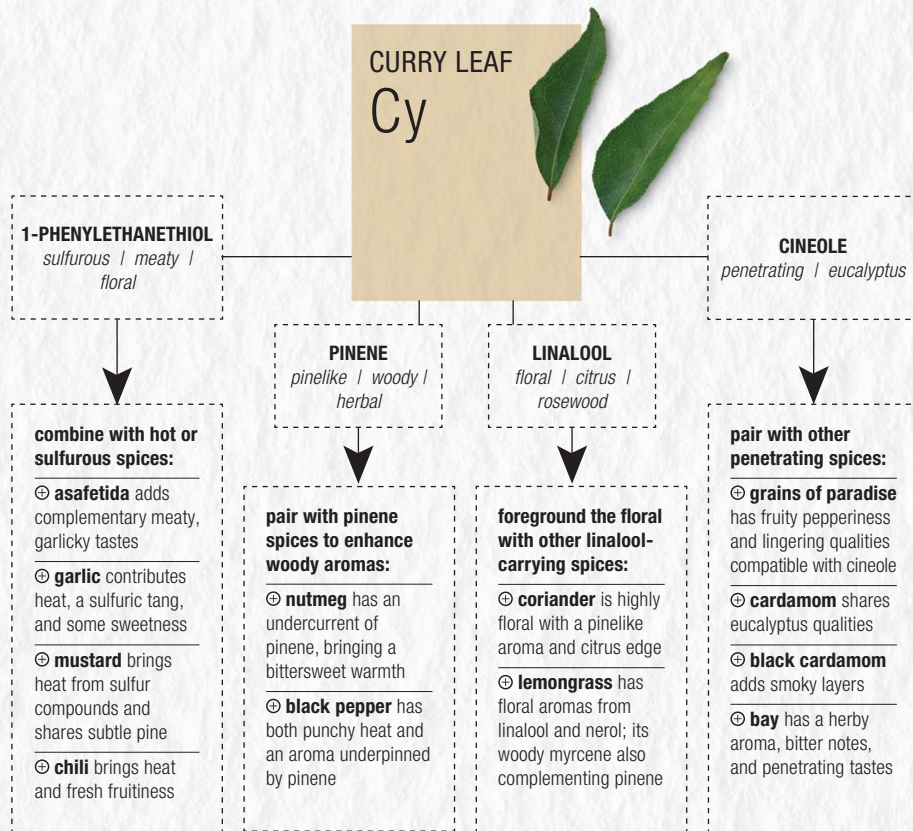


## Kitchen creativity

Picked when fresh, curry leaves have a mild, citrusy fragrance that erupts into a musky, floral aroma when bruised or sliced—not at all like curry powder!  
The flavor is subtle, so the leaves can be used liberally.

### BLENDING SCIENCE

Sulfurous compound 1-phenylethanethiol dominates the flavor, which conveys a meaty taste, hyacinth aroma, and sulfurous bite. Smaller amounts of terpenes include floral linalool, pine-scented pinene, penetrating cineole, and peppery myrcene. “Green” hexanal and limonene provide citrusy flavors, present especially in fresh leaves.



### FOOD PARTNERS

- ⊕ **Eggplant, okra** Fry fresh curry leaves with mustard seeds, cumin, and ginger before adding eggplant or okra and coconut milk, cooking until tender for a simple vegetable side dish.
- ⊕ **Lamb** Add fresh curry leaves to a garlicky yogurt marinade for lamb before slow-cooking.
- ⊕ **Seafood** Stir curry leaves into a tomato-based prawn or crab curry; swap European aromatics for curry leaves in *moules marinières*.
- ⊕ **Eggs** Fry fresh leaves in oil or ghee and drizzle over scrambled eggs.
- ⊕ **Pulses** Fry fresh leaves in ghee or butter with mustard seeds before stirring into a red lentil dhal.
- ⊕ **Baking** Add chopped leaves to flatbread dough before baking.

### BLEND TO TRY

Use and adapt this classic south Indian spice blend featuring curry leaves:  
**Gunpowder** p.45

### RELEASE THE FLAVOR

Fresh curry leaves are best plucked from the stem and lightly bruised just before adding to hot oil. If using dried leaves, they can be ground to increase flavors from this less aromatic form.



**Cook immediately** in oil or ghee to ensure all the flavorful oils can escape.



**For slow-cook** dishes, pluck out the leaves after frying and add later to ensure lighter floral notes don't entirely evaporate.



**For quick-cook** dishes, finely slice or pulverize leaves to ensure the flavor is imparted faster.



# MUSTARD

*Pungent | Earthy | Sharp*

## BOTANICAL NAMES

*Brassica alba* (white), *B. juncea* (brown),  
*B. nigra* (black)

## ALSO KNOWN AS

Indian mustard (brown mustard)

## MAJOR FLAVOR COMPOUNDS

Isothiocyanates

## PARTS USED

Seeds; leaves are also edible,  
raw or cooked.

## METHOD OF CULTIVATION

The green seed fruits (“pods”) are harvested about 4 months after sowing, when full-size but not quite ripe, so they don’t split open.

## COMMERCIAL PREPARATION

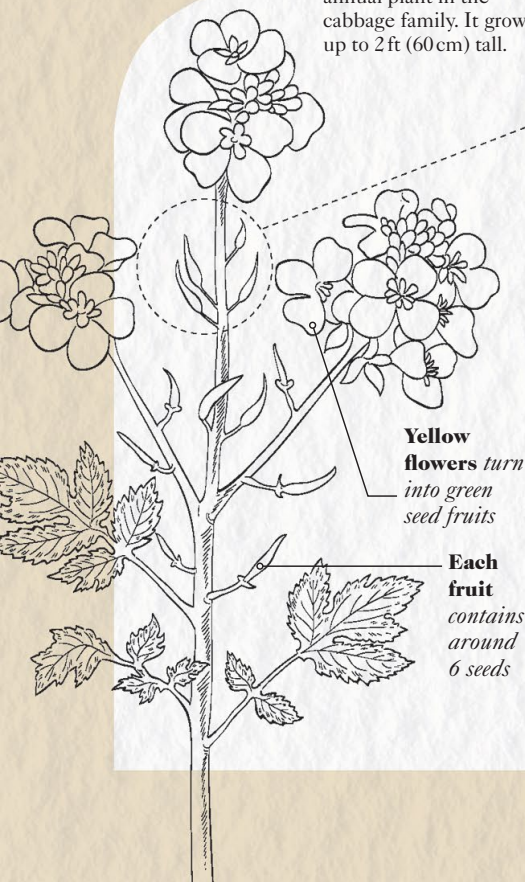
Fruits are stacked in sheaves to dry for about 10 days, then threshed and graded. Seeds for grinding will have their bitter, papery seed coats stripped off.

## NON-CULINARY USES

Mustard oil is applied topically to treat muscle aches and arthritis.

### The plant

Mustard is a fast-growing annual plant in the cabbage family. It grows up to 2 ft (60 cm) tall.



Yellow flowers turn into green seed fruits

Each fruit contains around 6 seeds

### Whole

White mustard seeds are light brown rather than white. Brown and black mustard seeds are smaller.



### Powder

Yellow mustard powder is often made from a mixture of white and brown seeds. Once moistened, flavor develops within 10 minutes, but loses its potency after an hour or so unless vinegar is added.



## Spice story

Mustard seeds have been found in prehistoric sites from China to Europe. First records of the use of mustard as a condiment date back to the ancient Greeks and Romans, who chewed the seeds whole, pulverized and sprinkled them over food, or steeped them in wine. By the Middle Ages, white mustard had made its way to India and China via the Arab trade routes, and brown mustard had traveled overland from its native India to Europe. One method of transporting the powder was to mix it with flour and other spices and form it into balls using honey, wine, or vinegar. The term mustard is thought to come from the Latin *mustum*, the name for the young wine used to mix the ground seeds to a paste.



### Region of cultivation

White mustard is probably native to the Mediterranean region. It is cultivated in most temperate regions of Europe and in North America, mainly in Canada. Brown mustard is probably native to the foothills of the Himalayas. It is cultivated throughout India.

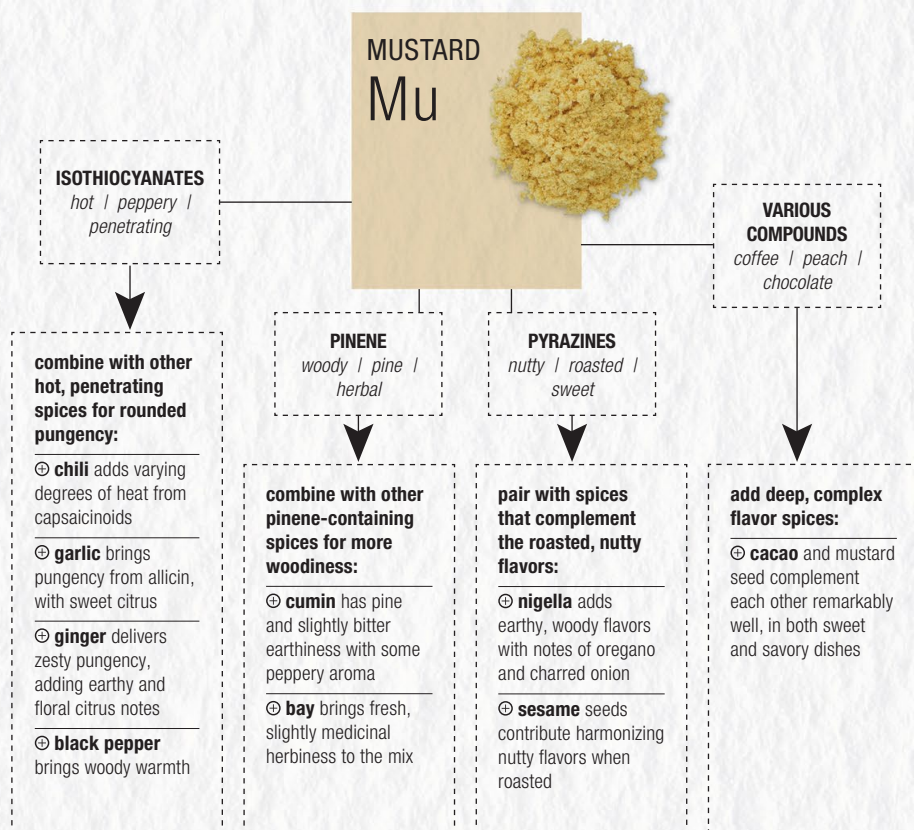


## Kitchen creativity

White mustard seeds have a mild taste and are used in pickling and to make American yellow mustard. Brown mustard seeds are much hotter, often featuring in Indian cuisine. Black seeds have a fine aroma but are less common.

### BLENDING SCIENCE

Mustard's heat is produced by sulfur-containing isothiocyanates, which, unlike other pungent compounds, vaporize at body temperature to have a nose-filling pungency. The complex flavour profile also includes pine-like pinene, ground-coffee-like furanmethanethiol, malty, peachy 3-methylbutanal, and popcorn-like 2-acetyl-1-pyrroline. Nutty, roasted pyrazine flavors are produced by toasting the seeds.



### RELEASE THE FLAVOR

Whole seeds are bland: the hot spicy isothiocyanates are only formed when a defensive enzyme called myrosinase breaks out of damaged cells to act on specific molecules – sinalbin in white mustard, stronger singrin in black and brown. However, myrosinase only functions when water is present.



Create a rich variety of nutty and roasted pyrazine flavor compounds by toasting the seeds before use.



Damage mustard seeds to release the myrosinase enzyme by crushing or cooking them.



Soak cracked mustard seeds in water for several minutes before cooking to allow the myrosinase enzyme to work and so obtain maximum flavor and heat.

### FOOD PARTNERS

- ⊕ **Parsnips** Add a spoonful of whole grain mustard to a creamy parsnip bake.
- ⊕ **Navy beans** Combine English mustard powder with molasses and add to a navy bean casserole.
- ⊕ **Rabbit** Add a spoonful of mustard to braised rabbit with tarragon.

- ⊕ **Fish** Fry brown mustard seeds in ghee with other warming spices, adding tomatoes and onion to make a sauce for fried or steamed fish.
- ⊕ **Cheese** Sprinkle mustard seeds over strips of puff pastry with grated strong cheese to make cheese straws.

### BLENDS TO TRY

Try these recipes for classic blends featuring mustard, or why not adapt them with some blending science?

- Panch phoran** p.43
- Vindaloo paste** p.44



# GRAINS OF PARADISE

*Peppery | Pungent | Fruity-floral*

## BOTANICAL NAME

*Aframomum melegueta*

## ALSO KNOWN AS

Guinea pepper, Melegueta pepper, ossame

## MAJOR FLAVOR COMPOUND

Paradol

## PARTS USED

Seeds

## METHOD OF CULTIVATION

Seed pods (fruits) are harvested when the fruit has turned from green to red.

## COMMERCIAL PREPARATION

Seed pods are typically dried in the sun. Pods are then opened and the seeds are removed for further drying.

## NON-CULINARY USES

To relieve flatulence, freshen breath, and as a stimulant. *Gerard's Herbal* states that the seeds "rid the body of infection."

## The plant

This herbaceous, perennial, reedlike plant is a member of the ginger family. It grows to a height of 5 ft (1.5 m).

Fruits are fig-shaped and contain 60–100 seeds

Seeds inside the fruits are similar in size to cardamom seeds

## Whole

Seeds are a reddish-brown color and pyramid-shaped.

The tiny seeds are milky-white inside

## Powder

Ground seeds are grayish in color.

## Spice story

Grains of paradise originated in West Africa. The spice was first brought to Europe by Arab, Berber, or Jewish merchants, via trade caravan routes across the Sahara Desert. In Europe, it reached its peak of fashionability during the 14th and 15th centuries, when merchants gave it the heavenly epithet as a marketing ploy to increase sales. It was used as a less expensive substitute for black pepper, to spice wine, beer, and as a seasoning for food. Production of the spice was so important that the area of West Africa where it was grown became known as the Grain (or Pepper) Coast. The spice's popularity in Western cuisine had dwindled by the 19th century, but in its native West Africa it remains an important spice in ritual and food; in the Nigerian Yoruba culture it is used as an offering to the spirits.



## Region of cultivation

Grains of paradise are native to the coastal regions of West Africa, where they grow in forest margins. Ghana is the main producer of the spice.

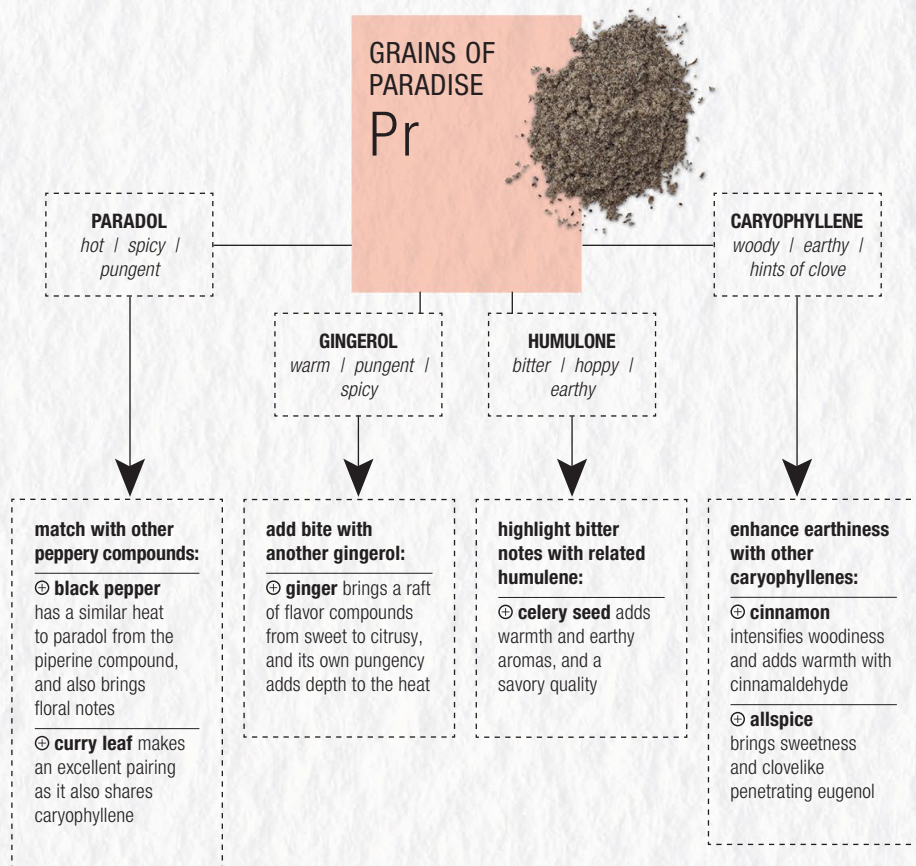


## Kitchen creativity

This spice, with its heat and fragrant, herbaceous notes, is often used in seasoning blends for meat stews and soups in North and West Africa. It can be used instead of or combined with black peppercorns—try adding a few seeds to your pepper grinder.

### BLENDING SCIENCE

The slowly developing heat of grains of paradise comes mainly from the pungent compound paradol, and to a lesser extent from gingerol, which gives heat in ginger. Bitterness derives from an acid called humulone, and fragrance from the terpene molecule caryophyllene.



### FOOD PARTNERS

- ⊕ **Vegetables** Sprinkle ground seeds over an eggplant and tomato stew; grind liberally over root vegetables after roasting.
- ⊕ **Apples** Grind a couple of seeds and add to apple compote for a citrusy, herbaceous flavor.
- ⊕ **Rice** Add plenty of ground seeds to the cooking liquid for jollof rice, a West African dish.

- ⊕ **Lamb** Toast and grind the seeds and sprinkle them over Moroccan-style stewed lamb just before serving.
- ⊕ **Oily fish** Sprinkle crushed seeds over salmon or tuna steaks before grilling.
- ⊕ **Drinks** Steep a few seeds in a warm sugar syrup with other aromatics such as pared lemon peel. Allow to cool, then use in gin or vodka cocktails.

### RELEASE THE FLAVOR

The flavor compounds in these small seeds evaporate very quickly and most dissolve poorly in water.



**Cooking with oil** is essential—most of the flavor and pungency compounds dissolve well in oil and/or alcohol.



**Grind seeds immediately** before use and add them toward the end of cooking to minimize loss of flavor from evaporation.

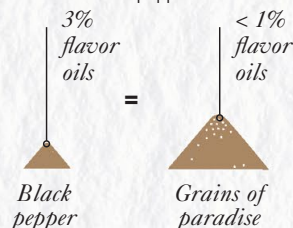
### BLEND TO TRY

Use and adapt this classic blend featuring grains of paradise.

**Mbongo mix** p.35

#### Pepper substitute

If using grains of paradise as an alternative to black pepper, add two to three times more than you would of pepper.



**Black pepper** contains three times more flavor-containing oil than grains of paradise.



# SWEET AND SPICY APPLE PASTRY ROSETTES

This beguiling take on a popular pastry treat is inspired by the sweet and peppery flavors of East and West African spiced teas. The sweetness of the apples balances the lingering heat supplied by Scotch bonnet chilis; if you can't find them, use African or Thai bird's eye chilis instead.

## SPICE IDEAS

Substitute a **different pungent spice** for the heat of chilis: try black pepper for floral woodiness, or Sichuan pepper for a tingling citrusy heat.

Experiment with the spiced tea flavors by introducing **other sweet and warming spices**, such as allspice and nutmeg.

Introduce toasted, nutty, smoky notes by **adding dried chili flakes** to the apricot jam in place of fresh Scotch bonnet chili.

*Makes 6 pastries*

*Prep time 30 mins*

*Cooking time 35–40 mins*

13 oz (375 g) sheet ready-rolled puff pastry

2 red apples, such as Empire, Jazz, or Pink Lady

juice of ½ lemon

3 tbsp apricot jam

½ Scotch bonnet chili, seeded and thinly sliced

1 tsp grated fresh ginger

½ tsp ground cinnamon

¼ tsp ground cloves

¼ tsp ground grains of paradise

¼ tsp ground cardamom seeds  
butter, for greasing

**1** Remove the puff pastry from the freezer or fridge and allow it to thaw or come to room temperature, so that it is pliable. Preheat the oven to 410°F (210°C).

**2** Cut the apples in half and remove the cores. Cut each half into ½-in (3 mm) thick, half moon-shaped slices.

**3** Put the apple slices in a saucepan with the lemon juice, cover with water, bring to a boil, and simmer gently for 2–3 minutes until the slices are just soft enough to roll up. Drain and dry the slices, then set them aside to cool. Alternatively, place the apple slices in a microwave-safe bowl with the lemon juice and 2 tablespoons of water. Cover with cling film and pierce a hole to let the steam escape. Heat for 2–3 minutes on high, until the slices are softened.

**4** Place the apricot jam with the chili and spices in a small saucepan, and heat gently until melted.

**5** On a lightly floured surface, roll out the pastry into a rectangle measuring about 12 x 14 in (30 x 36 cm). Slice the dough lengthways into six equal strips.

**6** Spread the spiced jam over each strip. Arrange the apple slices lengthways along each strip, overlapping a little, with the skin side of the slices slightly extending beyond the top edge of the strip.

**7** Fold the bottom edge of each strip up to meet the top edge. Now roll up the strips to make rose shapes, taking care to keep the apple slices in place.

**8** Grease a cupcake tin with butter and place the roses in the holes. Bake for 35–40 minutes until crisp and golden. Serve immediately.







# BLACK PEPPER

*Hot | Spicy | Citrusy*

## BOTANICAL NAME

*Piper nigrum*

## ALSO KNOWN AS

Peppercorn

## MAJOR FLAVOR COMPOUND

Piperine

## PARTS USED

Dried berries, known as “peppercorns”

## METHOD OF CULTIVATION

Berries are harvested from vines at different stages of maturity.

## COMMERCIAL PREPARATION

Underripe berries are either blanched and left to darken and dry for black pepper, or picked earlier and preserved without darkening for green pepper. Pink pepper is picked after fully ripening.

## NON-CULINARY USES

In traditional medicine as a digestive aid.

### The plant

Peppercorns come from a perennial tropical climbing vine in the pepper family.

Vines are pruned to 10–13 ft (3–4 m) in cultivation

Berries develop from whitish green flowers borne on spikes



### Whole black

Black peppercorns are dried with their browned, aromatic outer layer intact. Green pepper is less fiery and has more abundant herbaceous flavors.

### Whole white

The outer layer of white pepper is stripped by bacterial fermentation, leaving it harsher, less aromatic, and with dunglike nuances.



## Spice story

Black pepper is native to southern India and has been cultivated and traded for over 3,500 years. In the 4th century BCE, after Alexander the Great had reached India, black pepper was brought to Europe along newly established trade routes. The highly valued spice quickly became commercially important, and Arab traders established a monopoly on its transport to Europe. By the Middle Ages, black peppercorns had not only become a culinary status symbol, but were also accepted as currency. The Portuguese explorer Vasco de Gama set off to find and take control of the source of this costly spice, and discovered a sea route to southwest India in 1498. For the next century the Portuguese controlled the black pepper trade. In the 17th century they lost their monopoly to the Dutch, who lost it to Britain in the 18th century, when the British Empire took control of the spice trade in the tropics.



### Region of cultivation

Black pepper is native to the Malabar coast of southwest India. It is now cultivated mainly in Vietnam, but also in India, Indonesia, Malaysia, and Brazil.

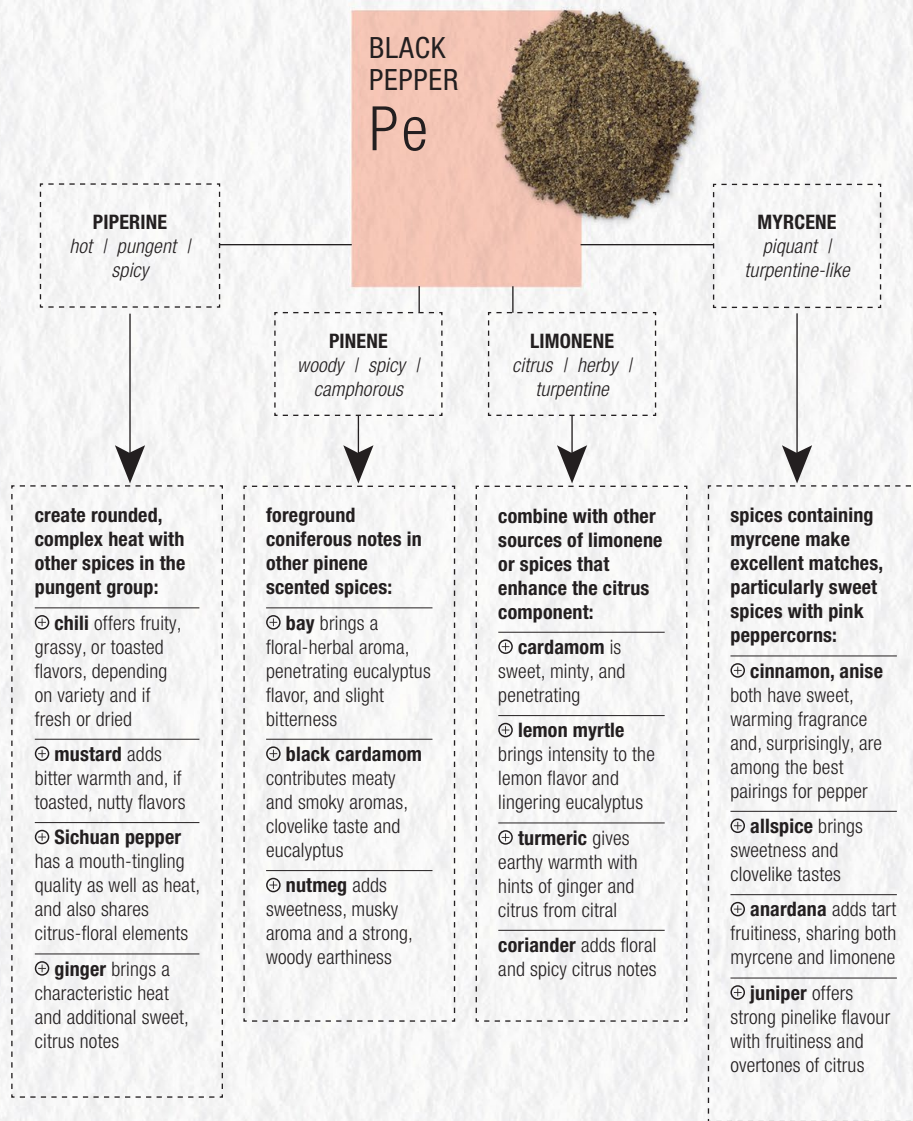


## Kitchen creativity

Black pepper produces a pungent heat that is neither flavor nor fragrance, but a painlike sensation very similar to chili heat. The spice also has a woody aroma with floral, fruity, and citrus elements, and some bitterness.

### BLENDING SCIENCE

The warming quality of pepper is produced by a pungent alkaloid called piperine. The spice's more subtle flavors are created by terpene compounds, including woody rotundone, pine-scented pinene, lemony limonene, spicy myrcene, floral linalool, and phellandrene, which has fresh lime and green notes.



### FOOD PARTNERS

- ⊕ **Preserved vegetables** Add whole black or green peppercorns to a brine for preserving roasted bell peppers or fresh cucumber.
- ⊕ **Fruit** Sprinkle ground pepper over peaches or melon, or macerate strawberries with sugar and a few grinds of black pepper.
- ⊕ **Steak** Swap black pepper for dried or pickled green peppercorns for a fruitier bite to *steak au poivre*.
- ⊕ **Shellfish** Add white pepper to a clam chowder or *moules marinières*.
- ⊕ **Ice cream** Grind black pepper into vanilla custard before churning to make ice cream.

### RELEASE THE FLAVOR

To enjoy pepper's full complexity it is vital to preserve subtle terpene compounds, which quickly break down and evaporate when exposed to air.



**Grind** whole peppercorns immediately before use to minimize flavor loss.



**Pre-ground** spice is only good for adding heat.

### BLENDS TO TRY

Use and adapt these classic blends featuring black pepper:

**Turkish baharat** p.23

**Chaat masala** p.42

**Nanjing spice bag** p.59

**Quatre épices** p.74



# SICHUAN PEPPER

*Pungent | Citrusy | Floral*

## BOTANICAL NAME

*Zanthoxylum simulans*

## ALSO KNOWN AS

Chinese coriander, Chinese pepper, mountain pepper, *fagara*

## MAJOR FLAVOR COMPOUNDS

Sanshools

## PARTS USED

Fruits, leaves

## METHOD OF CULTIVATION

Fruits are picked in autumn when they are mature and the leaves begin to redden.

## COMMERCIAL PREPARATION

The fruits are sun-dried until they split open. The bitter seeds are discarded, and then the fruits are dried further.

## NON-CULINARY USES

Used in Chinese herbal medicine as a stimulant to promote digestion. Also used as a diuretic and to treat rheumatism.

### The plant

Sichuan pepper comes from a shrub or small tree in the citrus family.

Fruits are small and rust-red

Leaves are used as a spice in Japan

Seeds are black and shiny

Seeds are slightly bitter but harmless, and need not be discarded

Surface is prickly, with bits of stalk attached

### Whole

The spice flavor comes from the fruit's dried husk, rather than from the black seeds inside it.

### Powder

Ground Sichuan pepper is available to buy, but is best avoided as the flavors quickly degrade.

## Spice story

Sichuan pepper has long featured in the culture and cuisine of China. More than 2,000 years ago, during the Han Dynasty, it was reportedly mixed into plaster to perfume the walls of “pepper houses”—buildings that housed the Emperor’s concubines—to warm the rooms and perfume the air. It has also been found in tombs in northern China dating back to a similar period. The pepper was used to spice luxury foods and wines; Hanshan, an 8th century Chinese poet, described lavish dishes of “roast duck tintured with Sichuan pepper and salt.” It was also key in foods prepared as offerings to the gods. Perhaps because the plant bears many fruits and seeds, it was adopted as a fertility symbol, and in some rural areas of China the spice is still thrown over newlyweds, like rice or confetti.



### Region of cultivation

Sichuan pepper is native to the Sichuan region of China. It is now cultivated throughout China, Korea, Mongolia, Nepal, and Bhutan.

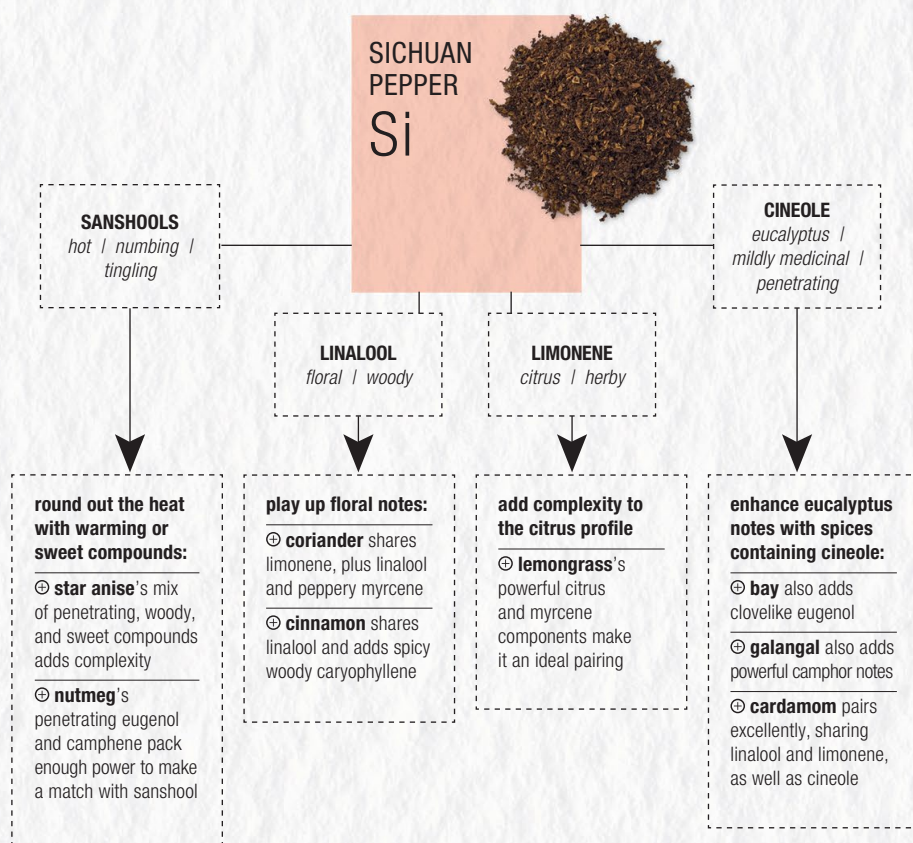


## Kitchen creativity

Sichuan pepper is an essential ingredient in Chinese cooking. It comprises two of the five key flavors of Chinese food, namely hot (or pungent) and bitter (or numbing), the others being salt, sweet, and sour.

### BLENDING SCIENCE

Sichuan pepper contains a group of compounds called sanshools, which act on nerves in the mouth and lips to cause numbing, tingling sensations. Fragrance is added by a combination of flavor compounds: linalool, geraniol, limonene, and terpineol. Its sharp qualities come from myrcene and cineole.



### FOOD PARTNERS

- ⊕ **Vegetables** Fry crushed pepper in oil before using it to stir-fry green beans, asparagus, or cabbage. Sprinkle with ground, toasted pepper.
- ⊕ **Citrus** Sprinkle toasted, crushed pepper over a tart blood-orange sherbet or lemon sorbet.
- ⊕ **Pork, beef** Add whole to slow-cooked pork belly or oxtail with ginger, spring onions, star anise, sugar, and soy.
- ⊕ **Squid** Add crushed pepper to the batter for deep-fried squid.
- ⊕ **Noodles** Combine cold cooked noodles, roasted peanuts, spring onions, stir-fried greens, and chili, then drizzle with a pepper- and sesame-infused oil.

### RELEASE THE FLAVOR

The thick husks of the peppercorns can impede the release of flavors. Toasting helps the compounds to escape. They can also be ground in a pepper mill and used as a condiment.

*Toasting also develops nutty pyrazines*



**Avoid over-roasting**, which can cause the loss of the limonene molecules and mask subtler scents with strong pyrazines.

### Zanthoxylum variations

There are regional variants of Sichuan pepper, which come from slightly different tree species. They have the same core features but can have significantly different flavor profiles.

**Sanshō**  
(*Zanthoxylum piperatum*) is the milder version from Japan, with pronounced citrus flavors.

**Timur**  
(*Zanthoxylum alatum*) comes from Nepal and has distinctly grapefruit notes.

**Andaliman**  
(*Zanthoxylum acanthopodium*) is from Indonesia and has notes of lime and mandarin.

**Tirphal**  
(*Zanthoxylum rhetsa*) is grown in the coastal rainforests of India and has a lingering bitterness.

### BLENDS TO TRY

Use and adapt these classic blends featuring Sichuan pepper:

**Timur ko chhop** p.41

**Shichimi-togarashi** p.57



# GINGER

*Hot | Citrusy | Woody*

**BOTANICAL NAME**

*Zingiber officinale*

**ALSO KNOWN AS**

Ginger root, Canton ginger

**MAJOR FLAVOR COMPOUNDS**

Gingerol, shogaol, and zingiberene

**PARTS USED**

Rhizomes (fleshy underground stems)

**METHOD OF CULTIVATION**

Rhizomes are harvested 2–5 or 8–10 months after planting if they are to be sold fresh, or are to be dried, respectively.

**COMMERCIAL PREPARATION**

*Fresh:* Young rhizomes are cleaned, sometimes bleached, and dried for a day or two. *Dried:* Mature rhizomes are peeled, dried, and ground.

**NON-CULINARY USES**

Perfumery and cosmetics; in traditional medicine for indigestion and nausea.

**The plant**

Ginger is a tropical, rhizomatous flowering plant, in the same family as turmeric and cardamom. It grows up to 3 ft (1 m) tall.

**Flowers** consist of cone-shaped clusters of yellowish bracts.

**Shoots** are a series of tightly overlapping leaf bases

**Powder**

Do not use ground dried ginger in place of the fresh spice, as it has a different flavor profile (see Dry heat, opposite).


**Fresh**

Avoid older rhizomes with signs of shriveling, which can mean the flesh is fibrous.

## Spice story

Ginger was one of the first Asian spices to reach Europe, from around the 4th century BCE, when Arab traders transported dried and preserved ginger to ancient Greece and Rome. The Greeks prescribed it for stomach complaints, and the Romans used it in sauces and to make aromatic salt. By the 9th century CE, dried ginger was regarded as an everyday condiment in Europe. By the Middle Ages it was being widely used in savory and sweet cooking (notably gingerbread), and for flavoring beer and ale. By the 13th century, ginger was being grown in East and West Africa, and by the 16th century it was being cultivated in Jamaica, which still has a reputation for producing quality ginger.


**Region of cultivation**

Ginger is native to tropical Asia, possibly India. Today it is mainly cultivated on India's Malabar Coast (which produces 50 percent of the world's fresh crop) and throughout tropical and subtropical Asia, but also in parts of Africa, Jamaica, Mexico, North America, and Peru.

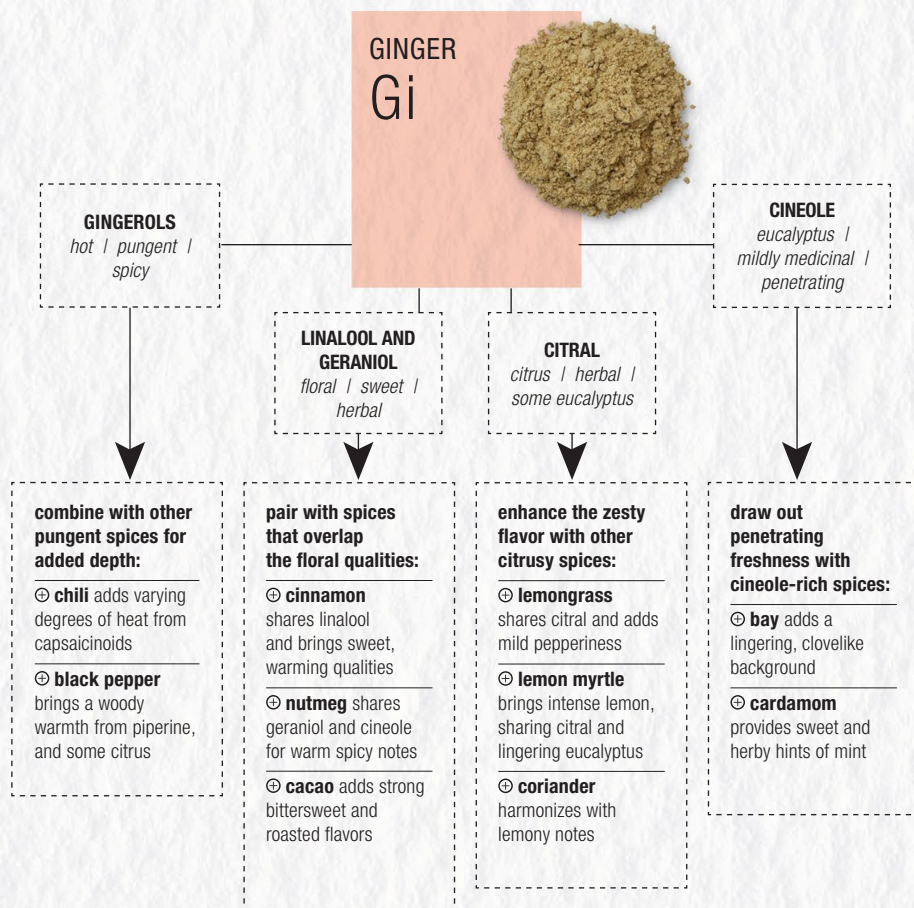


## Kitchen creativity

Ginger has a hot-spice, citrusy, woody taste. The dried form has a stronger, more aromatic flavor than fresh ginger, and is commonly used in baking and in spice blends. Fresh ginger is widely used in Asian cuisine.

### BLENDING SCIENCE

The terpene compound zingiberene carries the characteristic aroma of ginger, but the taste is made more complex thanks to a cornucopia of other compounds, including spicy-hot gingerols, as well as floral linalool and geraniol, herbal curcuminene, lemony citral, and eucalyptus-like cineole.



### FOOD PARTNERS

- ⊕ **Squash and coleslaw** Mix grated fresh ginger into Asian-style coleslaws, or fry with the onion base of a squash soup.
- ⊕ **Mango, pears, rhubarb** Pair with mango in creamy puddings, and poach fresh slices with pears and rhubarb.
- ⊕ **Pork** Add slices of fresh ginger to slow-cooked pork dishes to offset the fattiness.
- ⊕ **Fish** Use julienned ginger with shredded leek or spring onions when steaming fish.
- ⊕ **Baking** Try adding ground ginger to carrot cake, lemon cake, and coconut or dark chocolate cookies.

### BLENDS TO TRY

Use and adapt these classic blends featuring ginger.

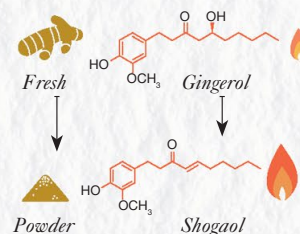
*Advieh* p.27

*Yaji* p.36

*Leche de tigre* p.69

#### Dry heat

When fresh ginger is dried, its heat pungency increases and a fifth of the flavor molecules evaporate.



The drying process converts gingerol to shogaol, which has twice the heat. The dry spice also has fewer citrus notes.

### RELEASE THE FLAVOR

Peel fresh ginger shortly before use in order to retain the complex flavor profile. Heat breaks both gingerols and shogaols into mild zingerone, so the longer that ginger is cooked, the gentler its spicy-heat.



**Stripping the skin** bursts open the outer layer of cells, allowing fragrant oils to evaporate.



**Cooking** converts ginger's mouthwarming flavor compounds into the much milder zingerone.



# CHILI

*Hot | Pungent | Fruity*

## BOTANICAL NAME

*Capsicum annum*, *C. frutescens*, and several other species

## ALSO KNOWN AS

Chili pepper, chile, red pepper, hot pepper

## MAJOR FLAVOR COMPOUND

Capsaicin

## PARTS USED

Fruits (which are in fact berries)

## METHOD OF CULTIVATION

Green chilis are harvested unripe, about 3 months after planting. Chilis for dry spice are usually harvested when red and fully ripe.

## COMMERCIAL PREPARATION

Chilis are washed and either sun- or oven-dried, pickled, or sold fresh.

## NON-CULINARY USES

In creams and ointments to reduce muscle pain; in Ayurvedic medicine to stimulate digestion.

### The plant

Chilis are borne by annual or perennial plants in the nightshade family. Around 32 species are cultivated for their fruits.

### Powder

Grinding causes many flavor compounds to evaporate, and powders are best used for adding heat.



### Whole dried

Some fragrant substances are lost through the drying process, but new compounds are created, ranging from sweet aniselike flavors to nutty, woody, and roasted nuances.



### Fresh

Fruity, citrus, green flavors and sweetness are often prominent in fresh chilis, depending on type and ripeness.



Unripe fruits are green; ripe fruits range from yellow to almost black

## Spice story

Evidence suggests chilis were being cultivated as early as 5000 BCE in South America. According to the Spanish conquistador Hernan Cortez, the ancient Aztecs cultivated a vast range of chilis for use in rituals and adding to chocolate beverages. Columbus brought the newly discovered spice back to Spain at the end of the 15th century CE; he wrongly assumed chilis were related to peppercorns because of their heat and the name has stuck. Portuguese traders transported the spice to their colony in Goa, India, and to Asian and African trading posts, where chilis rapidly replaced black pepper as the hot spice of choice. In 1912, the pharmacologist William Scoville devised a way of measuring chili pungency, which became known as the Scoville Heat Index, but this is now being replaced by more accurate lab-based measures.



### Region of cultivation

Chilis are native to Mexico and Central and South America. Production of the dried spice is concentrated in China, South Asia, mainland Southeast Asia, Egypt, Ethiopia, Turkey, and Romania. Indonesia, North Africa, Spain, Mexico, and the US are more noted for growing fresh chilis.

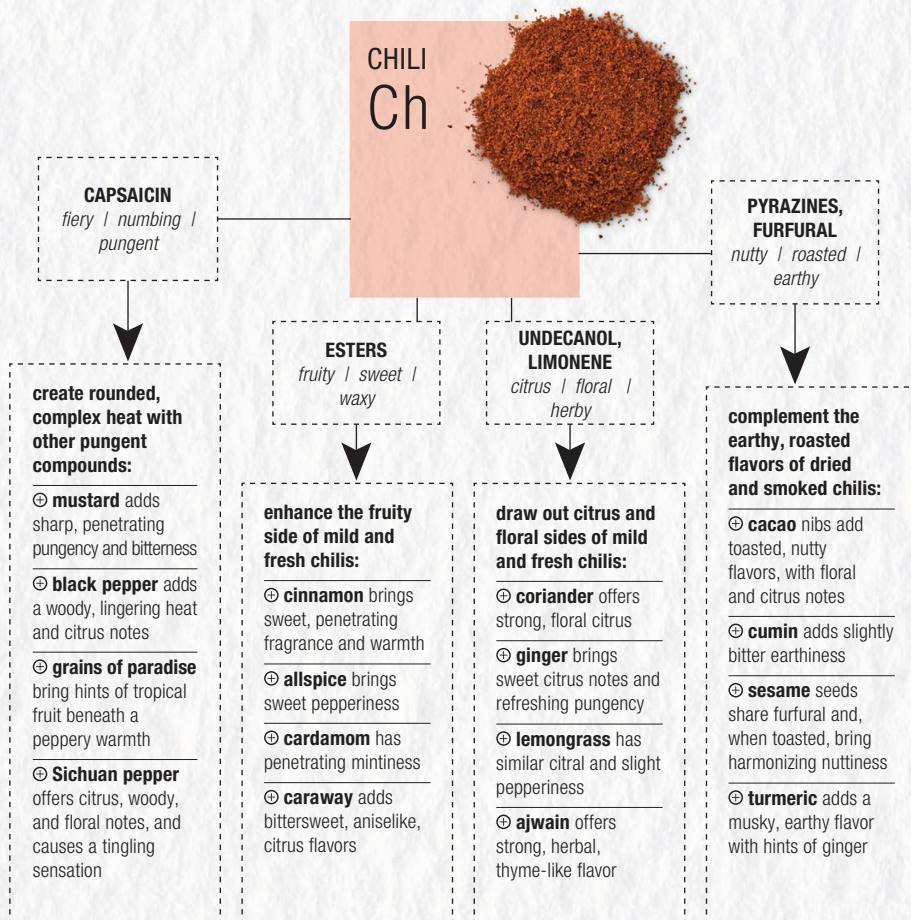


## Kitchen creativity

Chilis appear in countless cuisines across the world and are used as much for their flavor as for their heat, particularly in Mexican cooking. Some powders are actually spice blends; “chile” powder and cayenne pepper are generally pure.

### BLENDING SCIENCE

Capsaicin is responsible for the heat pungency that can numb the mouth to more subtle flavors. The latter are best appreciated in milder and/or fresh chilis and are produced by plentiful fruity esters, and less common floral undecanol, grassy aldehydes, and citrusy limonene. Drying and smoking chilis creates new flavor compounds, notably earthy, toasty pyrazines and nutty, breadlike furfural.



### FOOD PARTNERS

- ⊕ **Tropical fruit** Dust chili powder over sliced tropical fruit.
- ⊕ **Tomatoes** Sprinkle smoked chili flakes over chilled gazpacho.
- ⊕ **White fish** Blend soaked, dried chilis and add them to a cherry tomato sauce for grilled or fried white fish.
- ⊕ **Chicken, tofu** Combine dried red chili and Sichuan pepper in a fragrant chicken stir-fry, or substitute tofu.
- ⊕ **Cheese** Mix small amounts of ground chili into dark chocolate desserts, tarts, cookies, or ganache.

### BLENDS TO TRY

Try these blends featuring chili and adapt them with blending science:

**Harissa** p.33

**Yaji** p.36

**Timur ko chhop** p.41

**Vindaloo paste** p.44

**Gunpowder** p.45

**Shichimi-togarashi** p.57

**Chili black bean sauce** p.61

**Mole mix** p.65

**BBQ rub** p.68

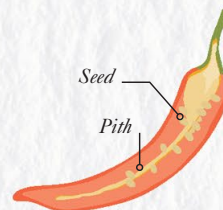
**Arrabiata sauce** p.76

### CONTROL THE HEAT

Don't underestimate chili heat: add with caution! Less fat in a dish will curb heat as capsaicin dissolves in oil, though some related capsaicinoids do dissolve in water.



**Dried chilis** have more heat than their fresh equivalent: capsaicin concentration roughly doubles after drying.



**Remove the inner** white pith (or placenta) to reduce heat. “Seeding” is effective only if the pith is removed in the process.



## CHILI *varieties*

Chilis come in many shapes, sizes, and colors. As a rule of thumb, the smaller and riper a chili is, the hotter it will be. Mexico is unique in having distinct uses for their many chili varieties. Mexican dried chilis should be pliable, not brittle. Wipe them clean, remove the stems and bland seeds, dry-roast, then soak before use.

### FRESH CHILIS



**Pith** tends to fill the interior of jalapeños

#### **Jalapeño**

Medium-hot jalapeño chilis are harvested green for using fresh, roasting, or pickling, or left to ripen further for smoke-drying. In Mexico, *jalapeño* refers to pickled chilis; fresh they are known as *cuarescmeno*.

### DRIED CHILIS



**Use crumbled** or ground in cornbread or pork stews

#### **Guajillo**

This is the dark, sun-dried form of the *mirasol* chili. Its smoky sweetness—with just a little heat—peps up classic Mexican tamales, enchiladas, and salsas.



**Medium heat** variety with a smoky, nutty taste

#### **Cascabel**

This cherry tomato-shaped Mexican chili—nicknamed the “rattle chili” because its seeds rattle when shaken—is prized for its tropical sweetness without excessive heat.



**Dried version** of the Mexican poblano pepper

#### **Ancho**

A sweet, fruity, and mild dried chili, with a hint of tobacco, it can be soaked and stuffed, or blended and added to *mole* sauce. Goes well with pulled pork in a burrito.



#### **Arbol**

This slender, sun-dried chili is widely used in Mexican cuisine to add a bright, fiery flavor with smoky notes. Fry in oil and finely chop, or crush and use as chili flakes.

#### **Kashmiri**

The dried Kashmiri chili has an attractive deep crimson color, and unlike many Indian chilis it is only mildly spicy. An essential part of rogan josh and Kashmiri biryani.





Ripe color ranges from yellow to orange-red

**Scotch bonnet**

Related to the habanero, Scotch bonnet is also extremely hot—it is known in Guiana as “ball of fire”—and has a deep, fruity flavor. It is the preferred chili of the Caribbean.

Also known as Thai chilis



**Bird's eye**

Available fresh or dried, this fiery chili is ubiquitous in Asian cooking, especially in the soups, salads, and sambals of southeast Asia and in Chinese stir-fries.

**GROUND CHILIS**



**Smoked chipotle**

Chipotle is the name given to smoke-dried ripe jalapeños. In addition to smokiness, they have a chocolate-like sweetness. Use ground for fast intensity or whole in slow-cook stews.



**Cayenne**

The clean, sharp heat of cayenne pepper is typically enjoyed dried and ground. It is an important ingredient in Indian and South American cuisine.



**Espelette**

A legally-protected variety only cultivated in the commune of Espelette in France, it has a citrusy flavor and medium heat. Used in Basque cuisine in meat cures, piperade, and fish stew.



Meaty texture and pliable flesh

**Mulato**

Closely related to *ancho*, the *mulato* chili has a smokier taste. Seeded, toasted, soaked, and ground into a paste, it adds intense ripe fruit flavors and a rich, dark color.

Resembles a mini bell pepper but is one of the hottest chilis



**Habanero**

Bright orange with an intensely fruity aroma, habaneros are an essential part of *cochinita pibil*, a slow-cooked pork dish from Mexico's Yucatán peninsula.

Used in African cuisine to spice meat dishes



Also known as “little raisin”

**Pasilla**

This Mexican staple spice is medium-hot, with a complex, sweet flavor resembling licorice. Works well in sweet recipes, such as chocolate cake.



**Piri piri**

The tiny piri piri chili (also known as African bird's eye) is milder than the true bird's eye but still intensely spicy. Essential to *molho de piri-piri*, a Portuguese sauce.



# SAFFRON

*Grassy | Bitter | Honeyed*

## BOTANICAL NAME

*Crocus sativus*

## ALSO KNOWN AS

Red gold

## MAJOR FLAVOR COMPOUND

Picrocrocin

## PARTS USED

Flower stigmas (female pollen-catching reproductive parts)

## METHOD OF CULTIVATION

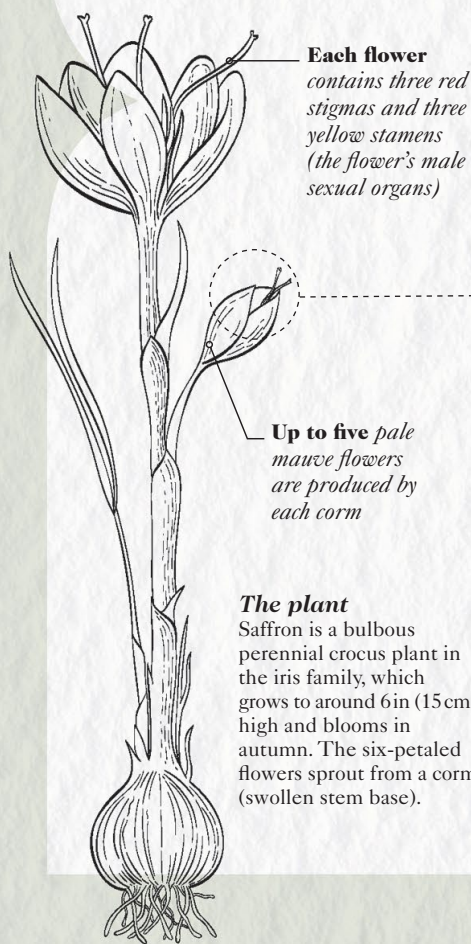
Harvesting takes place over two weeks in late autumn. Flowers are hand-picked pre-dawn, before they open for the day.

## COMMERCIAL PREPARATION

The stigmas are laid out on a sieve, dried, and then transferred to airtight tins.

## NON-CULINARY USES

Cosmetic coloring agent and fabric dye; in Ayurvedic medicine as a sedative and to treat coughs and asthma.



Each flower contains three red stigmas and three yellow stamens (the flower's male sexual organs)

Up to five pale mauve flowers are produced by each corm

### The plant

Saffron is a bulbous perennial crocus plant in the iris family, which grows to around 6 in (15 cm) high and blooms in autumn. The six-petaled flowers sprout from a corm (swollen stem base).

Look for vibrant red strands—duller red-brown or pale stigmas may be stale



Strands readily absorb moisture from the air, so keep dry in a sealed container

### Whole strands

More than 6,000 flowers and over 12 hours labor makes just 1 oz (30 g) of saffron, so if it's cheap, be suspicious. Imitation saffron is often odorless and may taste sweet, rather than bitter. Ground saffron is easily adulterated and best avoided.

## Spice story

Grown since the Early Bronze Age, saffron has been prized for millennia. Cleopatra is said to have bathed in saffron-scented mare's milk, China's Buddhist monks used it to color their robes, and it was adored by Greeks, Romans, and Indian emperors as food and medicine. As trade routes opened up in medieval times, Arabs took it to Spain and Crusaders to France and England. Britain cultivated it in the Middle Ages, and the Essex town of Saffron Walden is named after the spice that grew there. Owing to its value, saffron has been adulterated for as long as it has been traded, and imitations (turmeric, marigold petals, and safflower) are rife even today. Kashmiri saffron is particularly prized, as is saffron from La Mancha in Spain, which has been granted EU Protected Designation of Origin (PDO) status. Saffron's modern name derives from the Arabic for yellow: *asfar*.



### Region of cultivation

Native to parts of the Mediterranean and originally cultivated in Greece, saffron is now mainly grown in Iran, which accounts for 90 percent of world production, as well as Kashmir, Spain, Greece, Afghanistan, and Morocco.

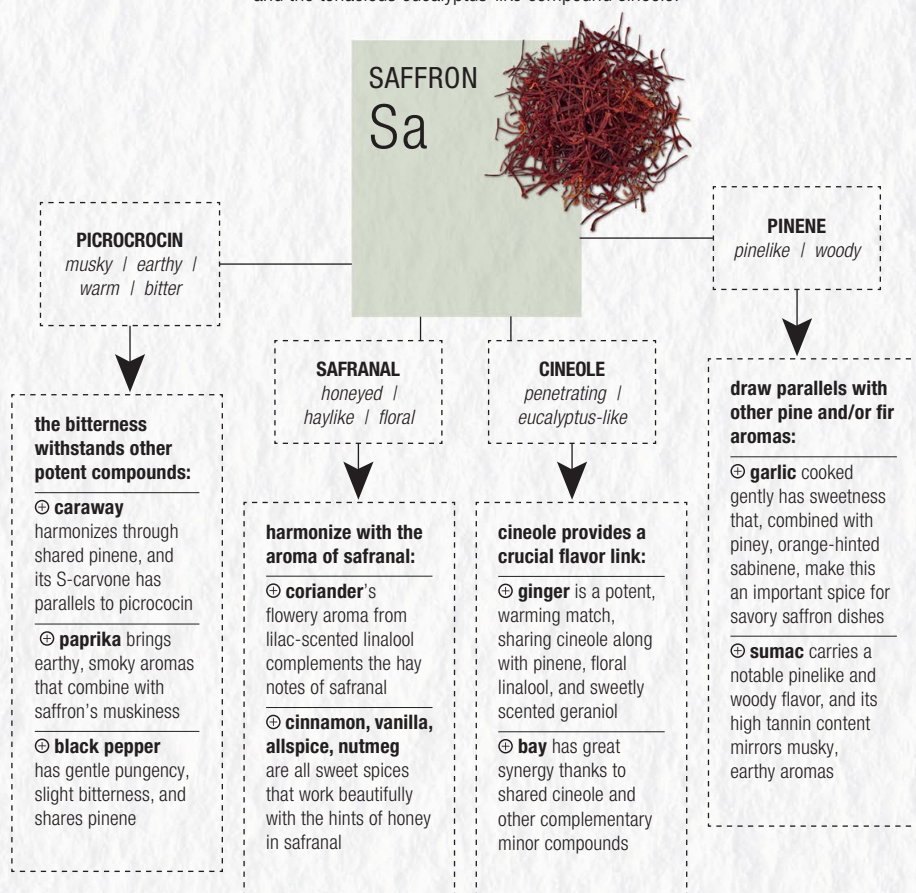


## Kitchen creativity

Warm, musky, with the distinctive aroma of cut hay and a slightly metallic tang, saffron's flavor comes in part from compounds unique among the spices. With correct handling, just a pinch will transform a meal.

### BLENDING SCIENCE

Picrocrocin gives saffron its lingering, slightly bitter taste, and safranal produces much of its distinctive aroma. Both picrocrocin and safranal are unique to saffron, but their qualities help to determine pairings, as do the small amounts of pinene and the tenacious eucalyptus-like compound cineole.



### FOOD PARTNERS

- ⊕ **Vegetables** Saffron has a particular affinity to earthy vegetables, such as carrots, leeks, mushrooms, squash, and spinach. For rich color and depth of flavor to roasted potatoes, parboil in saffron-infused water then roast with oil mixed with ground saffron.
- ⊕ **Lemon** Pair saffron and preserved lemon in a Moroccan-style tagine.
- ⊕ **Rice** Essential to Spanish paellas, saffron also enriches Iranian pilaus, Indian biryani, and Italian risotto.
- ⊕ **Lamb** Use to flavor a yogurt marinade for slow-roasted leg of lamb.
- ⊕ **Fish, shellfish** Poach fish in saffron-infused milk, or add steeped strands to a crab or lobster bisque, *moules marinières*, or Marseille bouillabaisse.
- ⊕ **Milk** Infuse into milk to make Indian custardlike puddings, ice cream, or reduced-milk candy.

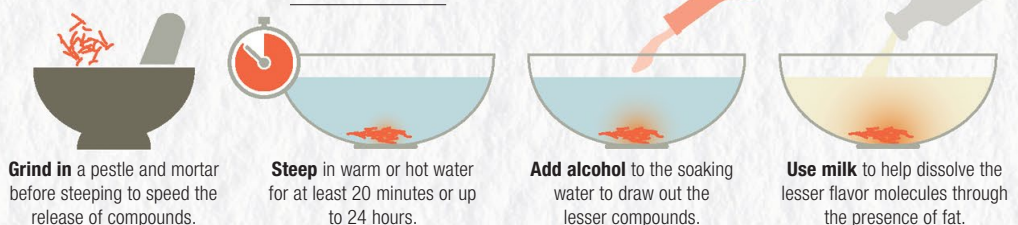
### BLEND TO TRY

Use and adapt this classic blend featuring saffron:

**Paella mix** p.75

### RELEASE THE FLAVOR

The key flavor compounds (safranal and picrocrocin) and pigments (crocin) dissolve in water better than in oil, but need time to escape and benefit from steeping; adding directly may leave much still trapped in the threads.





# SPICED SCALLOPS WITH SAFFRON BEURRE BLANC

Kashmiri cooking is often characterized by the contrast of warm roasted fennel seeds, astringent ginger, and sweet saffron. This trio that travels well across global cooking styles, and is a great match for mushrooms and seafood—both feature in this indulgent dish of scallops in a vibrant take on French butter sauce.

## SPICE IDEAS

Make a more **earthy, South Indian-style** spice seasoning by replacing the fennel and ginger with curry leaves and mustard and cumin seeds.

Use a **Mediterranean spice palette** and pair fennel seeds with cumin and hot paprika—smoked if you prefer—instead of ginger.

For **stronger pepper notes**, lightly crack the whole peppercorns, to release more flavor oils, before adding to the *beurre blanc*.

*Serves 6 as an appetizer*

*Prep time 30 mins, plus  
1 hour soaking*

*Cooking time 2 hours 25  
mins, plus cooling*

### For the mushroom and spice seasoning

7 oz (200 g) button mushrooms  
2 tsp fennel seeds  
1 tsp ground ginger  
1 tsp salt

### For the *beurre blanc*

small pinch saffron strands  
3 tbsp white wine vinegar  
4 tbsp white wine  
1 shallot, finely diced  
6 black peppercorns  
¾ cup (175 g) unsalted butter, cubed  
½ lemon

### For the scallops

12 large scallops, roe removed  
2 tbsp extra virgin olive oil  
4 tbsp mushroom and spice mix  
2 tbsp chives, snipped

- 1 Grind the saffron strands to a powder using a pestle and mortar, and leave to soak in 2 tablespoons of warm water for 1 hour.
- 2 For the spiced mushroom seasoning, heat the oven to 250°F (120°C). Thinly slice the mushrooms and spread out in a single layer on a baking tray lined with baking parchment. Bake for 2 hours, or until the mushrooms are crisp. Remove from the oven and leave to cool.
- 3 Heat a small frying pan over medium heat and toast the fennel seeds for 1 minute, until fragrant. Grind the toasted seeds to a powder.
- 4 Put the mushrooms in a small food processor and add the fennel, ginger, and salt. Process until coarsely ground, and set aside. The mix will keep for 2–3 weeks in a tightly lidded jar.
- 5 For the *beurre blanc*, pour the vinegar and wine into a small pan and add the diced shallot and peppercorns. Bring to a boil, and then simmer for 4–6 minutes, until it has reduced to 1–2 tablespoons and looks syrupy.
- 6 Strain the liquid and discard the shallots. Whisk in the saffron and its soaking water. Return the liquid to the rinsed-out pan and cook for about 15 minutes over a low heat, whisking in the butter gradually, one cube at a time. The sauce will emulsify and thicken so that it just coats the back of a spoon. Season and sharpen the sauce with a squeeze of lemon, and keep it warm.
- 7 Heat a dry frying pan over medium heat. Brush both sides of each scallop with olive oil and lightly coat with the spiced mushroom mix. Cook the scallops for 1–2 minutes on each side, depending on their size. Take care not to overcook—they are ready when they are opaque but still tender.
- 8 Divide the *beurre blanc* between six shallow bowls and top each with two scallops. Sprinkle with the chives and serve immediately.







# POPPY

*Nutty | Mild | Green*

**BOTANICAL NAME**

*Papaver somniferum*

**ALSO KNOWN AS**

Opium poppy, maw seed

**MAJOR FLAVOR COMPOUND**

2-Pentylfuran

**PARTS USED**

Seeds

**METHOD OF CULTIVATION**

Seed pods are harvested mechanically in the fall when the petals fade and the seed heads turn from green to yellow-brown.

**COMMERCIAL PREPARATION**

The pods are dried, then cracked open to collect the seeds.

**NON-CULINARY USES**

Poppy seed oil is used in the cosmetics industry. Several painkillers and sedatives are manufactured from the plant's unripe seed pods.

**The plant**

Opium poppy is a summer-flowering annual herbaceous plant that can grow to 4 ft (1.2 m) high.

**Ripe pods** make a rattling sound when shaken

**Seed pods** have a ribbed outer shell containing several chambers holding hundreds of tiny seeds

**Leaves** can be cooked and eaten like spinach

**Seeds** appear round at first glance, but are in fact kidney-shaped

**Black**

The blue-black variety of seeds is the most widely cultivated. The hard raw seeds have a mild taste and almost no aroma.

**1 gram** contains about 3,300 tiny seeds

**White**

The pale variety of seeds is popular in Indian cooking and is most often ground to add richness and as a thickener for sauces.



## Spice story

Poppy seeds were cultivated as early as 3500 BCE by the Sumerians of modern-day southern Iraq, and later, in around 2000 BCE, the Hittites of Anatolia used them in bread making. In a first-century novel by Petronius, a wealthy Roman serves dormice at his banquet, glazed in honey and rolled in poppy seeds. Through Arab traders, poppy cultivation spread along the Silk Road from Arabia and Persia to India and China. Although its use declined after the fall of the Roman Empire, the spice regained popularity in Europe in the Middle Ages. The botanical name “somniferum” translates as “sleep bearing,” and refers to the use of the plant to produce the drug opium. However, opium is made from the “sap” of unripe seed pods rather than from the ripe seeds used for cooking, which do not have the same effect.


**Region of cultivation**

Native to the western Mediterranean and southwest Asia, poppy is cultivated in the Netherlands, France, the Czech Republic, Turkey, Iran, India, China, and Canada.

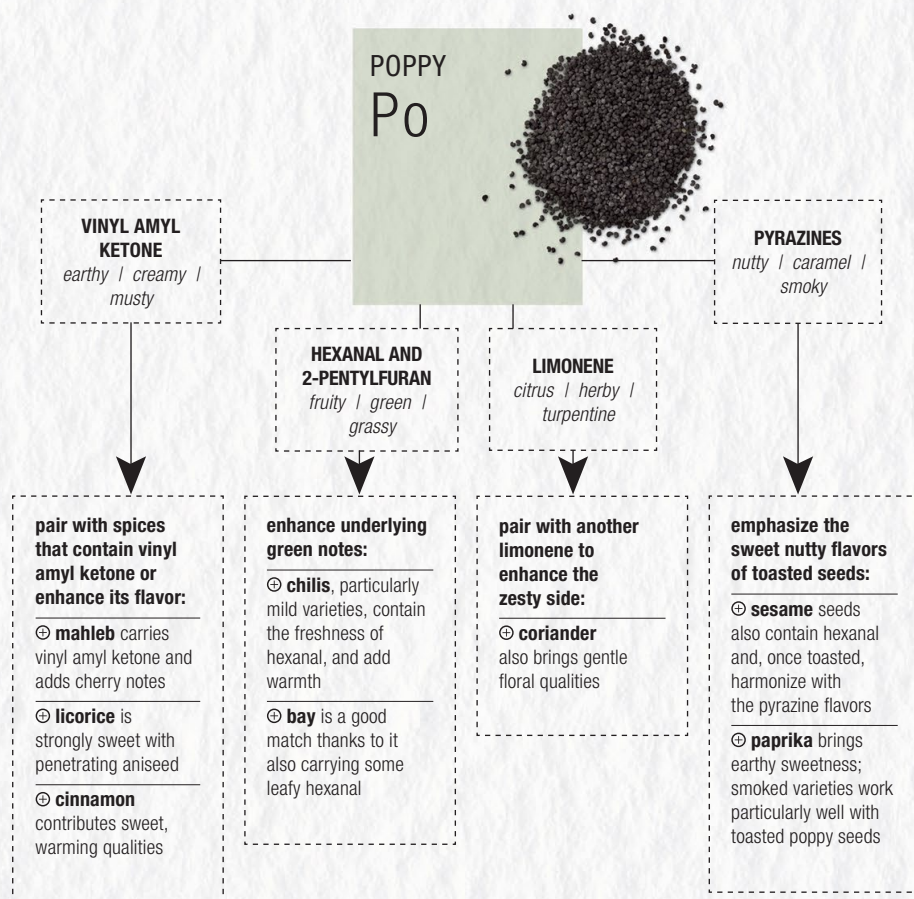


## Kitchen creativity

Poppy seeds lend themselves to a variety of dishes, from pickles and kormas to cakes, bagels, and buns. The blue-gray seeds are used in central and eastern European and Middle Eastern cuisines, and the creamy-yellow seeds are used in Asian cooking.

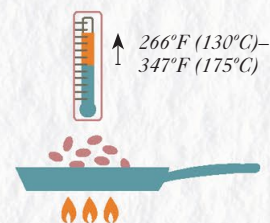
### BLENDING SCIENCE

Poppy seeds are rich in linoleic acid, which makes the taste buds more sensitive to sweet, salty, and savory tastes, while dampening down bitterness. The seeds are also packed with green and grassy aldehyde flavour compounds, in particular 2-pentylfuran and hexanal. Other important flavor compounds include balsamic vinyl amyl ketone, and citrusy limonene.

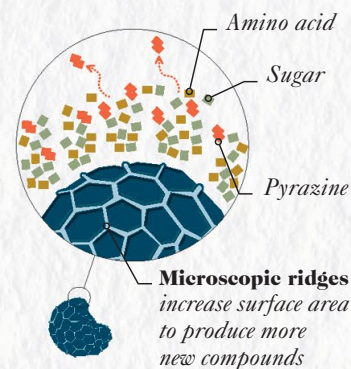


### RELEASE THE FLAVOR

Poppy seeds contain a particularly diverse range of amino acids, which means that, when toasted, they produce a remarkable mix of sweet, earthy, nutty, onionlike, and smoky flavors.



**Temperatures** over 266°F (130°C) are needed to create new compounds, but burned, bitter flavors will predominate over 347°F (175°C), due to the small seed size and fragile oils.



**When heated**, amino acids and sugars in the seeds react with each other to produce new flavor compounds, most importantly pyrazines.

### FOOD PARTNERS

⊕ **Vegetables** Sprinkle the black seeds over potato purée or celeriac remoulade to add visual and textural contrast. Scatter over carrots before roasting.

⊕ **Sweet baked goods** Give the moist crumb of an almond and lemon or orange cake a nutty crunch by adding a spoonful of seeds to the batter. Combine with honey and drizzle over baklava.

⊕ **Pastry** Add a spoonful of seeds to savory shortcrust pastry dough for a quiche or a cheese and leek tart.

⊕ **Fruit** Add to a honey and citrus dressing for fruit salad.

⊕ **Oily fish** Ground white seeds work well with Indian spices to make a sauce for trout or salmon.



# AJWAIN

*Bitter | Herbaceous | Peppery*

## BOTANICAL NAME

*Trachyspermum ammi*

## ALSO KNOWN AS

Ajowan, ajave, carom, Ethiopian cumin, omum, bishop's weed

## MAJOR FLAVOR COMPOUND

Thymol

## PARTS USED

Seeds (technically fruits)

## METHOD OF CULTIVATION

The stems are cut when the seeds are ripe, around two months after flowering.

## COMMERCIAL PREPARATION

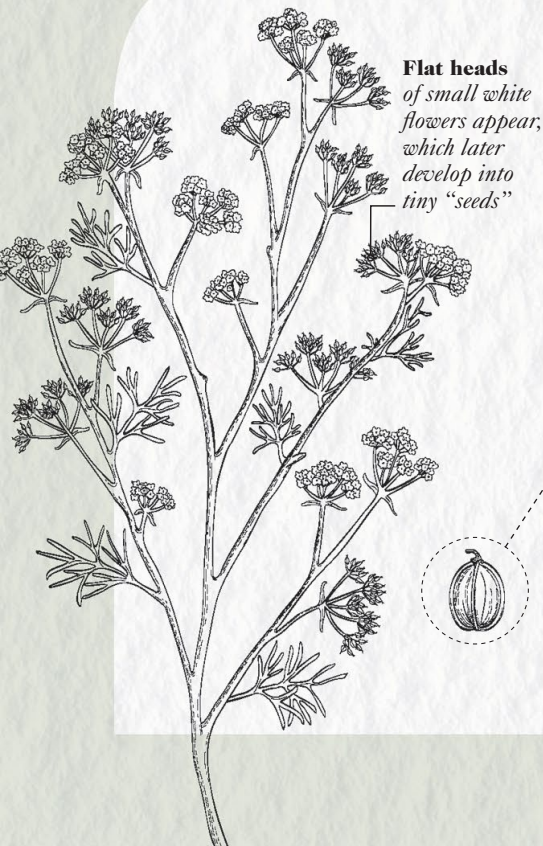
Stems are dried, threshed, and sieved; seeds are then graded and grouped by size.

## NON-CULINARY USES

In perfumes; as an antiseptic agent in toothpastes; in Ayurvedic medicine to treat digestive disorders, rheumatism, arthritis, and fevers.

### The plant

Ajwain is a small annual plant in the parsley family, and is closely related to caraway and cumin.



### Powder

Ground ajwain is available to buy and is less bitter than whole or fresh ground seeds, but adds a much weaker flavor to a dish.

**Oval seeds**  
are greyish-green and resemble those of caraway



### Whole

South Indian seeds have the highest levels of thymol (up to 98 percent of the flavor compound molecules). Whole seeds retain a strong flavor for a very long time.

## Spice story

Ajwain was valued as a medicinal spice from ancient times, and was probably first cultivated in Egypt. The Romans believed it to be a variety of cumin—hence the common name “Ethiopian cumin.” It is believed to have reached India, where it became popular, via the spice caravans at around the same time as cumin seed, soon after 750 CE. It was given a number of misleading names—“celery seed” and “lovage seed” were the most common ones—which persist to this day, even though the taste is very different. For centuries, regions of India practicing Ayurvedic medicine have been making a cure-all tonic “omam water” from ajwain seeds. Although the plant is now mainly cultivated for its potent essential oil, ajwain is one of the defining spices of the vegetarian cuisine of the west Indian state of Gujarat.



### Region of cultivation

Ajwain is probably native to the Middle East, possibly Egypt. It is now cultivated mainly in India and Iran, but also in Pakistan, Afghanistan, and Egypt.

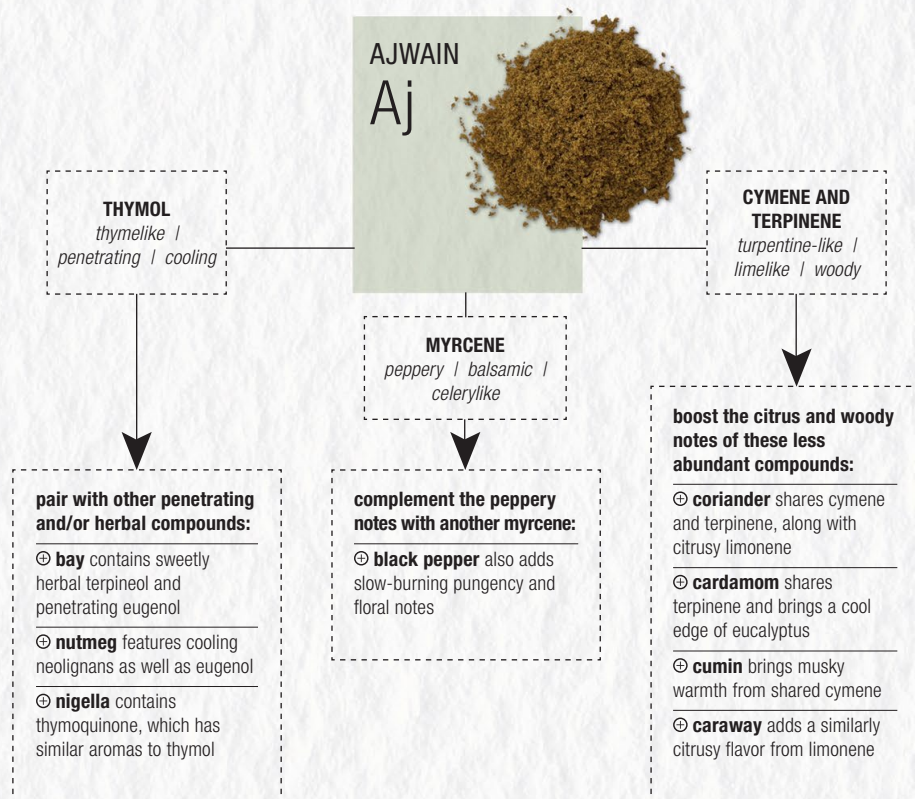


## Kitchen creativity

The flavor of ajwain has been described as a mixture of anise, oregano, and black pepper. Its bitterness can be reduced by toasting or frying it. Ajwain is highly aromatic and pungent, so use it cautiously.

### BLENDING SCIENCE

Ajwain and thyme have similar taste profiles: they both share the same main flavor compound, thymol, which is also found in oregano. This powerful phenol works alongside equally penetrating or herbal spices, while the lesser terpene compounds provide opportunities for bringing out citrus and woody, spicy flavors.

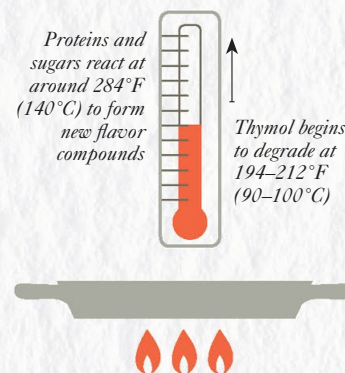


### FOOD PARTNERS

- ⊕ **Fish** Combine bruised ajwain seeds with chili powder and turmeric to make a dry rub for whole or filleted fish. Then fry or oven bake.
- ⊕ **Vegetables** Add lightly crushed ajwain seeds to a chickpea flour batter for vegetable fritters or onion bhajis.
- ⊕ **Lentils** Add whole seeds to melted butter or ghee for an aromatic tempering for lentil soup or dhal.
- ⊕ **Breads** Fry ajwain seeds in oil, ghee, or butter and drizzle over flatbreads, chapatti, or naan.
- ⊕ **Eggs** Fry a pinch of seeds in butter or ghee, and add gently beaten eggs to make Parsi-style scrambled eggs.

### RELEASE THE FLAVOR

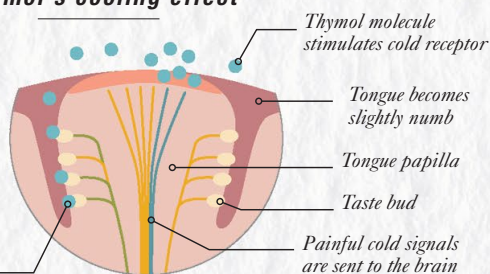
For a more rounded taste, dry roast the whole seeds to create compounds with nutty, roasted flavors, particularly pyrazines. This also dampens the penetrating icy quality because some of the thymol will evaporate and degrade.



### Thymol's cooling effect

As well as having an herbal flavor, thymol has a bitter, cooling effect because its molecules chemically disturb cold-sensing pain fibers in the mouth, tricking the brain into registering a sensation of iciness.

Thymol also activates bitterness in taste buds





# CELERY SEED

*Bitter | Savory | Lemony*

## BOTANICAL NAME

*Apium graveolens*

## ALSO KNOWN AS

Smallage, wild celery

## MAJOR FLAVOR COMPOUND

Sedanolide

## PARTS USED

Seeds (which are technically fruits)

## METHOD OF CULTIVATION

The plant is cut at ground level when the seeds are mature and gray-brown in color.

## COMMERCIAL PREPARATION

The seeds are left to dry for a few days, and then threshed, cleaned, and further dried.

## NON-CULINARY USES

Perfumery; in herbal medicine for water retention, arthritis, and gout; in Ayurvedic medicine as a nerve stimulant and tonic.

### The plant

Wild celery is a biennial herb. It has a thinner, less fleshy stem than cultivated celery. It grows up to 1m (3ft) tall.

### Whole

Use whole seeds and grind them as required. They can be stored in a sealed container in a cool, dark place for up to 2 years.

Ridged seeds are up to 5mm (1/4in) long

Tiny cream flowers are produced in clusters called umbels

Feathery, yellow-green leaves are aromatic

### Powder

Ground celery seed is available to buy, but quickly loses its flavour.

## Spice story

Wild celery has been cultivated for over 3,000 years, and was widely used by the ancient Egyptians, Greeks, and Romans as a panacea, and was grown in most of their herb gardens. The Romans also added the bitter seeds and leaves to bread, wine, soups, cheese, and other foods. By the 6th century CE, wild celery had been introduced to China. Meanwhile in Europe its use spread north to France and England. In medieval Europe it was believed to cure every kind of illness, and was reputed to be an aphrodisiac. By the 17th century, a new, sweeter form of the plant was being cultivated in Italy for use as a vegetable; this is the celery we know today. Its wild relative—smallage—was relegated to seed production, and is still the main source of celery seed.



### Region of cultivation

Wild celery is thought to be native to temperate regions of Europe and western Asia. It is cultivated specifically for its seed mainly in India (which produces more than 50 percent of the world's total crop), but also in China, Egypt, and France.

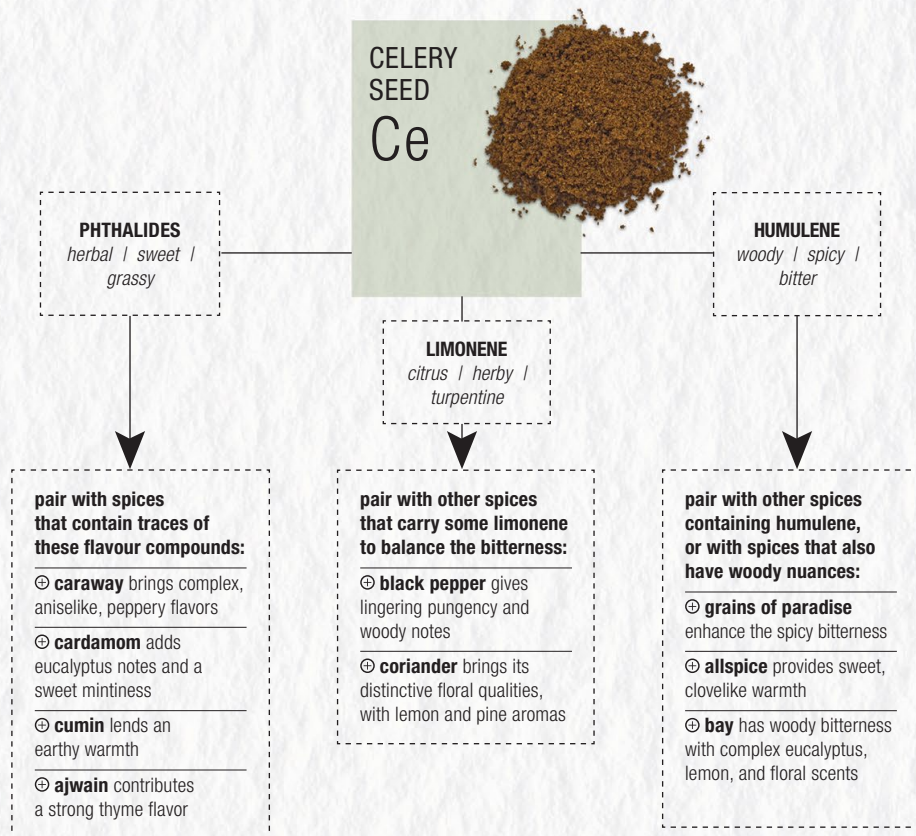


# Kitchen creativity

Celery seeds are more intensely flavored than the stalks and leaves, with a warm, concentrated, earthy taste, lingering bitterness, and hints of grassiness, but without the freshness of the vegetable. Use them judiciously in soups, sauces, and vegetable dishes.

## BLENDING SCIENCE

The most abundant flavor compound in celery seeds is citrus-scented limonene, with lesser amounts of herbal-tasting selinene and woody, spicy humulene. However, the unique herbal taste of this spice is produced by unusually potent lactone compounds called phthalides, which are present in only trace amounts but have a profound effect on the overall flavor.



## FOOD PARTNERS

- ⊕ **Tomatoes** Sprinkle seeds sparingly over grilled tomatoes or a tomato tarte tatin.
- ⊕ **Potatoes** Toss celery seeds in melted butter and drizzle over new potatoes.
- ⊕ **Fish** Add the seeds to a fish chowder, or to the batter for fish goujons.
- ⊕ **Beef** Add a few seeds to pepper as a spice rub for beef brisket.
- ⊕ **Savory baked goods** Add to savory bread dough, cheese biscuits, or oat biscuits for serving with cheese.
- ⊕ **Eggs** Sprinkle lightly toasted seeds over scrambled or deviled eggs.

### Homemade celery salt

Not just for a Bloody Mary, celery salt is a flavorful alternative to ordinary salt that works well with soups, cold salads, and dips. Use a ratio of 1 part celery seed to 6 parts salt.



**Toast** the celery seeds lightly in a dry frying pan to remove moisture.



**Crush** the toasted seeds with sea salt using a pestle and mortar, adjusting the quantities to taste.

## RELEASE THE FLAVOR

Flavors dissolve best in oil, but several of the flavor compounds in celery seed are sensitive to temperatures at either end of the hot-cold spectrum.



**Bitter substances** are destroyed by heat. Toast seeds at the start of cooking to mellow the bitterness.



**Phthalides** turn to vapor when seeds are ground, but chilling beforehand helps to slow the rate of evaporation.



# TURMERIC

*Woody | Floral | Bitter*

## BOTANICAL NAME

*Curcuma longa*

## ALSO KNOWN AS

Indian saffron, false saffron

## MAJOR FLAVOR COMPOUNDS

Turmerone and ar-turmerone

## PARTS USED

Rhizomes (fresh, dried, or powdered); occasionally fresh leaves

## METHOD OF CULTIVATION

This annual crop is grown in heavily manured furrows; rhizomes are harvested when the leaves turn yellow.

## COMMERCIAL PREPARATION

Rhizomes are boiled and dried; they are then sold whole or ground to a powder.

## NON-CULINARY USES

Fabric dye; coloring agent in cosmetics; in traditional medicine as an anti-inflammatory and antimicrobial agent.

### The plant

Turmeric is a leafy tropical plant in the ginger family, which grows as a perennial in the wild.

**Fresh leaves** can be used to wrap foods or as an herb

**Rhizomes** look like smaller, thinner versions of ginger



**Ground turmeric** is less staining than the fresh spice

### Powder

There are two main types: Madras (above) is brighter yellow and sweeter in taste than the pungent, earthy, ochre-colored Alleppey turmeric, which is more prized.

### Fresh

Zesty flavors are more prominent in raw rhizomes. Peel and then chop or grate them, like ginger.



## Spice story

The flavor and properties of turmeric were first appreciated by the ancient Vedic culture of India over 3,000 years ago. The spice still forms a major part of many Indian masala blends, and is used in Hindu rituals to symbolize the sun. Turmeric's influence on Persian and North African cooking dates back to the pre-Christian era, when it first reached these regions via the caravans and ships of the Spice Routes. Ottoman traders introduced turmeric to Europe in the early medieval period, although it was mainly used as a cheap alternative to saffron. The spice gained popularity in Britain during the era of Imperial India, when returning colonial officers recreated the flavors of the Raj with an all-purpose "curry powder," of which turmeric was (and still is) a major constituent.



### Region of cultivation

Turmeric is thought to be native to India. It is cultivated mainly in that country (which produces 90 per cent of all turmeric powder), but also in China, Thailand, Cambodia, Malaysia, Indonesia, and the Philippines.

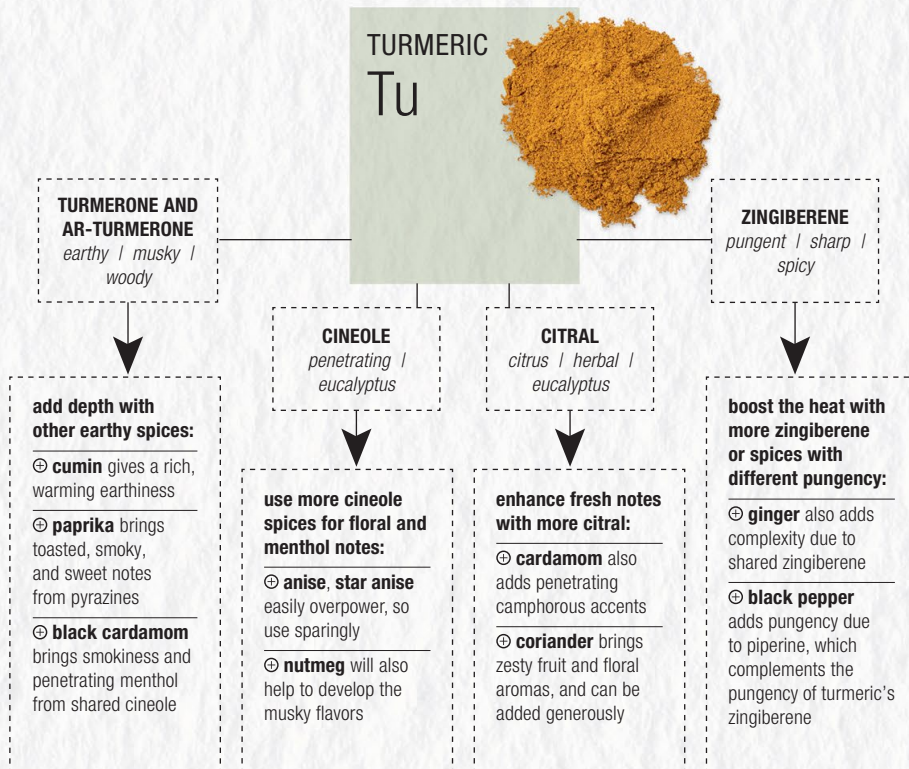


## Kitchen creativity

Turmeric works well in complex blends, where its pungent earthiness acts as a base to help to bind other flavors together. Add sparingly if it is to be used on its own, so the bitter notes do not overwhelm.

### BLENDING SCIENCE

Turmeric's dominant earthy notes are produced by the flavor compounds turmerone and ar-turmerone ("ar-" for "aromatic"), which are found in few other spices. The minor compounds provide more opportunities for effective pairing. Focus on one compound for a particular taste effect, or mix and match several.

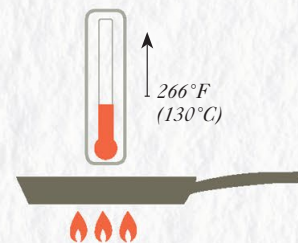


### FOOD PARTNERS

- ⊕ **White fish** Stir together turmeric, yogurt, and crushed garlic, and then spoon over fish fillets before grilling.
- ⊕ **Lamb and pork** Combine with paprika, lightly crushed cumin, and oil for a meat rub, and massage into the skin before roasting.
- ⊕ **Squash and cauliflower** Mix a teaspoonful with oil and honey, and toss with the vegetables before roasting.
- ⊕ **White chocolate** Add a good pinch to cupcake batter along with chunks of white chocolate.
- ⊕ **Pickles** Include thin slices of fresh rhizome in fish and vegetable pickles.

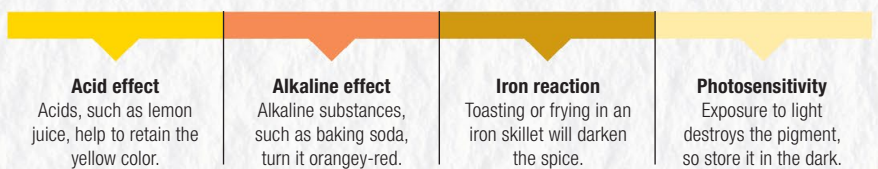
### RELEASE THE FLAVOR

Frying in fat causes flavor compound molecules to disperse and form new compounds. This only happens above 266°F (130°C), so does not occur in boiling water.



### Cooking with curcumin

The incredible staining power of ground turmeric is due to a pigment called curcumin, but you may be surprised to discover that its hue can vary according to how it is used and stored.



### BLENDS TO TRY

Use and adapt these recipes for classic blends featuring turmeric:

*Hawaij* p.29

*Niter kibbeh* p.32

*Malaysian fish curry paste* p.51

*Bumbu* p.52



# FENUGREEK

*Bittersweet | Warm | Musty*

## BOTANICAL NAME

*Trigonella foenum-graecum*,  
*T. caerulea* (blue fenugreek)

## ALSO KNOWN AS

Goat's horn, Greek hayseed,  
Greek clover

## MAJOR FLAVOR COMPOUND

Sotolon

## PARTS USED

Seeds; young leaves

## METHOD OF CULTIVATION

When the seed pods are ripe, plants are pulled up, bundled together, and dried for about a week.

## COMMERCIAL PREPARATION

The stems are threshed to release the seeds, which are then dried and graded.

## NON-CULINARY USES

As a dye; in herbal medicine as a digestive aid and stimulant; in Ayurvedic medicine for hair loss and skin complaints.

## The plant

Fenugreek is an herbaceous annual plant in the bean family, and is a relative of licorice.

## Young leaves

can be eaten as a vegetable, or dried and used as an herb

Pods develop from pealike flowers, are about 4 in (10 cm) long, and contain 10–20 seeds



## Whole

The angular, brownish-yellow seeds have a furrow running across one side.

## Blue fenugreek powder

The ground leaves and seeds of blue fenugreek have a milder, less bitter flavor than ordinary fenugreek and are used in Georgian cuisine (see p.77).



## Spice story

The oldest fenugreek seeds were found at an archaeological site in Iraq, and date back to 4000 BCE. Seeds were also found in the 3,000-year-old tomb of the Egyptian pharaoh Tutankhamen: the Egyptians regarded fenugreek as a panacea. By Roman times, the plant was such a common crop that it was used as fodder for cattle—its name comes from the Latin for “Greek hay.” Its use as a spice crop was mentioned in the 1st century CE by the Greek physician Dioscorides in *De Materia Medica*. At athletic games held by the Syrians a century later, it was a component of a ritual perfume with which participants were anointed. By the Middle Ages, fenugreek was being cultivated as a medicinal herb in Europe. Today it is frequently used in Iranian, West Asian, Indian, and Sri Lankan cuisine, and has spread around the world via commercial curry powder, of which it is a key ingredient.



## Region of cultivation

Fenugreek is native to the eastern Mediterranean region and southwest Asia. It is cultivated mainly in India, but also in Mediterranean countries and North Africa.

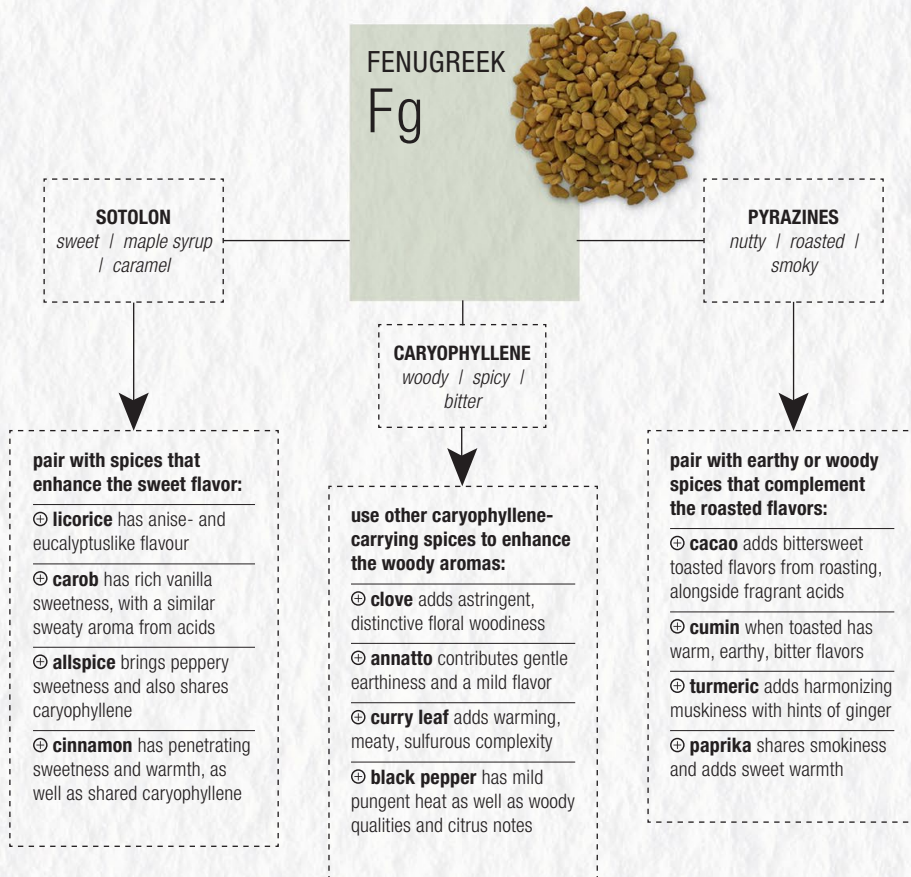


## Kitchen creativity

Fenugreek seeds have a sweet, strong taste, with hints of caramel, maple syrup, burned sugar, and coffee. While its musty aroma is not to everyone's liking, the spice provides a savory, bittersweet background for many dishes.

### BLENDING SCIENCE

Fenugreek's flavor is dominated by sotolon, a sweet lactone compound with a taste like brown sugar with hints of cotton candy. This spice also has woody caryophyllene, with some buttery diacetyl, and mushroomlike vinyl amyl ketone. Pyrazines give toasted seeds roasted, smoky flavors. The sweaty, rancid, musty aromas are produced by a trio of fragrant acids, which some people dislike.



### FOOD PARTNERS

- ⊕ **Pumpkin, sweet potato** Soak fenugreek seeds and add to the base of a pumpkin or sweet potato stew.
- ⊕ **Walnuts** Use blue fenugreek to make the Georgian spiced walnut paste *satsivi*, which can be enjoyed as a dip or used for flavoring meat stews.
- ⊕ **Beef, lamb** Add toasted and soaked fenugreek seeds to add depth to a rich beef or lamb curry.
- ⊕ **Fish Fry** Fry toasted, ground fenugreek seeds in ghee or coconut oil before mixing in fish chunks and coconut milk for a Kerala-style curry.
- ⊕ **Baking** Add soaked and pounded seeds to savory yeasted breads.
- ⊕ **Preserves** Add the ground seeds to fruit chutneys and relishes.

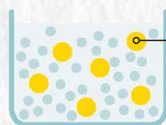
### BLEND TO TRY

Use and adapt these classic blends featuring fenugreek:

- Niter kibbeh** p.32
- Durban curry masala** p.37
- Panch phoran** p.43
- Vindaloo paste** p.44
- Khmeli-suneli** p.77

### RELEASE THE FLAVOR

Fenugreek seeds can help diffuse flavors throughout a dish and thicken sauces by the action of a special emulsifier called galactomannan.



Oil droplets suspended in water

**Galactomannan** in seeds forms a gel in a liquidy dish, allowing oil and water to mix.



**Extract** galactomannan by soaking seeds in water overnight or by simmering.



**Grind** the seeds so galactomannan releases faster. Ground fenugreek can be added directly to a dish.



**Lightly toast** seeds to create nutty, coffee-and-chocolate roasted pyrazine flavors.



# SPICED FILIPINO ADOBO WITH CHICKEN AND PORK

This spicy take on the usually mild Filipino dish imagines what it might taste like had the nation embraced more influences from the spice trade. A classic adobo is made with pork and chicken, but you could use just one or the other—or make a meat-free version with sturdy vegetable chunks, such as butternut squash.

## SPICE IDEAS

Replace the first three sweetly fragrant spices with a **more earthy mix** of cumin, paprika, and turmeric.

Use sulfurous spices, such as mustard, curry leaves, and asafetida, to **emphasize the meatiness** of the dish.

**Alter the citrus-sour profile** by replacing the vinegar with tamarind water and adding lemongrass to the paste mix.

*Serves 4–6*

*Prep time 25 mins*

*Cooking time 1 hour*

seeds of 5 cardamom pods  
1 star anise  
1 in (2.5 cm) piece of cinnamon  
½ tsp roasted chili flakes or chili powder  
1 tsp black peppercorns  
6 garlic cloves, peeled  
2 in (5 cm) piece of fresh root ginger, roughly chopped  
2 tbsp coconut oil or vegetable oil  
6 spring onions, chopped  
2 tbsp palm sugar or muscovado sugar  
2 lb (1 kg) chicken thighs and drumsticks  
10 oz (300 g) pork tenderloin, cut into chunks  
½ cup (100 ml) coconut vinegar or white wine vinegar  
½ cup (100 ml) dark soy sauce  
1 cup (250 ml) chicken stock  
3 bay leaves

**1** Place the cardamom seeds, star anise, cinnamon, chili flakes, and peppercorns in a pestle and mortar, and grind vigorously until the spices have been pulverized. Add the garlic and ginger, and pound to a rough paste.

**2** Put a heavy-based pan or wok on medium heat, add the oil and spice paste, and stir-fry for 2–3 minutes, until the garlic and ginger become fragrant and begin to color.

**3** Stir in the spring onions and sugar, then add the chicken and pork. Stir to coat them with the spice mix.

**4** Pour in the vinegar, soy sauce, and chicken stock. Add the bay leaves and bring to a boil.

**5** Reduce the heat and cover the pan—use foil if your pan does not have a lid. Simmer gently for 1 hour, until the meat is tender and the liquid has reduced. Serve with steamed rice and stir-fried greens.







# WORLD OF SPICE FURTHER RECIPES

The following recipes for classic dishes from around the world are as delicious as they are authentic; each features one of the traditional spice blends or sauces from the World of Spice chapter (pp.18–77).

## LAMB KOFTE

Makes 12

*Prep time 20 mins, plus 20–30 mins soaking*

*Cooking time 8–10 mins*

¼ cup (50 g) bulgur wheat  
¼ cup (50 g) apricots, roughly chopped  
½ cup (100 ml) boiling water  
1 lb (500 g) lamb mince  
1 small onion, finely chopped  
1 tsp pine nuts  
2 cloves garlic, peeled and crushed  
1 tsp chopped fresh mint, plus extra leaves to serve  
3 tsp *baharat* spice (see p.23)  
salt, to taste  
flatbread, red onion, tomatoes, and plain yogurt, to serve

- 1 Put the bulgur and apricots into a small pan. Pour over ½ cup (100 ml) boiling water, cover, and set aside for 20–30 minutes, until all the liquid is absorbed.
- 2 Put lamb, onion, pine nuts, garlic, and mint in a bowl with 1 tsp of *baharat* spice and a pinch of salt, and mix together with a fork. Add the bulgur and apricots and knead the mixture until it forms a paste and holds together well.
- 3 Divide the lamb mixture into 12 portions and roll each portion into a ball.
- 4 Sprinkle the remaining 2 tsp of *baharat* spice onto a plate, and then roll each ball to coat it evenly with the spice.
- 5 Thread a skewer through the center of each ball, and squeeze the ball into a sausage shape about 3–4 in (8–10 cm) long around the skewer.
- 6 Preheat a grill or a griddle pan to medium–high heat. Cook for 8–10 minutes, turning until crisp and evenly browned on the outside and cooked through in the center. Cook in batches if necessary.
- 7 Serve with flatbread, topped with sliced red onion, diced tomatoes, fresh mint leaves, and a dollop of yogurt.

## PERSIAN RICE PUDDINGS

Serves 6

*Prep time 15 mins, plus up to 1 hour infusing*

*Cooking time 45–50 mins*

½ cup (150 g) short-grain white rice, washed  
2½ cups (600 ml) full-fat milk  
1¼ cups (300 ml) heavy whipping cream  
2 tsp honey  
strip of zest from 1 orange  
2 tsp orange flower water  
1 vanilla pod, split and seeds scraped out  
pinch saffron strands, ground to a powder  
1 tsp *advieh* spice mix, plus extra to serve (see p.27)  
6 Medjool dates, pitted and roughly chopped  
1 tsp pistachio kernels, cut into slivers  
1 tsp dried rose petals

- 1 Preheat the oven to 325°F (160°C).
- 2 Divide the rice between six 7 fl oz (200 ml) ramekins.
- 3 Combine the milk, cream, honey, orange zest, orange flower water, vanilla pod and seeds, and ground saffron in a large, heavy-based saucepan. Set over medium heat, stirring until the honey dissolves and the saffron turns the milk pale yellow.
- 4 Heat to just below boiling point, then turn off the heat and allow to infuse for at least 10 minutes, or up to 1 hour.
- 5 Strain the milk, discarding the zest and vanilla pod, and divide between the six ramekins, pouring it over the rice. Sprinkle the *advieh* spice mix over the surface of each pot.
- 6 Cook for 45–50 minutes or until the rice is completely soft and the spice has formed a thin brown skin on top.
- 7 Remove the pots from the oven and allow to cool a little.
- 8 Top each pudding with chopped dates, pistachios, and dried rose petals. Sprinkle over a little more of the *advieh* and serve warm or cold.



**DURBAN BEEF BUNNY CHOW**

Serves 4

*Prep time 30 mins**Cooking time 40–50 mins*

2 tbsp olive oil  
 2 black cardamom pods  
 2 small cinnamon sticks  
 1 tsp fennel seeds  
 1 large onion, chopped  
 2 tbsp Durban curry masala (see p.37)  
 2 tsp fresh root ginger, grated  
 4 garlic cloves, peeled and crushed  
 2 tbsp tomato purée  
 2 ripe tomatoes, roughly chopped  
 1 lb (500 g) lean stewing beef, cut into ½–¾in (1–2 cm) pieces  
 1 large potato, cut into ½–¾in (1–2 cm) pieces  
 12 fresh curry leaves, or 6 dried curry leaves  
 1¼ cups (300 ml) water  
 salt and freshly ground black pepper, to taste  
 handful fresh cilantro, chopped, plus extra to garnish  
 ½ lime  
 2 small white crusty bread loaves (a 5½ x 3 loaf pan is perfect), halved and hollowed out

- 1** Heat the oil in a large pan, and then fry the cardamom, cinnamon, and fennel seeds for a minute or so, until aromatic.
- 2** Add the onion, and soften for 5–8 minutes over medium heat.
- 3** Sprinkle the masala and stir to coat the onions, then add the ginger, garlic, and tomato purée, and cook for 1 minute.
- 4** Add the tomatoes, stir, and cook for 4–5 minutes, until the mixture becomes saucelike.
- 5** Stir in the beef, potatoes, curry leaves, and water. Season with salt and pepper.
- 6** Bring to a simmer, cover, and cook for 40–50 minutes, stirring occasionally, until the meat is tender and the potatoes are soft.
- 7** Stir in the cilantro plus a squeeze of lime to taste. Remove and discard the cinnamon, cardamom, and curry leaves before serving.
- 8** Divide the curry between the four half loaves of bread, spooning it into each hollowed-out half. Garnish with the extra cilantro and serve immediately.

**CHANA MASALA WITH SWEET POTATO AND SPINACH**

Serves 4

*Prep time 20 mins**Cooking time 30–35 mins*

1 tbsp vegetable or coconut oil  
 1 tsp cumin seeds  
 1 large onion, roughly chopped  
 2 garlic cloves, crushed  
 ¾ in (2 cm) fresh root ginger, peeled and grated  
 2 tsp ground coriander  
 1 tsp paprika  
 1 tsp ground turmeric  
 1 medium sweet potato, peeled and cut into ¾ in (2 cm) chunks  
 1 (14.5 oz) can chopped tomatoes  
 2 (14.5 oz) cans chickpeas in water, or ¾ cup (200g) dried chickpeas or chana dhal, soaked overnight then cooked in fresh water until tender, cooking water reserved  
 1–2 green chilis, cut into chunky pieces  
 salt, to taste  
 2½ oz (75 g) baby spinach, washed  
 1–2 tsp garam masala, to taste (see p.40)  
 ½ lemon  
 naan bread, to serve

- 1** Heat the oil in a large, heavy-based pan over medium–high heat. When the oil is hot, add the cumin seeds. Fry for a minute or so until aromatic, add the onion, and then reduce the heat. Cook for 5–8 minutes until softened.
- 2** Add the garlic and ginger and stir for a minute or so, then add the ground coriander, paprika, and turmeric, stirring for a further 2 minutes.
- 3** Add the sweet potato and turn it to coat it well with the spices.
- 4** Stir in the tomatoes and chickpeas with their liquid. Alternatively, if using dried chickpeas or chana dhal, add about 1¼ cups (300ml) of the reserved cooking water. Stir in the chili pieces (include the seeds for extra heat), bring to a simmer, then turn the heat to low, cover, and cook for 25–30 minutes, until the potatoes are tender and the sauce has thickened. Season with salt.
- 5** Add the spinach, and stir for 3–4 minutes until it wilts.
- 6** Stir in the garam masala, and squeeze in some lemon juice to taste. Adjust the seasoning, then serve immediately with warmed naan bread.

**MASOR TENGA FISH CURRY**

Serves 4

*Prep time 10 mins, plus 10–15 mins marinating**Cooking time 30 mins*

4 sea bream or gray mullet fillets, de-scaled, with skin on  
 ½ tsp salt  
 1 tsp ground turmeric powder  
 2 tbsp oil, such as coconut or rapeseed  
 1 tsp yellow mustard seeds, coarsely ground  
 1 tbsp *panch phoran* (see p.43)  
 1 onion, sliced  
 2 green chilis, seeded and halved lengthways  
 2 ripe tomatoes, roughly chopped  
 1 tbsp yellow mustard paste  
 1–2 tsp red chili flakes  
 ½–¾ cup (150–200 ml) water  
 juice of 1 lime  
 handful of fresh cilantro leaves, to garnish  
 rice, to serve

- 1** Place the fish on a plate and rub with the salt and turmeric. Cover, and set aside for 10–15 minutes.
- 2** Melt half the oil in a frying pan over medium–high heat and add the mustard seeds. Stir for a few minutes until they become fragrant. Lay the fish in the pan, skin side down, and leave to cook for 3–4 mins. Once the skin is crisp and golden, turn and cook for another 2–3 minutes until the fish is just cooked through. Transfer the fried fish to a plate, cover, and set aside.
- 3** Heat the remaining oil in the pan over high heat, and add the *panch phoran*. Let the seeds splutter and pop for 1 minute.
- 4** Turn the heat down to medium and stir in the onion and chilis. Fry gently for 3–4 minutes, until they are just softened and golden.
- 5** Now stir in the chopped tomatoes and cook for 4–5 minutes until they soften.
- 6** Add the mustard paste with the chili flakes and cook for another 4–5 minutes, stirring.
- 7** Pour in water, and then add lime juice to taste. Bring to a gentle simmer.
- 8** Carefully add the fried fish pieces back into the sauce, skin side up, and heat through for 2–3 minutes.
- 9** Garnish with chopped cilantro leaves and serve with rice.



**GOAN VINDALOO****Serves 4***Prep time 30 mins, plus 1 hour or overnight marinating**Cooking time 30–40 mins*

2 tbsp olive oil  
 1 lb (500 g) skinless, boneless chicken thighs or pork shoulder, cut into 1 in (3 cm) chunks  
 1 medium eggplant, cut into  $\frac{3}{4}$  in (2 cm) chunks  
 1 batch vindaloo paste (see p.44)  
 2 large garlic cloves, peeled and crushed  
 2 in (5 cm) fresh root ginger, peeled and grated  
 2 tbsp coconut oil  
 1 large onion, roughly chopped  
 2 ripe tomatoes, cut into chunks  
 1–2 green chilis, thickly sliced  
 1 cup (250 ml) chicken stock  
 1 tbsp jaggery or soft brown sugar, plus extra if needed  
 1 tbsp coconut or cider vinegar  
 salt, to taste  
 handful cilantro leaves, to garnish  
 rice, yogurt, and lime pickle, to serve

**1** Put the chicken or pork and eggplant in a bowl, and stir in the vindaloo paste along with the garlic and ginger. Mix well, cover, and marinate for at least 1 hour, or refrigerate and leave overnight if preferred.

**2** Preheat the oven to 375°F (190°C).

**3** Heat the oil in an ovenproof pan and fry the onion over a low heat for 10–15 minutes, until soft and golden.

**4** Add the meat and eggplant, along with the marinade, and cook, stirring, for 4–5 minutes to brown all over.

**5** Now add the tomatoes, chilis, and stock, and bring to a simmer. Stir in the jaggery and vinegar until the sugar has dissolved.

**6** Cover and transfer to the oven. Cook for 30–40 minutes, until the chicken is tender, the eggplant is soft and melting, and the sauce has thickened. Taste and adjust the seasoning.

**7** Sprinkle with cilantro and serve immediately with rice, yogurt, and lime pickle.

**PRAWN SUMMER ROLLS****Makes 12***Prep time 45 mins*

4 oz (100 g) dried vermicelli rice noodles or bean thread noodles, or use a 10 oz (300 g) pack of cooked rice noodles  
 12 round rice paper wrappers, 8 in (20 cm) in diameter  
 handful Thai basil  
 24 cooked prawns, cut in half lengthways  
 2 or 3 large iceberg lettuce leaves, torn into 12 pieces  
 1 carrot, grated  
 $\frac{1}{2}$  cucumber, cut into 2 in (5 cm) long matchsticks  
 2 spring onions, cut lengthways into strips  
 handful cilantro leaves  
 handful mint leaves  
 4 tbsp salted peanuts, roughly chopped  
 1 lime, halved  
*nuoc cham* dipping sauce, to serve (see p.50)

**1** Soak the dried rice noodles, if using, in a bowl of hot water for 3 minutes, then drain and rinse with cold water. They should be just tender, but not too soft.

**2** Lay out all the ingredients ready to make the rolls. Dip one of the rice papers in a bowl of hot water, moving it around for 10–15 seconds until the whole wrapper is pliable but not completely soft. Lay it on a board and pat dry with a tea towel.

**3** At the bottom edge of the wrapper, place three Thai basil leaves face down, side by side, and then lay four prawn halves on top in a horizontal row.

**4** Place a piece of lettuce on top of the prawns, followed by some noodles, a few strips of carrot, cucumber, and spring onions, then some cilantro and mint leaves, and finally the nuts. Squeeze a little lime juice over the vegetables. Do not overfill the rolls or they will be hard to shape.

**5** Lift the edge of the rice paper wrapper nearest to you over the filling and, holding the filling in position with your fingers, tuck it under and start rolling tightly.

**6** When you are about halfway, fold the ends of the rice paper in and over the filling. Continue rolling the filling as tightly as possible so that it is completely enclosed, and press lightly to ensure that it has stuck.

**7** Repeat with the other wrappers and the remainder of the fillings. To serve, cut the rolls in half on the diagonal, and serve at room temperature with the *nuoc cham* dipping sauce.

**8** If you are making the rolls in advance, cover them with cling film or a damp tea towel to prevent them from drying out.

**NANJING SALTED DUCK****Serves 4***Prep time 20 mins, plus overnight marinating**Cooking time 15 mins, plus 2 hours cooling*

2 tbsp salt  
 2 tbsp whole Sichuan peppercorns, lightly crushed with a pestle and mortar  
 2 whole duck legs, about 7 oz (200 g) each  
 2 duck breasts, about 6 oz (175 g) each  
 1 Nanjing spice bag (see p.59)  
 2 in (5 cm) fresh root ginger, sliced, and then pulverized using a pestle and mortar  
 3 spring onions, trimmed and cut into large segments  
 $\frac{1}{2}$  cup (125 ml) Shaoxing wine  
 2 tsp sesame oil

**1** Heat a frying pan over medium heat. Add the salt and Sichuan peppercorns and toast them, stirring, for 5–8 minutes until the salt turns yellow/brown. Let the pan cool.

**2** Lightly score the skin of the duck pieces with a sharp knife. Rub the salt and peppercorns into the skin and flesh, cover loosely with foil, and then marinate overnight in the fridge.

**3** When you are ready to cook the duck, lay all the pieces in the bottom of a large pan with the salt and peppercorns. Cover with 6–8 cups (1.5–2 liters) of water. Add the spice bag, ginger, and spring onion. Bring to a boil, then add the Shaoxing wine. Reduce the heat, and simmer gently for 15 minutes.

**4** Turn off the heat and allow the duck to cool in the liquid, with the pan covered.

**5** Transfer the duck to a cutting board and discard the cooking liquid, or strain and reserve it for use as stock.

**6** Drizzle the sesame oil over each piece of duck. Cut the breast into thick slices, and divide the legs in half between the joint to separate the leg and thigh. Eat warm, or leave to cool. Serve 1 piece of leg and some sliced breast per person.



## PRAWN AND VEGETABLE STIR-FRY

Serves 4

Prep time 10 mins

Cooking time 10 mins

9 oz (250 g) fine egg thread noodles  
 2 tbsp peanut oil  
 1 onion, peeled and cut into chunks  
 1 red pepper, seeded and cut into chunks  
 1 in (2 cm) fresh root ginger, peeled and cut into matchsticks  
 2 large garlic cloves, peeled and sliced  
 9 oz (250 g) large, raw prawns, peeled and de-veined  
 4 oz (100 g) baby corn cobs, sliced in half on the diagonal  
 2 tbsp light soy sauce  
 2 tbsp Shaoxing wine, or similar rice wine  
 juice of half a lime  
 4 oz (100 g) fresh snow peas  
 1 tbsp five-spice powder (see p.60)  
 2 tbsp black sesame seeds  
 2 tbsp toasted sesame oil

**1** Put the noodles into a saucepan and pour boiling water over them. Cover and leave to stand while you make the stir-fry.

**2** Heat the oil in a large frying pan or wok, and stir-fry the onion and pepper over a high heat for 2 minutes, until softened and slightly charred.

**3** Add the ginger, garlic, and prawns, stirring constantly for 2 minutes until the prawns are just pink.

**4** Add the baby corn to the pan with the soy sauce and wine. Simmer for 1 minute.

**5** Stir in the snow peas and five-spice powder, then remove from the heat.

**6** Drain the noodles, and stir in the sesame seeds and oil. Serve immediately with the hot stir-fry.

## PIPARKAKUT

Makes about 40

Prep time 20 mins, plus cooling, chilling, and resting

Cooking time 10–12 mins

1 tbsp (60 g) honey  
 1 tbsp (60 g) blackstrap molasses  
 ½ cup (125 g) unsalted butter  
 ½ cup (100 g) dark brown sugar  
 2¼ cups (350 g) all-purpose flour, plus extra for dusting  
 1 tsp baking soda  
 1 tbsp Finnish gingerbread spice (see p.72)  
 ¼ tsp ground white pepper  
 1 egg  
 2 tbsp chopped crystallized ginger, to decorate (optional)

**1** Put the honey, molasses, butter, and sugar into a saucepan, then place on low heat, and melt all the ingredients together.

**2** Once melted, set aside to cool for at least 10 minutes.

**3** Sift the flour, baking soda, spice mix, and pepper into a large mixing bowl, and stir them together.

**4** Pour the molasses mix into the flour mix.

**5** Crack in the egg, then stir the ingredients together to form a smooth, dark paste.

**6** Cover and place in the fridge for at least 1 hour to rest. It can be left overnight if preferred.

**7** Take the dough out of the fridge and allow it to reach room temperature. Then gently knead it into a ball.

**8** Preheat the oven to 375°F (190°C), and line a cookie sheet with parchment paper.

**9** On a lightly floured surface, roll out the dough to ⅛ in (2–3 mm) thick.

**10** Cut the cookies out to any shape you like, rerolling any trimmings. Then space them slightly apart on the lined cookie sheet. If decorating with crystallized ginger, push a few pieces into each cookie. Bake for 10–12 minutes.

**11** Cool on the tray for 10 minutes, and then transfer the firm cookies to a cooling rack. They can be stored in an airtight container for up to 1 week.

## PAELLA

Serves 6

Prep time 30 mins

Cooking time 50 mins

4 tbsp olive oil  
 10 oz (300 g) chicken thighs, cut into chunks  
 ⅔ cup (150 g) diced pancetta  
 ⅔ cup (150 g) chorizo, cut into thick slices  
 1 large Spanish onion, roughly chopped  
 1 red pepper, seeded and cut into chunks  
 1 green pepper, seeded and cut into chunks  
 1 tbsp paella mix (see p.74)  
 1 cup (250 g) Calasparra (Spanish short-grain) rice, or other paella or risotto rice  
 ¾ cup (150 ml) Fino sherry, or dry white wine  
 ¾ cups (750 ml) hot fish or chicken stock  
 1 cup (200 ml) tomato paste  
 5 oz (150 g) prepared squid, sliced into rings  
 juice and zest of 1 lemon, plus extra wedges to serve  
 salt and freshly ground black pepper, to taste  
 12 clams, cleaned  
 6 mussels, scrubbed and with beards removed  
 6 cooked shrimp or whole, large, shell-on prawns  
 handful fresh flat-leaf parsley, roughly chopped

**1** Heat 2 tbsp of the olive oil in a paella dish or heavy-based saucepan. Add the chicken, pancetta, and chorizo, and stir over medium–high heat for 8–10 minutes, until browned all over. Remove with a slotted spoon and transfer to a plate.

**2** Add the remaining oil to the chorizo oil in the pan, then cook the onion and peppers over medium heat for 5–8 minutes, until softened.

**3** Stir in the paella spice mix along with the rice. Stir for a minute or so, until all the grains of rice are well-coated and glossy.

**4** Now add the sherry and turn up the heat, allowing the liquid to bubble and the rice to absorb it. Pour in the hot stock and the tomato paste, and reduce to a simmer for 10 minutes, stirring occasionally.

**5** Return the meat to the pan, stir, and cook gently for another 10 minutes.

**6** Now stir the squid rings into the rice, along with the lemon zest plus juice, and season to taste. Ensure that all the clams and mussels are tightly closed, then push them into the rice and cover with a lid or foil. Steam for 4–5 minutes until all the mussels and clams have opened (discard any that have not).

**7** Now sit the shrimp on top, cover, and steam for a further 5 minutes, until everything is cooked through, the rice is tender, and most of the liquid has been absorbed. Do not stir at this point—this will help a crust to form—but keep the heat low so it does not burn.

**8** Sprinkle the chopped parsley over the paella and serve immediately with the extra lemon wedges on the side.



















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# About the Authors

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Specializing in food science, Dr. Stuart Farrimond is a science and health writer, presenter, and communicator. He makes regular appearances on TV, radio, and at public events. He is a trained medical doctor and teacher, and his writing appears in the national and international press, including *New Scientist*, *The Independent*, the *Daily Mail*, and *The Washington Post*. Dr. Stuart presents a weekly radio science show, and his widely publicized food research has addressed a broad range of topics. He is the author of DK's *The Science of Cooking*.

*Stuart oversaw all scientific aspects of the project, and wrote the Spice Science chapter and all science-based content in the Spice Profiles chapter, including information on blending science and getting the most flavor from spices.*

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*Laura wrote all the non-science content of the Spice Profiles chapter.*

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*Jan wrote the World of Spice Further Recipes.*

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Freda resides in the Nigerian city of Lagos where she is acquiring primary knowledge in the use of local spices, from fermented locust beans to a vast array of chilis, pipers, and cubebs.

*Freda wrote on Africa in the World of Spice chapter, as well as the recipes for West African Peanut Curry with Durban Masala and Sweet and Spicy Apple Pastry Rosettes.*

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*Annica wrote on Southeast Asia in the World of Spice chapter, as well as the recipes for Asian Larb Salad with Curried Duck and Khao Kua, and Spiced Filipino Adobo with Chicken and Pork.*

**Yolanda Zappaterra** is a food, travel, and design writer. Born to Italian parents in South Wales, Yolanda's early introduction to "spicy" cooking was Vesta curries, her mother's misguided attempts to anglicize the repertoire of Neapolitan cuisine that she had brought with her, as a way of fitting in. None of this deterred Yolanda's palate or food-writing ambitions, and she has since worked as a food writer and editor for *Time Out*, *Lonely Planet*, and *The Independent*, among many others. Her home cooking has broadened out from the regional Italian dishes she learned in her mother's kitchen to include her in-laws' Chinese and Caribbean dishes, so dinner at her house could be a multi-layered *parmigiana*, a spicy *mapo tofu*, or Trinidad doubles.

*Yolanda wrote on East Asia in the World of Spice chapter, as well as the recipes for Chinese Steamed Salmon with Chili and Star Anise and Black Sesame, Licorice, and Cardamom Ice Cream.*

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### FROM THE AUTHORS

#### **Dr. Stuart Farrimond**

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