

SOCIO-ECONOMIC
IMPACT STUDY OF THE NATURALS

BERGAMOT OIL

This report on bergamot oil is the twelfth in a series of reports being produced by the IFEAT Socio-Economic Sub-Committee on the importance of specific naturals to the livelihoods of those involved in their production. This report, along with all the previous socio-economic reports, can be found on the IFEAT website, under the tab "Publications".

COMMON NAME – BERGAMOT – CITRUS BERGAMIA RISSO ET POIT

INTRODUCTION:

Bergamot, which is a hybrid between a bitter orange and a lemon, was most probably crafted for ornamental purposes during the Arab occupation of Sicily between the 8th and late 12th centuries.

The bergamot has been known in the Mediterranean for several centuries, the distinctive and desirable characteristics of its oil having been recognised as early as 1750. It is assumed that it originated as a seedling in southern Italy and therefore it may be of interest to note that the distinctive aroma of bergamot oil occurs also in the limettas (C. limetta Risso) of the Mediterranean basin – they are sometimes incorrectly referred to as bergamots.

For reasons that are not clear, this fruit is commercially-grown primarily for the rind oil and is mostly confined to the province of Calabria in southern Italy. Historically, the planting areas were just over 3,000 hectares. While the tree grows and bears well in Sicily and in portions of North Africa and elsewhere, it is reported that the oil is highly variable, inferior in quality, and therefore unprofitable.

Bergamot oil is commercially important because it constitutes the base of cologne water (eau de cologne), perhaps the most widely used toilet water, and also has other perfumery uses. According to Chapot (1962b), this cologne water was developed in Cologne in 1676 by an Italian, Paolo Feminis, and it was commercialised by his son-in-law, Gian Maria Farina. Its manufacture dates back to 1709. Bergamot petitgrain oil is another product of minor importance, distilled from the leaves and young growth of the plant.

Today, bergamot is a key ingredient and game changer in more than 50% of all fine fragrances worldwide, and Earl Grey tea is of course flavoured with bergamot. Nowadays, new extraction methods are used for pharmaceutical applications and the antioxidant properties of the fruit and its components are becoming increasingly popular.

The main growing areas worldwide are:

- **Italy (Calabria):** makes up around 90% of total production today
- **Ivory Coast:** used to be an alternative source but in recent years, production has decreased drastically
- **Brazil:** some recent initiatives are taking place to develop the production.

PRODUCTION AND PROCESSING CHARACTERISTICS:

In Calabria, bergamot groves can be found on a 140km stretch of land beginning in Reggio di Calabria, heading South and following the Ionian Coast. Over 1,400 hectares are planted and are managed through several Cooperatives and Growers' Associations, and a further 450 ha are being planted. Due to historical reasons (former latifundism) and land shape (relatively narrow coastal plains), the total number of hectares continued to decrease until more recently. The average size of 50% of all plantations is rather small (2 ha), and the largest hardly exceed 20 ha.

There are three different varieties of bergamot fruits that are traditionally

grown, namely Feminello, Fantastico and Castagnaro.

Being situated in the Northern Hemisphere, the crop is taken in winter (December to February) and a good crop is considered to be one that delivers around 120 metric tons of crude oil.

Processing of the fruits is mechanical and is done using traditional cold press systems (mainly Pelatrice extractors).

A clear liquid, varying in color from green to greenish yellow, bergamot essential oil consists for the most part (average 95%) of a volatile fraction and for the remaining part (5%) of a non-volatile fraction (or residual).

Chemically, it is a highly complex mixture of many classes of organic substances,

particularly for the volatile fractions; terpenes, esters, alcohols and aldehydes, and for the non-volatile fractions, such as oxygenated heterocyclic compounds, as well as coumarins and furanocoumarins.

In recent times, other applications and properties of the product have been explored.

In 2015, 35,000 kg per week was distributed to Italian supermarkets as fresh fruit and it was also distributed in Spain, the UK and Switzerland. The consumption of the fruit was advertised as the means to reduce and control so-called bad cholesterol levels.

SOCIAL AND ECONOMIC CHARACTERISTICS:

Bergamot production stands as an important source of revenue for local agriculture, and for the 4,500 families involved in its production cycle. Today, thanks to an ambitious policy, the bergamot supply chain (including all stakeholders, from farm to University, processors and users) is on its way to achieving a full sustainable profile and its resilience factor is highly positive.

Recent statistics reflect that production of bergamot has increased by 11% in recent years.

According to a study conducted by the University of Magna Grecia and the International Fragrance Association, together with Reggio Calabria University and the Bergamot Consortio, 83% of the growers are ready to expand their activity, planting more trees to improve production.

Impact Category:

High impact, many people involved.

Relevant site location:

Italy. Bergamot is grown only in a small area of Calabria where just over 1,400 hectares of planted fields produce almost 90% of the world's total bergamot crop.

Production is concentrated north to south of Reggio Calabria Province covering the foothill area by the Ionian Sea at the southern end of the Italian Peninsula.

Farmed or foraged:

Farmed.

Harvest timing:

The bergamot harvest starts from mid to late November/early December and can last until the end of February/early March.

Location of processing:

Farm/district level. Historically, the so-called "machine calabrisi" was used for the production of essence of bergamot, where fruits were peeled eight at a time. Today the oil is extracted with machines called "peelers" which allow the oil yield to stabilise at a favourable level. These machines scrape the outside of the fruit under running water to get an emulsion which is channelled into centrifuges for separating the essence from the water.

Distinguishing characteristics:

It is estimated that from the bergamot under cultivation, approximately 25,000 metric tons of fresh fruit are produced. With 1kg of oil being obtained from 200kg of fruit, the current production is calculated at 125 metric tons per year. Around 20% of the total cultivated area is represented by family fields with less than two hectares, while 25% have two to five hectares, 25% have five to ten hectares, and 25% have more than ten hectares. A key factor that helps many farmers is that bergamot trees do not need particular care, except irrigation during summer and pruning every two to three years. They are long-lasting trees and it is common to find trees more than 50-years-old. (Arrigo, 2011)

During the past 10 years the sales of organic materials rose up significantly and the trend is still increasing.

Volumes:

Italy is the world's largest producer of bergamot oil. With a production in 2008/2009 of 70 metric tons, and current production estimated at around 125 metric tons. The contribution of bergamot oil to the export of Italian essential oils is higher than 3%. (Arrigo, 2011; IFEAT, 2009)

CONCLUSIONS:

Matching the growing global awareness and interest in naturals, the bergamot supply chain offers a highly resilient and sustainable source for a sound and safe development of its usage in F&F, and in new pharmaceutical applications.

REFERENCES

- Arrigo, A., 2011. Bergamot – A Resilient Citrus. In: IFEAT International Conference 2011. Barcelona, Spain 6 – 10 November 2011. London: IFEAT.
- Bredenberg, K., 2004. An overview of trends in citrus oil production in the countries bordering the Mediterranean. In: IFEAT International Conference 2004. Lisbon, Portugal October 2004. London: IFEAT.
- Chapot, H. 1948. Mission au Maroc. Inst. des Fruits et Agrumes Coloniaux [Paris]. Rap. Ann. 1962. Le bergamotier. Al Awamia [Rabat] 5: 1-27.
- IFEAT, 2009. IFEAT Study Tour of Italy February 22 – 27 2009 Final Report. London: IFEAT.
- ISO 3520:1998. Oil of bergamot [Citrus aurantium L. subsp. bergamia (Wight et Arnott) Engler], Italian type.
- ISO 4720:2009. Essential oils. Nomenclature.
- Stracuzzi, A., 2004. The Italian Citrus Industry. In: IFEAT International Conference 2004. Lisbon, Portugal October 2004. London: IFEAT.
- The Economist Online, 2010. Bergamot. The sweet smell of Christmas. 23rd December 2010. Accessed from: <http://www.economist.com/blogs/newsbook/2010/12/bergamot>

PELATRICE
Peeling machine



DECANTING
Bergamot oil

