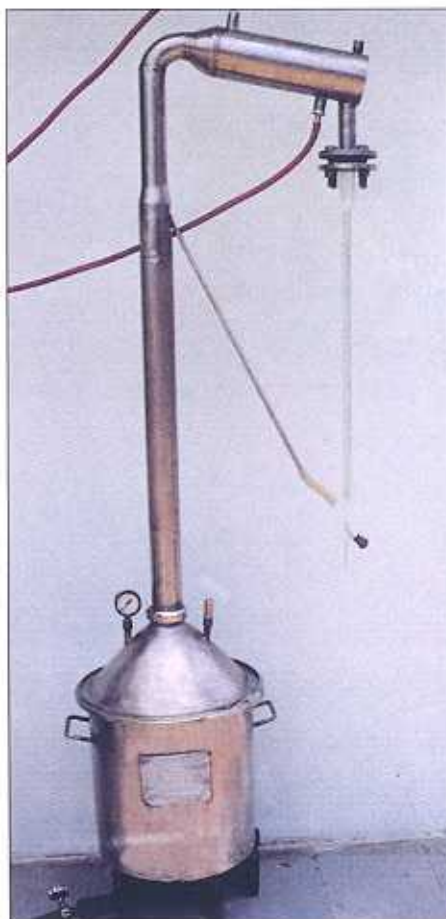




Mini Essential Oil Distillation Apparatus

Designed and developed by

Institute of Himalayan Bioresource Technology, Palampur
(Council of Scientific & Industrial Research)



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Mini Essential Oil Distillation Apparatus

From times immemorial people use flowers and other sweet smelling natural products as perfume, fragrance and flavours derived from plant materials. These flowers and fragrant plants have been used on auspicious occasions and religious ceremonies since ancient times. A large number of aromatic plants utilised from wild sources are cultivated for commercial use by the farmers. This forms the base for essential oil industry. For setting up an essential oil industry it needs planting material and the distillation facility.

It may be a slow learning process for a new entrepreneur to acquire sufficient knowledge in distillation of essential oils but learning while doing is the best policy and level of production and quantum of business will depend on available resources.

What are essential oils?

Essential oils are odoriferous volatile products obtained from natural sources. These are found in all parts of the plant and termed as essential oils because they represent the essence of odour and flavour. These are generally used in perfumes, cosmetics and in aromatherapy. Each essential oil is a complex mixture of many compounds and in some cases it is more than 250 single compounds. These are obtained by distillation using either steam, steam with water or by water distillation. Other processes such as cold pressing and maceration are also used for extraction of essential oils.

Essential oils are obtained from different plant parts such as flowers, leaves, seeds, stems, roots, bark and fruits. These are distilled worldwide in small and large scale distillation units. Hobbyists and specialists growing essential oil bearing plants of commercial importance can become producers of these oils with the help of household mini essential oil distillation apparatus developed by the **Institute of Himalayan Bioresource Technology, Palampur(HP)**, which can lead them to produce essential oils at miniature scale for aromatherapy and other purposes.

Essential oil distillation units involve high capital investment and small growers can not afford at the beginning, Our indigenously designed low cost apparatus has broken the barriers of high initial capital investment in the area of new agricultural production system at small scale. This apparatus designed by our Institute meets the requirement of small growers, educational institutes and entrepreneurs in the field of aromatherapy who wish to start essential oil distillation at small scale and to learn art, skill and science of production technology.

Application and use

This newly designed unit finds application in

- (i) Training and education.
- (ii) Employment and income generation.
- (iii) Household cottage industry for marginal farmers and housewives.
- (iv) Hobbyists for producing essential oils and perfumed waters like rose water, ajowain and basil water on small scale.

Operation procedure

Adjust the false bottom by rotating, as required, before placing the still on the furnace/stove burner. Charge the vessel with plant material along with sufficient water. Now cover the whole system with lid by tightening the union after ensuring the proper setting of the gasket. Fix the whole attachment above the still by tightening the clamp. Give the water connection from tap to the condenser through a rubber tube. Fill the shell side of the condenser with water. Fill the oil retention glass tube with water through air vent at the rear end of the condenser till water starts flowing into the cohobation column. Start heating main vessel. Ensure water supply to the condenser before vapours are formed. After few minutes vapours are formed which condense into oil. The batch process is continued for few hours to recover the total oil. Stop the heating when there is no increase in the volume of oil distilled. The oil floating on the water, in graduated glass column, forms an upper layer which is measured and collected in a separate container. The water droplets in the oil are dried by anhydrous sodium sulphate.

Salient features of the apparatus

An indigenously designed, portable, cost effective , ecofriendly, easy to handle, more stable & durable small house hold distillation apparatus which can distill lighter and heavier essential oils.

Construction material	:	SS-304 and Borosil glass.
Vessel volume	:	25 L and 50 L (approx.)
Batch capacity	:	4-5 kg and 8-10 kg of plant material
Type of distillation	:	Water distillation, Water & Steam distillation and Steam distillation.
Mode of heating	:	LPG burner, direct heating with agro-waste, Kerosene/diesel burner, electrically heating and by steam injection.
Cost of the apparatus	:	Rs. 17,500/- for 25 L Capacity (US\$ 600-00) Rs. 28,000/- for 50 L Capacity (US\$ 900-00)

Operational inputs per batch :

S.No.	Particulars	Batch Capacity	
		4-5 kg	8-10 kg
1.	Fuel wood*	15 kg	25 kg
2.	Manpower	4-5 hr	5 hr
3.	Water and utilities	extra	extra

(* For other types of heating modes see salient features)

The processing parameters for distillation of different kinds of aromatic plant materials by this apparatus are available with this Institute.

Other accessories / consumable :

The entrepreneur should have the following accessories/consumables as a minimum requirement:

Anhydrous sodium sulphate, separating funnel, measuring cylinder, beakers and conical flasks, glass bottles/vials for storage of the oils.

A distiller / producer of these oils is required to have linkages with essential oil traders who are marketing these products.

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Cover photograph : Mini Essential Oil Distillation Apparatus.

This folder is first printed in January 2001. Cost of the apparatus is subject to change from time to time without prior intimation

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