

Material profiles

The Spice Trail: Nutmeg

Origins, cultivation and processing

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Nutmeg and its sister spice, mace, come from the nutmeg tree (*Myristica fragrans*). This evergreen tree is native to the Molucca (or Banda) Islands in East Indonesia — known as the “Spice Islands” — and elsewhere in Indonesia. Nutmeg is now also grown in Grenada in the West Indies, where it is the national emblem, in addition to Sri Lanka, Africa, Southern India, Fiji and Malaysia.

International trade in nutmeg originated in the Middle East in the sixth century. Merchants from the region were the exclusive importers of the spice for Europe until 1512, when the Portuguese claimed the Moluccas. The Dutch followed in 1602. In 1796, the British took over the Moluccas and spread cultivation to other East Indian islands and the Caribbean.

John Eldred — an early British merchant traveler and one of the first directors of the East India Co. — first brought nutmeg to England. Eldred amassed great wealth from trading with Baghdad, Iraq. In fact, by the end of the medieval period, nutmeg was the second-most-popular spice, after pepper. It was commonly used in barley beer and as a flavoring in wine.

Cultivation

The nutmeg tree can grow to a height of 98.5 ft, but it normally reaches between 26 and 40 ft. It usually is cultivated in valleys at an altitude of around 1,640 ft. Nutmeg trees take five to eight years to produce the first harvest, but older ones are the most productive. Trees reach their yield potential after 15–30 years; a single mature tree can produce up to 2,000 nutmegs per year.

Nutmeg trees bear round pale yellow fruit, which resemble an apricot or a small peach. The fruit yields two spices — nutmeg and mace — which have similar flavor profiles. Nutmeg has a characteristic pleasant fragrance, and a slightly sweet, warm,

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aromatic and nutty flavor. Mace is more fragrant and has a more delicate, refined flavor. Whole or ground nutmeg comes from the oval-shaped inner seed kernel, whereas mace is obtained from the dried hull (called the aril) that separates the seed from the outer husk (the pericarp).

Several other commercial products also originate from the nutmeg tree, including butters and oleoresins, which are used mainly in flavors, perfumes and cosmetics.



Mature Sri Lankan nutmegs

Essential Oils

Nutmeg and mace contain 7–14 percent essential oils. Essential oil is obtained via steam distillation of ground nutmeg. The distillation time is dependent upon the origin and exact method used, but ranges from 8–24 h. A constant power source is required to produce the constant steam needed for effective and efficient distillation. Indonesia produces some 300 mt of nutmeg essential oil per annum, while the rest of the world produces approximately 50 mt per annum.



Mature nutmegs with mace

T-1 and the GLC traces contained in F-1 highlight the varying levels of the main components of nutmeg essential oils from three sources: Grenada (West India), Sri Lanka and East India. It can be seen that there are some key compositional differences — in particular, the levels of safrole and myristicin. The two most variant oils are those from Grenada and the East Indies. The latter is much higher in myristicin, while the former is higher in terpinene-4-ol. These two components bring their own special characteristics. Terpinene-4-ol introduces a green note, while myristicin brings a harsher, spicy woodlike character. The Sri Lankan oil lies somewhere between the two and often is used in fragrance compositions, as it tends to be smoother and less crude in odor.

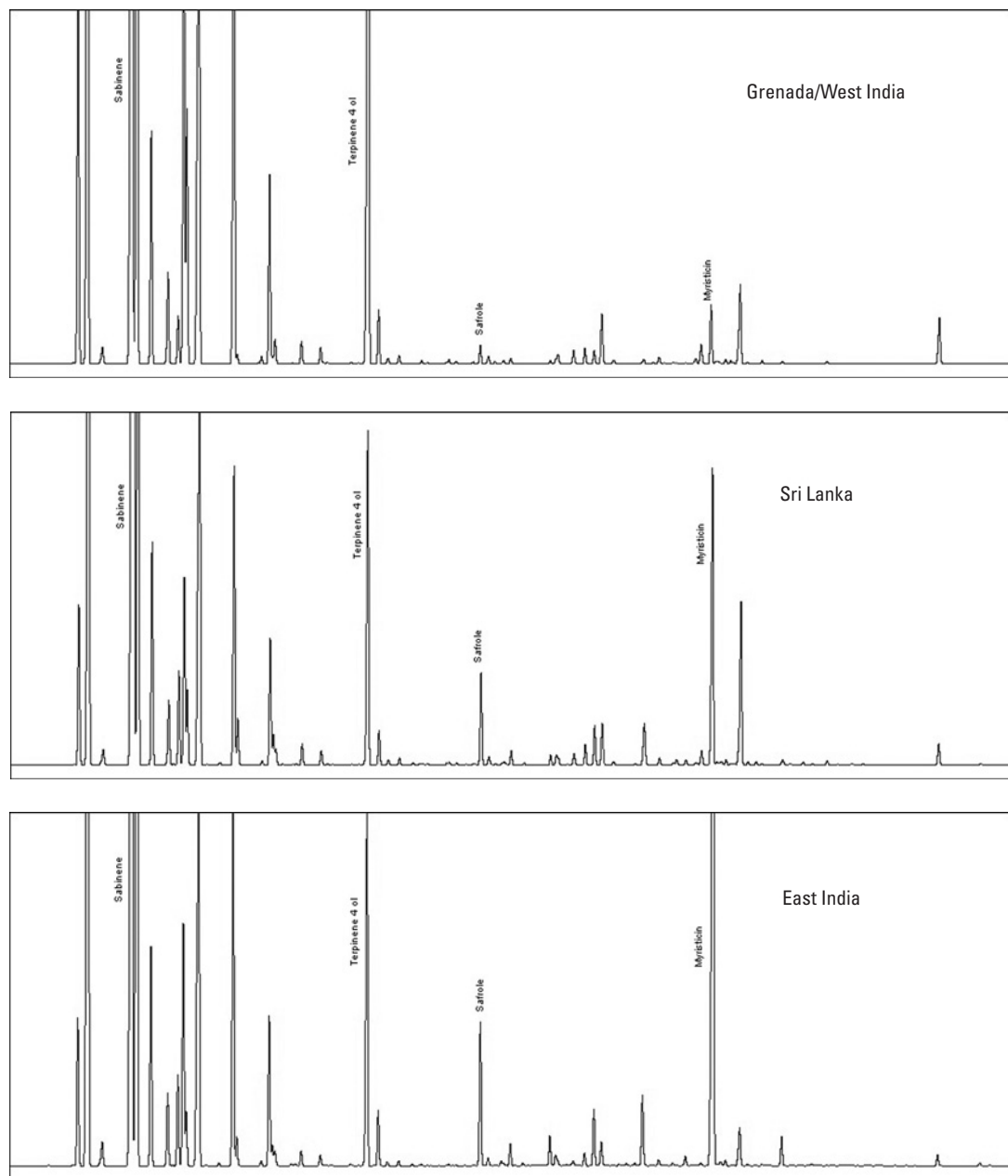
Main components of nutmeg essential oils				T-1
	Grenadian Oil	Sri Lankan Oil	East Indian Oil	
α -thujene	4.7	1.2	1.7	
α -pinene	11.5	14.8	22.3	
sabinene	28.2	41.8	19.5	
β -pinene	10.8	12.0	14.8	
limonene	4.0	3.7	3.9	
1,8-cineole	3.2	2.2	2.1	
terpinen-4-ol	9.5	2.2	4.3	
safrole	0.17	0.9	1.7	
myristicin	0.52	4.1	10.2	
elemicin	0.94	2.1	0.37	

Summary

Nutmeg has become a key ingredient for the aroma and flavor it brings to foods and drinks. It is commonly added to sweet, spicy and savory products, such as rice pudding, beverages, curries, sauces, sausages and convenience products, and also provides the distinct flavor to the festive drink eggnog. In addition to its culinary uses, throughout the years nutmeg has been consumed for its pharmaceutical properties. Middle Eastern cultures used it to treat digestive disorders; the Indians utilized it for asthma and heart complaints; and some still use it as a sedative. In years past, in certain English counties, the nutmeg was considered to hold magical powers. In Yorkshire, nutmeg was believed to relieve rheumatic pain; in Lincolnshire, it was used to cure backaches; and in

The varying levels of the main components of nutmeg essential oils from Grenada (West India), Sri Lanka and East India

F-1



Devon, it alleviated boils! Even today, some still extol the beneficial health properties of this historically significant spice. Whether culinary or medicinal, the nutmeg is a spice whose popularity spans all corners of the world.

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