

VANILLA - AN ORCHID, WHICH GIVES RISE TO A MOST POPULAR FLAVOUR

Ayesha.

INTRODUCTION.

The culture of "ice cream" may have arisen in Europe, but today, nothing is more universal, on a warm afternoon than the lure of an ice cream. In these modern times when flavours are so varied and so numerous, the original classical vanilla flavour is still the most popular and most widely enjoyed. Vanilla is derived from a plant of the family Orchidaceae, and is of Mexican origin. It is now cultivated throughout the tropics. The botanical name for the widely cultivated variety is *Vanilla planifolia*, but other varieties do exist, but their content of the aroma-giving substance vanillin, is lesser. Vanilla is a climbing vine and needs to be supported on some existing tree or pole.



Vanilla flower

The fruits, - elongated seed pods, often referred to as beans, - results from the pollination of the flower, one flower giving rise to one bean. Growers generally use artificial pollination as insects shy off from the toxic plant. The method of pollination used is one originally devised by a 12 year old slave named Edmund Albius of Reunion..

If left on the plant, the mature seed pod ripens and opens at the end releasing the characteristic aroma of vanilla. The seeds are numerous, tiny like specks, and flavourless. Growers use vegetative propagation for reproduction. Cuttings with six or more leaf nodes with a root opposite each leaf are planted in loose soil at the base of a support.

HISTORICAL

The Spanish following the historic voyages of Christoforo Columbus, first brought vanilla to Europe. The Aztecs used vanilla as a flavouring agent, for their chocolate drinks. In Ancient Mexico the Totonac people, were noted as the producers of the best vanilla. This region, the present-day Veracruz, continued to be the main producers throughout the nineteenth century. The French colonists traded their knowledge of artificial pollination with the cultivators of Mexico for the traditional Totonac knowledge of curing and seasoning the vanilla pods. Soon the vanilla bean was being cultivated in the French colonies such as Reunion, Comoros, and Madagascar, today's main supplier. Vanilla is a tropical crop and grows well in countries such as Madagascar where it is cultivated. The vines are trained using support posts and/or support trees. Natural pollination can only be brought by a species of Mexican bee, and a type of Mexican Hummingbird. They are capable of penetrating the tough membrane that separates the plant's pistol and stamen. When planters first transplanted vanilla, into other countries, they were unable to obtain the beans. In 1836, A Belgian Botanist, Charles Morren recognized that for the flowers to be pollinated some external intervention would be needed. It was after that, that the



successful methods of the slave Edmund Albiem came to be universally applied by cultivators.

GLOBAL PRODUCTION

Presently several countries are on record (FAO statistics) as producers of vanilla. (Table 1.)

TABLE 1

COUNTRY	PRODUCTION (TONNES)	%of Global Production.
Madagascar	6200	59
Indonesia	2399	23
China	1000	10
Mexico	189	-
Turkey	170	
Comoros	140	
Tonga	130	
Belgium	100	
Uganda	70	
Australia	---	



Vanilla beans

Other minor producers are, Uganda, French Polynesia, Reunion, Malawi, Zimbabwe, Portugal Kenya and Guadeloupe. (FAO. <http://faostat.fao.org./site567/DesktopDefault.aspx?PageID=567>. Australia is a newcomer in the trade.

The Coca-Cola Corporation is the largest consumer of natural vanilla. The introduction of synthetic vanilla dramatically hit the producers of natural vanilla for a time but later trends restored the market for natural vanilla. Weather patterns, Typhoons and political vicissitudes, resulted in vanilla prices soaring upwards to an astonishing level of US\$.500 per kg.in 2004. By the mid 2005 prices leveled again at around US\$ 40-50 per kg.

PROCESSING AND CURING.

The method of processing of the vanilla pods is an elaborate one and experience in the art is a key issue in the production of quality material. The individual steps of the production process are as follows:

* **Harvesting of the Pods.**

The pods are harvested when still green. They are then odourless.

* **"Killing" or Inactivation of vegetative tissue**

Several methods are used. Direct sun drying, Hot water blanching, Oven heating, Or Freezing.

* **Sweating / Curing**

The pods are boiled and held at 45-60C, for 7-10 days in cloth covered containers. This initiates the curing process by enzyme action.

* **Drying / Curing**

The next stage of the curing process is drying in subdued sunlight or even shade with strong air-movement. This may take weeks. When the maximum aroma development has been reached (loss of about 60-70% of original moisture content), the curing process is complete.

* **Grading**

The pods are sorted out and graded according to aroma, size, and quality, and particular market demands.



Vanilla vine

There are a few simple guidelines for the selection and grading of vanilla beans. Premium beans from whatever origin always bear a rich aroma, and are oily looking. Stale and brittle beans are generally devoid of the rich characteristic aroma of the premium quality beans.

The beans known by the trade as Bourbon beans, are long and slender with a rich brown colour. They have a strong aroma and a leathery, shiny skin. Inside the pods there are an abundance of the tiny speck-like seeds. Bourbon beans from Madagascar and the Comoros are described as having, " a strong aroma of vanilla, bearing a creamy hay-like and sweet overtones".

Mexican beans are considered by the trade to be very similar to Bourbon beans, while possessing "a more mellow, smooth quality and a spicy woody fragrance."

Tahitian beans which are derived from *Vanilla tahitiensis*, are stouter in shape and contain a higher moisture and oil content. They contain fewer seeds, and the pod casing is thinner. Their aroma is described in the trade as "fruity and floral, with the overtones of cherries, liquorice, prunes or wines".

PRODUCTS FROM THE VANILLA POD

The main products from the vanilla pod are:

- * The whole pods after curing and drying
- * Powdered (ground) pods, pure or with sugar or starch.
- * Extract of vanilla - in aqueous alcoholic solution
- * Vanillin powder

Synthetic vanilla is also used in the Food and Beverages industry but the natural vanilla which is superior is generally preferred. Natural vanilla is however vastly more expensive. A common adulterant for vanilla is the chemical coumarin which is a constituent of the Tonka Bean. But the toxic nature of coumarin, prevents its usage in foods.

Vanilla beans once cured and dried will keep almost indefinitely if stored under cool dry conditions. In warm tropical conditions they may best be wrapped in waxed paper and stored in a plastic box. Bourbon beans may, sometimes on storage, develop a "givre", which is a frosting of natural crystals of the constituent vanillin which seeps out of the pod. This is indicative of a good quality bean with a high content of the natural

vanillin. This givre need not be mistaken for mildew. On exposing them to direct sunlight they will reflect the light in the manner of true crystalline substances.

Vanilla beans ground, or comminuted to a fine powder, are a valuable product from the industrial viewpoint. They are better incorporated into large scale bakery products.

Another similar product is the powdered vanilla which is actually an extract of vanilla ribbon sprayed onto a carrier such as sucrose.

It is recorded that there are over 150 varieties of vanilla. Of these only two types are commercially identified, namely Bourbon, and Tahitian.

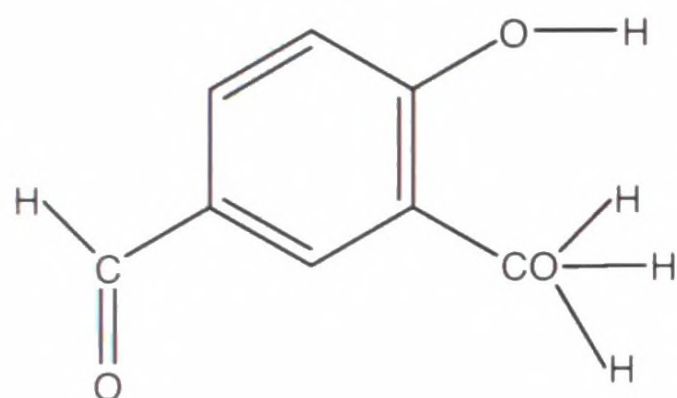
Vanilla extracts are traditionally made by percolating or macerating chopped vanilla beans with food grade ethyl alcohol and water. (A 35-40% mixture is recommended.) The temperatures are not allowed to rise beyond low ambient levels, ie. (18-28 C.), in order to preserve the high volatile aroma components. Some manufacturers believe that heat is needed to gain complete extraction. A time frame of 40-60 hours is generally needed for complete flavour extraction, and after this the extract is allowed to season together with the beans for sometimes weeks. The extract is then filtered into a storage vessel, in which the bulk amber coloured liquid remains for bottling. Modern methodology depends on percolating the macerated beans with the aqueous alcoholic mixture to obtain a saturated extract.

Vanilla extracts will continue to develop body and depth for about two years after which they stabilize at complete seasoned maturity. They will keep indefinitely if stored in a cool dark place. Refrigeration of the extracts are not needed, as the vanillin may crystallize.

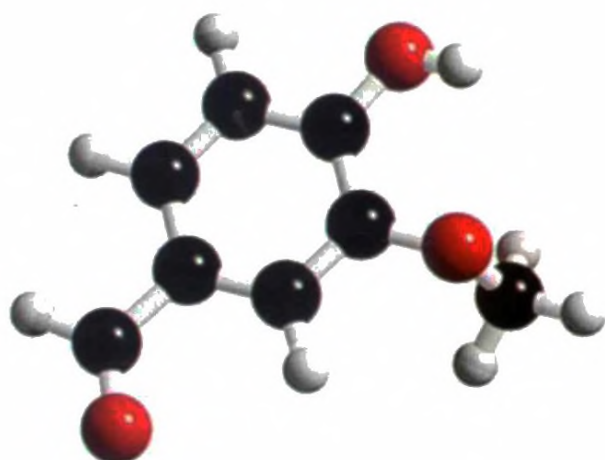


CHEMISTRY

The cured vanilla pods have a large variety of compounds within them. However, the main aroma-giving compounds are Vanillin, which is: 4-hydroxy-3-methoxy-benzaldehyde. (I), and ethyl vanillin, 4-hydroxy-3-ethoxybenzaldehyde. Detailed studies on the chemistry of vanilla, revealed the presence of over 250 compounds, albeit some of them, in only trace quantities. All of these presumably combine to give vanilla its unique flavour. Ethyl vanillin is stronger in aroma than vanillin itself but the overall flavour of an extract of natural vanillin combines the effect of all of the compounds present in the cured pods.



Chemical structure of VANILLIN.



Molecular model of VANILLIN

USES

Although the Aztecs used vanilla both as a flavouring agent as a medicine today only the former use prevails. Flavouring of foods is achieved by the use of any of its various products, as well as by the use of cheaper synthetic substitutes. The widest use of vanilla is in the flavouring of ice-creams, and bakery products. Vanilla ice-cream is the most popular flavour.

The perfumery and fragrance industry also uses vanilla in a very pure form. Many cosmetic products made with natural vanilla are popular and are also used by aromatherapists. In the old European medical literature vanilla is described as an aphrodisiac, and a remedy for fevers. These have not been scientifically established.

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Did you know?

Globalisation in the 19th Century was the Prelude to Modernity.

From 1815 to 1914, the key feature was the development of the Global market in subsistence goods, instead of luxury items, and this was symbolised by the poem by Britain' poet laureate John Masefield "Cargoes" , which runs as follows:

*Quinquireme of Nineveh from distant Ophir,
Rowing home to haven in sunny Palastine,
With a cargo of ivory, And apes and peacocks,
Sandalwood, cedarwood, and sweet white wine.*

*Stately Spanish galleon coming from the Isthmus,
Dipping through the Tropics by the palm green shores,
With a cargo of diamonds, emeralds and amethysts,
Topazes, cinnamon, and gold moidores.*

*Dirty British coaster with a salt caked smoke stack,
Butting through the channel in the mad March days,
With a cargo of Tyne coal, Road rails, pig-lead,
Firewood, iron-ware, and cheap tin trays.*