AGARWOOD

Aquilaria spp.

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L'INFINI VEGETAL

DESCRIPTION AND HABITAT

The **Aquilaria** genus belongs to the Thymelaeaceae family and includes 15 species that are distributed across South-east Asia (Indonesia, Malaysia, Vietnam, Cambodia, Thailand, Laos and Papua New Guinea). They are trees that reach 6-20 m in height and they have evolved to survive in various habitats, including the rainforest, sandy or calcareous areas, well-drained hillsides and mountain ranges, and areas close to swamps. They grow at altitudes ranging from 0-1000 m[6].

Agarwood (*gaharu*, *eaglewood*, *aloeswood, agalloch, jin-koh, oudh* or *oud, gahoru candan, chen xiang, mai kritsana* and *tram huong*) is a **dark-coloured resin that permeates the wood of trees from the *Aquilaria* genus**, which produce this resin as a defensive response to a bacterial or fungal infection caused after being wounded[2-4]. Different species of fungi have been identified that can colonise wounds in the trunks of Aquilaria: *Aspergillus* sp., *Fusarium* sp. or *Peniciiiium* sp.[5].

Agarwood has a high content of **volatile components**, a high economic value and is much appreciated by the producers of perfumes, cosmetics and fragrances. It is one of the most valuable non-wood forest products from the Asian rainforest[6-7] and in countries like Indonesia it is thought to have been traded for 1,500 years[6]. Due to its commercial value, the mass harvesting of the different species of Aquilaria carried out by companies unconnected to the native populations has caused a decline in its population[5] and currently the following species can be found on the red list of threatened species produced by the IUCN[8]: *Aquilaria banaensae* (vulnerable), *Aquilaria beccariana* (vulnerable), *Aquilaria crassna* (critically endangered), *Aquilaria cumingiana* (vulnerable), *Aquilaria hirta* (vulnerable), *Aquilaria malaccensis* (Vulnerable), *Aquilaria microcarpa* (vulnerable), *Aquilaria rostrata* (critically endangered) and *Aquilaria slnensis* (vulnerable).




In order to exploit this **resource in a sustainable way**, one that is respectful to the environment, Professor Blanchette from the University of Minnesota has developed a kit so that native farmers can inoculate the trees with the fungi responsible for producing this resin[9]: once the trees are 5 years old, the cultivation of agarwood can begin. The system involves making a hole in the tree and inoculating it with a compound that attracts micro-organisms. This attack induces the formation of the resin as a defensive measure and this can be collected two years later. This project is very interesting because it will allow the inhabitants of these regions to develop economically.

TRADITION AND CULTURE

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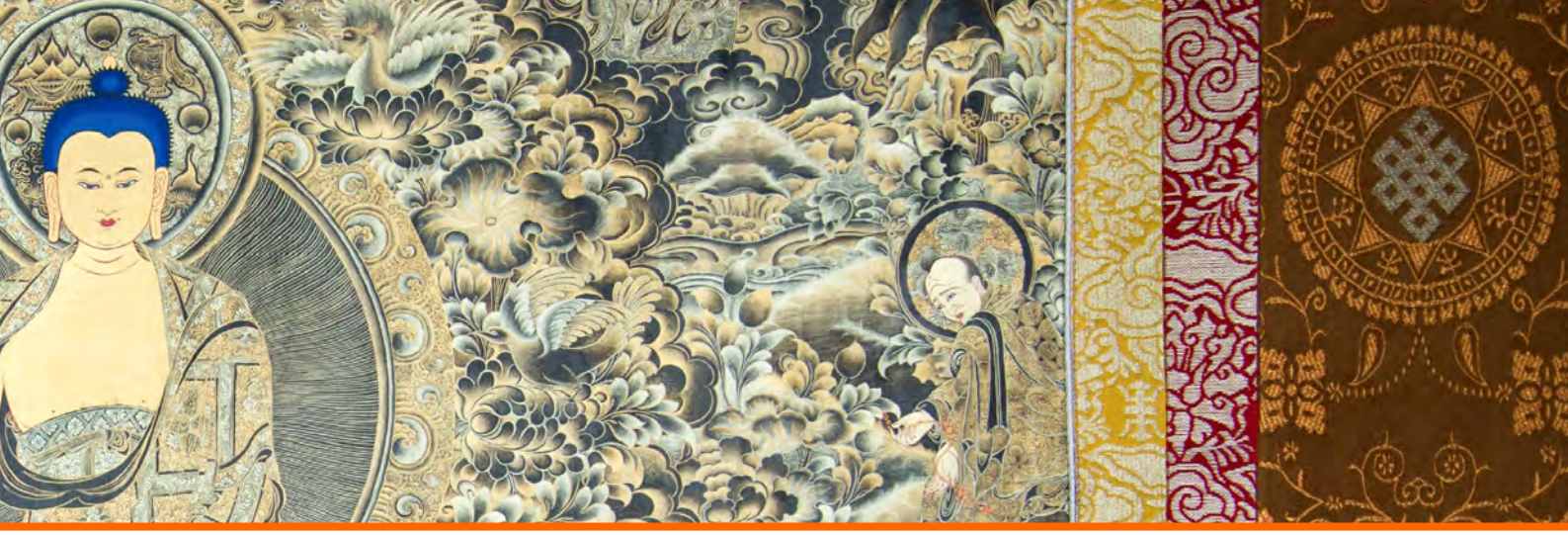

Both the resin and the essential oils are used in incense for **religious ceremonies** [2,4,7]), an **ornament** in China and in **Oriental medicine**([5-10]. The Egyptians also used it as part of their funeral rituals over 3000 years ago[2]), and in the Old Testament it is quoted under the name of *aloe* or *ahaloth*[5]. The *Aquilaria agallocha* (*Oudh, Oud* (Arabia), *gaharu candan* (Malaysia), *eaglewood, chen xiang* (China), *jin-koh* (Japan), *mai kritsana* (Thailand), and *tram huong* (Vietnam) species have an important religious value: they are used in the Muslim religion, the Catholic religion (appearing in the Bible described as a perfumed wood) and in Tibetan Buddhism where they are used as an offering to the Gods[4]. In Tibet it is used to manufacture the "Buddhist Mala" rosary prayer beads that consists of 108 beads of the same size.

In Japan, agarwood is used in funeral rituals and in *Koh-do*, a game that takes place during the incense ritual. It involves burning different types of wood and guessing the species it belongs to using the sense of smell. In *Koh-do*, the agarwood fragrance is classified as *go-mi ríkkoku* (six countries, five flavours[11]).

PERFUMERY

Agarwood essential oils are highly appreciated in **perfumery**. Their scent has a hint of animal and is reminiscent of leather as well as providing strength and power for oriental perfumes. For Muslims, it is the **smell of paradise** and is associated with a high social status.

MEDICINAL PROPERTIES

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The oil from these species is used in traditional Chinese and Korean medicine for the preparation of medicinal wine and other products[2]. In oriental medicine it has been used to help with **pain and asthmatic** and **digestive problems**. It is also known to be used as a **sedative**[7-12] when used in incense[13]. Additionally, the uninfected wood also has its uses, as the Malaysians use it to treat body pain and jaundice[4].

Agarwood powder is used in Chinese medicine and pharmaceutical dyes. It has also been described as being mixed with coconut oil for use as a liniment and in broth (*concoction*) for treating **rheumatism**.

Other medicinal uses of agarwood are: as a carminative in cases of dropsy (fluid retention in the tissues), for diseases in the female genital organs and as a tonic during pregnancy[4].

CHEMICAL COMPOSITION

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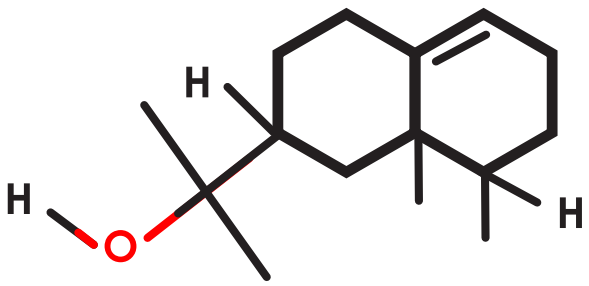
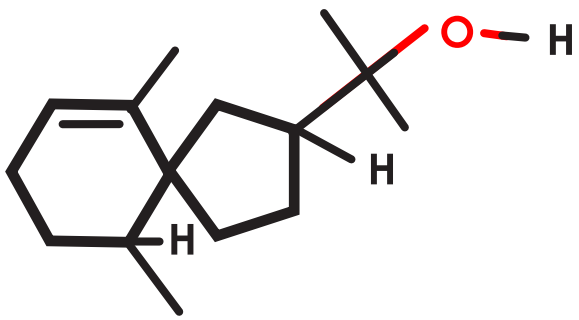
Among the **compounds** that make up agarwood, the group of **sesquiterpenes** should be mentioned for their biological activity[12]. The study conducted by Ueda and its collaborators[7] allowed a new sesquiterpenoid to be isolated in a high quality agarwood from Vietnam (*Tram*), which acts on the **central nervous system**.

The *Aquilaria malaccensis* agarwood, used in incense for **meditation and sedation**, contains the jinkoh-eremol and agarospirol sesquiterpenoids which have been used as pain relievers in previous pharmacological studies and may have an anti-psychotic effect[13].



JINKOH-EREMOL



AGAROSPIROL

THE QUALITY OF AGARWOOD

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The quality of agarwood is mainly based on its resin content. The shape, colour, form and intensity of the aroma must also be taken into account. At the HÉVÉA laboratory we have conducted a classification based on the colour of the material, and the most valuable are those with a darker colour because they possess a higher resin content.

Classification of the colour of agarwood;
the darker pieces are more valuable.

How to use Agarwood

The essential oil is mainly used in perfumery. In diffusion, a drop is added to the diffuser's upper container [aroma burner], with water, and it is heated thanks to the candle located at the bottom of the diffuser. The aim is for the water to warm gradually which helps the diffusion of the volatile compounds.

For the wood, fumigation is performed in the following way: a charcoal ember is placed in the upper container of the diffuser [aroma burner] and on top of this is a mica plate onto which the agarwood is placed, thereby preventing it coming into direct contact with the charcoal.

Essential Oil
Agarwood
Essential oil available from HÉVÉA

Essential Oil Diffuser
Aroma Burner of natural stone
designed by ENO STUDIO™

HÉVÉA LABORATORY

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In the region of Perak, in the north of Malaysia, the inhabitants of the indigenous town Orang Asli live off the natural resources offered by the forest. For the harvesting of agarwood it is necessary to go deep into the forest for several days and once the trees have been selected they only harvest the infected or dead parts so that it is a sustainable practice that does not result in the loss of this precious resource.

The **HÉVÉA Laboratory team** made an expedition to this area in order to understand and treat the raw material from the beginning until the final product is obtained. Our philosophy is to support **sustainable development**, so in collaboration with a Malaysian company agarwood has been obtained from trees inoculated with the fungi that induces the formation of this resin, allowing for a more controlled harvest.

The HÉVÉA Laboratory team with Orang Asli inhabitants harvesting agarwood.

The HÉVÉA Laboratory team in the plantation where the fungus inoculations were performed.

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