

PLANTS USED FOR THE PRODUCTION OF BEVERAGES

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Summary

Herbs and spices play a significant part in the production of beverages and have been used for many centuries. Some of them were already in use in prehistory (cinnamon, hops, marjoram, etc.).

At presents hundreds of plants are used in the production of beverages for flavoring and coloring purposes. We have tried to review the most important ones.

Herbs and spices can be applied separately or in groups for achieving the desired flavor. The plants are normally used in the form of abstracts or extracts.

1. Introduction

In this article we review the plants (seasonings of vegetable origin) which are used in the production of alcoholic (spirits, beer) and non-alcoholic beverages.

2. The importance of spices and herbs in the production of beverages

Spices and herbs are seasonings of plant origin that are necessary for the production of beverages.

Herbs are flowering or sterile plants that are partly or wholly used in cooking and medicines because of their content of particular chemical compounds. Dried herbs containing chemical agents are called drugs. Spices in general are products of mostly plant origin that are used for the seasoning, flavoring or perhaps preserving of foods, food-products and beverages. No distinction is made between herbs and spices in terms of the production of beverages (see Table 1).

Flavor		Typical representative
Strongly flavored drugs without any special bitter taste		Cumin seed
Flavored drugs	Sweet	Anise seed
	Vanilla	Vanilla
	Bitter almond flavor	“Bitter” almond
	Sharply hot flavor	Cinnamon
Slightly flavored drugs	Bitter	Orange peel
	Without any special bitter taste	Coffee bean
Most bitter drugs		Cassia
Spices		Allspice

Table 1. Groups of herbs and spices based on agents (drugs)

3. Plants used for the production of beverages

3.1. Allspice (*Pimenta officinalis*)

This popular spice is used both whole and ground. It is used in the kitchen for flavoring foods, beverages, etc. It is employed by food manufacturers in the preparation of many meats, sauces, etc. Whole allspice fruits are an ingredient of whole Mixed Pickling Spice, and ground allspice is a constituent of a number of spice mixtures including curry powder, pastry spice, etc.

The aroma is very fragrant, similar to cloves, and the pungent aromatic flavor suggests a blend of cinnamon, clove, nutmeg and pepper; hence the name ‘allspice’. The leaves of the allspice tree are just as aromatic as the fruits and are used in the preparation of essential oils and oleoresins.

Allspice from Jamaica contains up to 4.5% volatile oil, consisting of up to 80% eugenol and nearly 30 other chemical components like methyl ether, cineol, phellandrene, caryophyllene, resins, tannin, fixed oils, and gum. Allspice from elsewhere yields only half as much essential oil and is of a poorer quality.

Allspice from USA contains not less than 5% total ash, 0.3% acid insoluble ash, 10% moisture, and not less than 3 cm³ of volatile oil per 100 g.

Whole or ground allspice is used to flavor vegetables. Ground allspice made by dispersing the oil of *Pimenta* leaf, or made from allspice berries on an inert edible base, is used as a component of prepared meats, sauce, etc.

Pimenta leaf oil is also used to flavor liqueurs, non-alcoholic beverages, perfumery and medicines.

Allspice is cultivated mostly on the island of Jamaica, and in Guatemala, Honduras, and Mexico.

The allspice tree is erect with numerous branches, and reaches a height of 6 to 7.5 meters. The trees begin to bear fruit in commercial quantities when they are about seven years old and their productivity increases yearly for about another twelve years. The dried allspice berry is nearly globular in shape, and the berries vary in size from about 0.1 to 0.7 cm diameter. The leaves are oval in shape from 12 to 24 cm long, and deep green.

3.2. Anise (*Pimpinella anisum*)

Anise seed, like most herbs and spices can be used in several dishes. The leaves may be used as a garnish or in salads and for flavoring soups and meat dishes.

Anise seed contains from 8-11% fixed oil and 2-5% essential oil. The essential oil does not contain less than 80% anethol (see Figure 1). It is used in the beverage industry for flavoring liqueurs, like Absinthe.

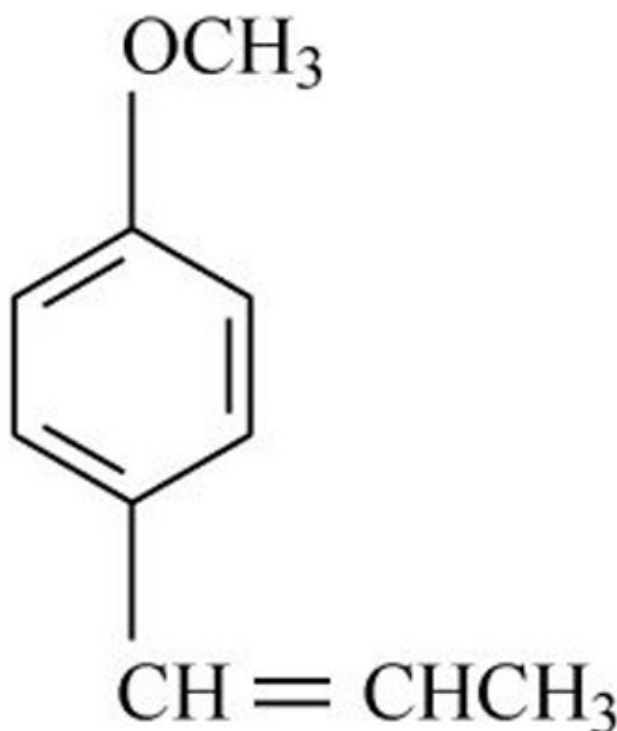


Figure 1. Anethol

The oleoresin of anise seed is a yellowish green to orange colored liquid of good aroma and flavor. The volatile oil content ranges from 15 to 18 cm³ per 100 g. Anise is indigenous to Egypt, Greece, Lebanon, and Turkey.

It was used as a flavoring in Egypt as early as 1500 BC. It is now cultivated in South America (Argentina, Chile, Mexico), North America (USA.) in Europe (France, Germany, Greece, Russia, Bulgaria, Hungary), and in other countries (India, Pakistan, Syria, Japan, etc.).

The anise plants attain a height of 35 to 70 cm, and have an erect branching stem. The leaves vary in shape from broadly triangular, cleft and irregularly toothed at the base of the plant, to narrow segments in the upper part.

The flowers are small, white and borne in compound terminal umbels. The fruit consists of two united carpels, each carpel containing a single seed. Anise requires a warm temperature and good soil.

3.3. Cassia (*Cinnamomum cassia*)

Ground cassia cinnamon (i.e. the bark) is employed to flavor foods, and cracked cassia cinnamon is an ingredient of whole mixed pickling spice. The bark contains chemical substances (quasiin), which give it a bitter aroma and taste. For this reason it is used in the beverage industry for flavoring liqueurs, and bitters.

Cassia is indigenous to China, Indonesia, Vietnam, Laos, and Sumatra. Ancient religious believers in China regarded the Cassia tree as a Tree of Life.

When the trees are ready to yield they are cut down. The young shoots of the cassia tree are cut and the bark peeled twice a year. The bark is rolled into quills. Chinese cassia quills are over 25 to 40 cm long and 2 to 6 mm thick. Cassia from Vietnam is over 30 cm long and 5 mm thick.

The oil in the buds contains cinnamic aldehyde, as well as a fixed oil, proteins, cellulose, starch, pentosan and minerals. Cassia buds possess a slight cinnamon-like aroma, and a sweet, warm pungent taste similar to that of cassia cinnamon.

3.4. Cinnamon (*Cinnamomum sp.*)

Cinnamon is one of the oldest spices. It is used in the kitchen for flavoring foods, sauces, beverages, etc. Ground cinnamon bark is employed by manufacturers in the preparation of many foods, sauces, cream soups, beverages, etc. Extracts of cinnamon are also used in the pharmaceutical trade (see Figure 2).

The composition of cinnamon is 5-6% total ash, 2% acid insoluble ash, 10-11% moisture, and 1.25 to 3.0 cm³ volatile oil per 100 g. Cinnamonic aldehyde makes up 65 to 75% of the oil's components. Under cultivation, the tree is cut back to no more than 2 to 4 m to encourage the growth of numerous shoots.

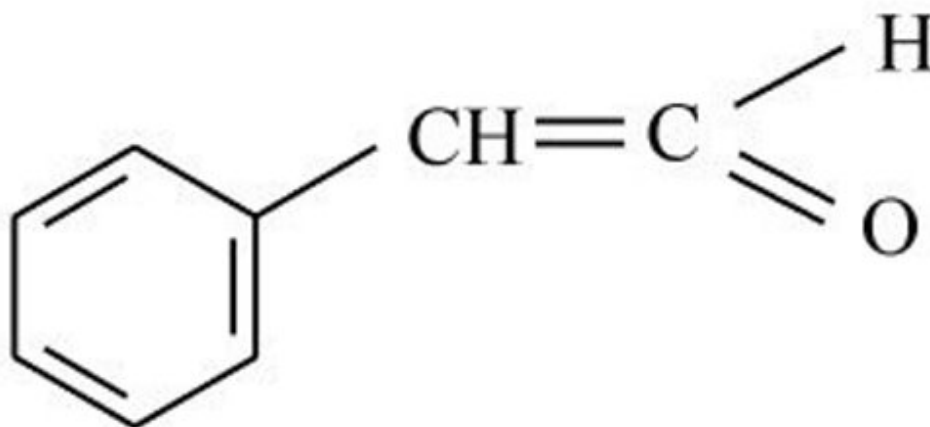


Figure 2. Cinnamic aldehyde

The plant can be propagated from cutting, usually in July or August. The bark is more easily separated from the wood following the first rains of the season. The quills may be as long as one meter, one centimeter in diameter and 0.5 mm thick.

The broken quills vary in length from 5 to 20 cm. Freshly ground cinnamon bark of good quality contains 0.9 to 2.5% essential oil, depending on the variety.

Cinnamon is indigenous to the hot, moist climate of Sri Lanka, which still maintains 70% or more of the world market, followed by India, Sumatra, and Borneo.

Today cinnamon is also cultivated in China, Java, Sumatra, Africa, South America and Mexico. It was sought for embalming by the Egyptians over 3000 years ago.

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Biographical Sketch

Dr. Ferenc Geza Pandi was born in Budapest, Hungary, in 1941. A married man, he currently works at the Gyor Distillery & Refinery Co. Ltd, in Gyor. He has an MSc. in Food Engineering (1965, Moscow), an MSc. in Bio-Engineering (1973, Budapest) and a PhD in Biochemistry (1979, Budapest). His employment history is as follows:

1966-1971. Head of Central Laboratory of National Alcohol Industry, Budapest

1971-1978. Head of the Quality Assurance Department of the Alcohol Research Institute, Budapest

1978-1983. Deputy Director for the Trust of National Alcohol Industry, Budapest

1983-1990. Deputy Director of the Alcohol Research and Quality Assurance Institute, Budapest

1990-1997. Director of the Alcohol R. and Quality Assurance Institute, Budapest

1997-2000. Expert for the Ministry of Agriculture and Regional Development, Budapest

2000-2002. Head of Environmental Protection Department of the Central Food Research Institute, Budapest.

2002-present. Technical and economical consultant of the Győr Distillery & Refinery Co. Ltd., Győr.

From 1992 to 1996 he was an Invited Associate Professor at the Department of Food Machines and Equipment, University of Horticulture and Food Industry, Szeged, Hungary.

He has had wide experience in food technology and science, with special expertise in food quality control and standardisation. He was heavily involved in preparing the Hungarian Codex Alimentarius and Food Law. He is the author of over 60 scientific papers and 15 books, and book chapters.

Society membership:

1990 - present. Member of the Food Complex Committee of the Hungarian Academy of Science.

2000 - present. President of the Environmental Protection Committee at the Federation of Technical and Scientific Societies of Food Industry