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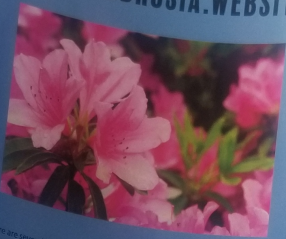
INFORMATIONAL BROCHURE
ON PLANT SCIENCE AND EXTRACTION
OF PLANT RESINS.



- various types of plant resin extraction
- Distillation
 - Cold Pressing
 - Solvent Extraction
 - High Pressure Co2 Extraction

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There are several extraction methods for making resins and extracts from plants, and each will be discussed briefly below. Some plants contain alkaloids as part of their chemical composition, and these different alkaloids will extract into different solvents.

For example, Blue Lotus contains alkaloids that will only extract into alcohol, whereas *Dianthus barbatus* contains an alkaloid that will extract into water, but will be destroyed by alcohol. When doing resin extractions from plants, it is important to know which chemical compounds will extract into what solvents.

Steam Distillation
Used mainly to extract essential oils from plants. The plant material is placed into a still (very similar to a pressure cooker) and prepared steam passes through the plant material. The heat from the steam causes the volatile oils in the plant to evaporate and rise above the water. The essential oil vapor rises faster than the water vapor, and the two vapors are condensed back to liquid. At this point, the mixture separates from the water and floats to the top.

Cold Pressing
Used primarily to extract the essential oils from citrus fruits such as orange, lemon, grapefruit and bergamot. The fruit is squeezed from the fruit, or ground or chopped and are then pressed. The result is a watery mixture of essential oil and water which will separate given time. It is important to note that oils extracted using this method have a relatively short shelf life, or may be purchased only what you will be using within the next six months.

Solvent Extraction
A hydrocarbon solvent is added to the plant material to help dissolve the essential oil. When the solution is filtered and concentrated by distillation, a substance containing pure (or nearly) essential oil is produced. A combination of heat and essential oil evaporation, the oil is left behind.

High Pressure CO2 Extraction
A recently developed, this method uses CO2 under high pressure to extract oils, or resin from the plant. The CO2 is then expanded and the oil or resin is left behind. This method is a gasous state, and only pure essential oils or resins remain. This is a very advanced technology, and is not yet available to the general public. An example of this is the extraction of hops for beer brewing.

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Condensed resin from which the volatile terpenes have been removed by distillation is known as resin. Typical resin is a transparent or translucent mass, with a vitreous fracture and a faintly yellow or brown colour, non-odorous or having only a slight resinous odor and taste. Resin is insoluble in water, mostly soluble in alcohol, essential oils, ether, and hot fatty oils. Resin softens and melts under the influence of heat. Resin burns with a bright but smoky flame.

Resin consists of a complex mixture of different substances including organic acids, which are named the resin acids. Related to the terpenes, resin acids are oxidized terpenes. Resin acids dissolved in alkalis to form resin soaps, from which the purified resin acids are regenerated upon treatment with acids. Examples of resin acids are abietic acid (lytic acid), C₂₀H₃₀O₂, pimaric acid contained in cedar, and pimaric acid, C₂₀H₃₀O₂, a constituent of galipot resin. Abietic acid resembles abietic acid into which it passes when distilled in a vacuum; it has been supposed to consist of three isomers.

Resins are obtained from pines and some other plants, mostly conifers. [5] Plant resins are generally produced as stem secretions, but in some Central and South American species such as *Euphorbia ciliolobata* and *Cassia* species they are produced as pollination rewards, and used by some stingless bee species to construct their nests. [6] Propolis, consisting largely of resins collected from plants such as poplars and conifers, is used by honey bees to seal small gaps in their hives, while larger gaps are filled with beeswax. [8]

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