



# “STUDIES ON OIL YIELDING MEDICINAL PLANTS FROM UTKARSHA VANAUSHADHI UDYAN OF KHAPRI (PARSODI), DISTRICT NAGPUR.”

<sup>1</sup>Thawkar P. S., <sup>2</sup>Pohekar H.R

<sup>1</sup>PG Student, <sup>2</sup>Assistant Professor and Head  
Department of Botany,

Institute of Science, Nagpur, Maharashtra, India-440001

**Abstract:** Plants are used for a variety of purposes. The history of natural product is relatively old and dates back to the time when early man became conscious of his environment. Cultured and civilized man has been on earth for two or three million years. He has struggled for his life for the era. Medicinal oils are receiving increasing attention worldwide, as they are effective sources of several bioactive compounds.

Several studies highlight the beneficial effect of oils extracted from medicinal plants on curing human diseases such as hypertension, diabetes, diarrhea and obesity. Oils obtained are either used for edible purposes or medicinal uses and cooking purposes. Recently, oil-yielding plants have attracted more attention due to an increasing demand for their vegetable oils, livestock feed, pharmaceutical biofuels and other chemical industries.

The present study includes 22 different plants available from Utkarsha Vanaushadhi Udyan. Different plants parts of various species are used as medicinal oil for treating various diseases. For each species the following information is provided: Family, Common name, Medicinal uses along with photographs of plants and their oil products.

**Index Terms** - Medicinal uses, oil yielding species, oil products, oil extraction, Nagpur.

## I. INTRODUCTION

Plants have been used in medicine since Vedic times. Rigveda and Atharvaveda have detailed information about herbs (Griffith, R. 2010). Ayurveda is considered a Sub-Veda of Atharvaveda (Whitney, W. D. 1905, Whitney, W. 1853). Plants are precious gift of nature. There are many herbs around us which can save our health. But because we do not have knowledge of it, we cannot use it. Thousands of years' effort, by examination much has thought him to differentiate between useful and harmful plants. Since then, herbs have been used in all cultures as an important source of medicine.

There are various medical methods practiced all over the world. Various medicines are made from many ingredients. In today's fast paced era, we keep on taking modern medicine for minor ailments. You also get relief from that medicine. But those medicines have side effects on our body. They are not visible immediately but are felt over time. But herbs are our diet is a factor. Side effects are rare. Herbs are easily available many can be found in our kitchen. It is the need of the hour to utilize, preserve and pass on our ancient and effective medicines to our next generation.

The leaves can be used a fresh or dried for use as a spice. Essential oils extracted from fresh leaves and flowers can be used as aroma additives in food, pharmaceuticals and cosmetics (Simon *et.al.*, 1999; Senatore 1996). Essential oils are botanical products, typically derived from whole plants or certain parts of flowers, roots, bark, leaves, seeds, peels, fruits or wood. They come from different plant origins such as Lamiaceae, Asteraceae, Malvaceae, Solanaceae, Fabaceae etc. Different methods can be applied for oil extraction, such as hydro-distillation, steam distillation, and solvent extraction. For example, hydro-distillation or steam distillation is typically used for Citrus and Lamiaceae family members. Various factors, such as the extraction method, geographical conditions, type of soil, plant material, and harvesting stage, are being reported to influence on the occurrence of number of chemical constituents in Oils and variations in Oils quality and yield (Masotti *et.al.* 2003; Angioni *et.al.* 2006; Swamy and Sinniah 2015; Swamy *et.al.* 2016).

Oil extracted from plants is of high commercial value in medicine. Enhancing yield and maintaining the quality of oil is of significant commercial importance. The present study was aimed to document the availability of oil yield plants and their uses by the medicines of Khapri area district Nagpur.

## II. METHODOLOGY

The present study was carried out in Utkarsha Vanaushadhi Udyan, Khapri (Parsodi) Nagpur, to study the oil yielding medicinal plants. The data was collected by field visit during the month of Jan-March 2023.

The study was conducted with the help of the local knowledgeable people and women who making medicinal oils, so the medicinal species yielding the oil should be properly identified. The method of study was adopted according to the study proposed by earlier workers. The plant specimens collected during the survey were identified with the help of Utkarsha Vanaushadhi Udyan Book, this book has been compiled by Shri Pradip Kate. During the survey work some oil yielding plants were noticed which are mostly used for medicinal purposes by the local inhabitants in their day-to-day life. Material and method were obtained through questionnaires with workers. Local names of plants, specific plants for oil preparation and their parts used were asked to show plants or plant parts if available. Some medicinal oil properties are extracted from the plants of this Udyan. Those oils are called by specific names like Amritdhara oil, Nirgundi oil, Nimbu ghas oil, Medohar oil, Tikhadi oil, peppermint oil, Vacha oil, Khandu-Chakka oil, etc. (Plate-2).

Mainly *Sesame* oil is used to make different types of oil in this Udyan and Steam distillation process is commonly used to extract oil.

### **About steam distillation: -**

Steam distillation is the most popular method used to extract and isolate essential oils from plants for use in natural products. This happens when the steam vaporizes the plant material's volatile compounds which eventually go through a condensation and collection. In this case it is useful to have hot water vapor to remove and transport, in particular, very essential oils. Water vapors penetrate into the vegetative mass, subjected to distillation, destroy the coating of the olefins, volatilize the oil and then mix with it.

### **Steam Distillation Process: -**

A large container which is usually made of stainless steel, containing the plant material has steam added to it (Plate-2).

1. Through an inlet, steam is injected through the plant material containing the desired oils, releasing the plant's aromatic molecules and turning them into vapor.
2. The vaporized plant compounds travel to the condensation flask or the Condenser. Here, two separate pipes make it possible for hot water to exit and for cold water to enter the Condenser. This makes the vapor cool back into liquid form.
3. The aromatic liquid by-product drops from the Condenser and collects inside a receptacle underneath it, which is called a Separator. Because water and oil do not mix, the essential oil floats on top of the water. From here, it is siphoned off. (Some essential oils are heavier than water, such as clove essential oil, so they are found at the bottom of the Separator.)

During field visit to the study area information regarding plants was collected and photographs of different oil producing plants taken by using GPS Map camera. Photographs of these oil-yielding plants and their parts are shown on plates (Plate- 1).

### III. OBSERVATIONS

In present study 22 different plant species belong to 13 families. These 22 plant species are used for purpose of extraction or preparation as an oil. All collected information is tubulated in the form of a table (Table-1). Oil bottles name and their uses are shown in (Table-2).

**Table-1** Information regarding medicinal oil yielding plants, from Khapri area.

Sr. No.	Botanical Name	Family	Local Name in Marathi	Habit	Wild / Cultivated	Plant part use
1.	<i>Acacia nilotica</i> (L.)P.J.H.Hurter & Mabb.	Fabaceae	Babhul बाभूळ	Tree	W	Seeds, Leaves, stem.
2.	<i>Acorus calamus</i> L.,1753	Acoraceae	Wekhand/Wacha वेखंड/वचा	Herb	C	Root.
3.	<i>Abutilon indicum</i> (L.)	Malvaceae	Atibala/ Petari अतिबला/पेटारी	Shrub	W	Root, bark, leaves, seeds.
4.	<i>Aloe-vera</i> (L.) Burm.f.	Asphodelaceae	Korfad कोरफड	Herb	C	Leaves.
5.	<i>Carum copticum</i> ( <i>Trachyspermum ammi</i> (L.) Sprague ex Turrill	Apiaceae	Ajwain / Ova ओवा	Herb	C	Seeds.
6.	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Bramhi/ mandukparni ब्राम्ही/मंडुकपर्णी	Herb	W	Leaves
7.	<i>Cinnamomum camphora</i> . Nees	Lauraceae	Kapoor कापूर	Tree	C	Wood
8.	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) W. Watson	Poaceae	Nimbu-ghas निंबूघास	Herb	W	Leaves.
9.	<i>Cymbopogon martinni</i> (Roxb.) Wats.	Poaceae	Tikhadi तिखाडी	Herb	W	Leaves.
10.	<i>Ehertia laevis</i> Roxb.	Boraginaceae	Khandu- chakka खंडूचक्का	Herb	W	Leaves, bark, stem, seeds, & fruits.
11.	<i>Mimosa pudica</i> L.	Fabaceae	Chuimui लाजवंती	Herb	W	Roots, leaves & seeds.
12.	<i>Mentha piperita</i> L.	Lamiaceae	Thandai/ peppermint थंडाई/पेपरमीट	Herb	W	Flower, leaves

13.	<i>Mentha spicata</i> L.	Lamiaceae	Pudina पुदिना	Herb	W	Leaves.
14.	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Parijat/prajakta पारिजात/प्राजक्ता	Shrub	W	Seeds, leaves, bark.
15.	<i>Ocimum gratissimum</i> L.	Lamiaceae	Tulas (Hiravi) तुळस (हिरवी)	Herb	W	Whole plant.
16.	<i>Ocimum kilimandscharium</i> Gurke.	Lamiaceae	Tulas (Kapoor) तुळस (कपूर)	Shrub	C	Whole plant.
17.	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulas (Kali) तुळस (काळी)	Herb	W	Whole plant.
18.	<i>Sida cordifolia</i> L.	Malvaceae	Bala बला	Shrub	W	Leaves, root.
19.	<i>Spilanthes acmella</i> (L.) R.K.Jansen	Asteraceae	Akkalkadha अक्कलकाढा	Herb	C	Flower, root, leaves.
20.	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun अर्जुन	Tree	W	Bark, leaves.
21.	<i>Vitex negundo</i> L.	Lamiaceae	Nir-gundi निरगुंडी	Shrub	C	Leaves, root.
22.	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Ashwagandha अश्वगंधा	Shrub	C	Root.

**3.2 Table-2:** - The table includes information on oil products extracted from various plant material and their uses:

Sr. No.	Oil bottles name in Marathi	Plants use to extract oil	Oil uses
1.	Amrutdhara oil अमृतधारा तेल	<i>Carum copticum</i> , <i>Mentha piperita</i> , <i>Ocimum kilimandscharicum</i>	Relieves muscle pain, Useful on coughs.
2.	Khandu chakka oil खंडु चक्का तेल	<i>Ehretia laevis</i>	This plant is used for wounds of arms, bone pain, its extract in oil is a pain reliever in place of pain.
3.	Medohar oil मेदोहर तेल	<i>Mimosa pudica</i> , <i>Withania somnifera</i>	To destroy excess body fat.
4.	Nimbu ghas oil निंबु घास तेल	<i>Cymbopogon flexuosus</i>	Reduces muscle pain, Brightens the skin, Mosquitoes are reduced.
5.	Nirgundi oil निरगुंडी तेल	<i>Vitex negundo</i> , <i>Acacia nilotica</i> , <i>Nyctanthes arbor-tristis</i>	To relieve muscle pain due to the effects of vat disorders.
6.	Peppermint mentha oil पेपरमींट तेल	<i>Mentha spicata</i>	Swelling, Joint pain, Back pain, Toothache and Beneficial in fever.

7.	Tikhadi oil तिखाडी तेल	<i>Cymbopogon martinii</i>	Useful in muscle pain, Oil for muscle pain relief.
8.	Vacha oil वचा तेल	<i>Acorus calamus,</i> <i>Abutilon indicum,</i> <i>Centella asiatica,</i> <i>Aloe vera,</i> <i>Cymbopogon flexuosus,</i> <i>Ocimum sanctum,</i> <i>Spilanthes acemella</i>	Massage oil for relief of blue and knotted veins and those painful veins

3.3 Plates

PLATE: I



			
<p><i>Cymbopogon martinni</i> (Roxb.) Wats.</p>	<p><i>Ehertia laevis</i> Roxb.</p>	<p><i>Mimosa pudica</i> L.</p>	<p><i>Mentha piperita</i> L.</p>
			
<p><i>Mentha spicata</i> L.</p>	<p><i>Nyctanthes arbor-tristis</i> L.</p>	<p><i>Ocimum gratissimum</i> L.</p>	<p><i>Ocimum kilimandscharium</i> Gurke.</p>
			
<p><i>Ocimum sanctum</i> L.</p>	<p><i>Sida cordifolia</i> L.</p>	<p><i>Spilanthes acmella</i> (L.) <u>R.K.Jansen</u></p>	<p><i>Terminalia arjuna</i> (Roxb.) Wight &amp; Arn.</p>
			
<p><i>Vitex negundo</i> L.</p>	<p><i>Withania somnifera</i> (L.) <u>Dunal</u></p>		

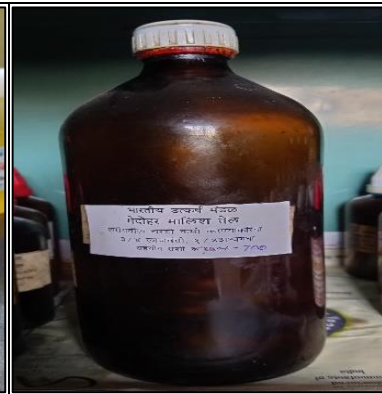
PLATE: II



Amrut dhara oil



Kandu chakka oil



Medohar oil



Nimbu ghas oil



Nirgundi oil



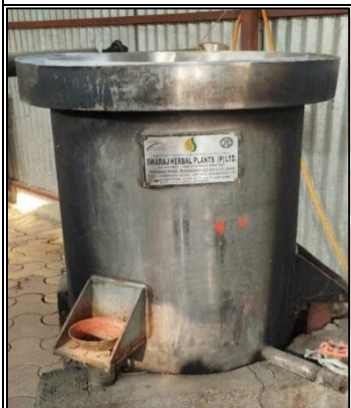
Peppermint oil



Tikhadi oil



Vacha oil



Steam distillation machine and Photographs of worker during oil extraction

### 3.3 Figures

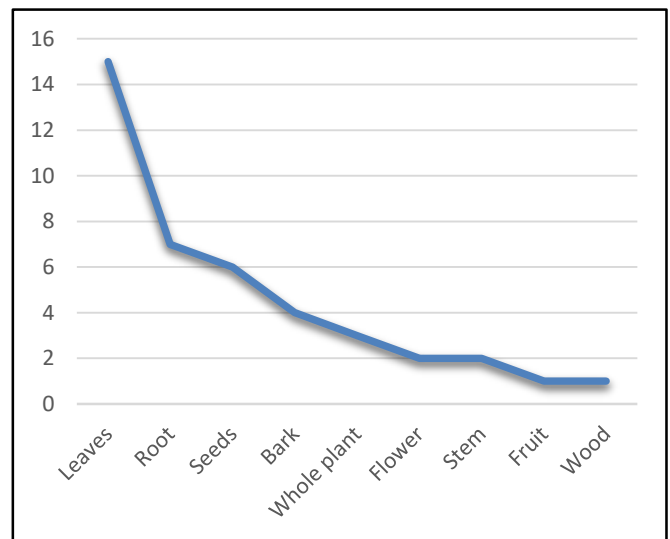


Fig: 1. Location Map of study area

Fig:2. Different plant parts used for oil extraction

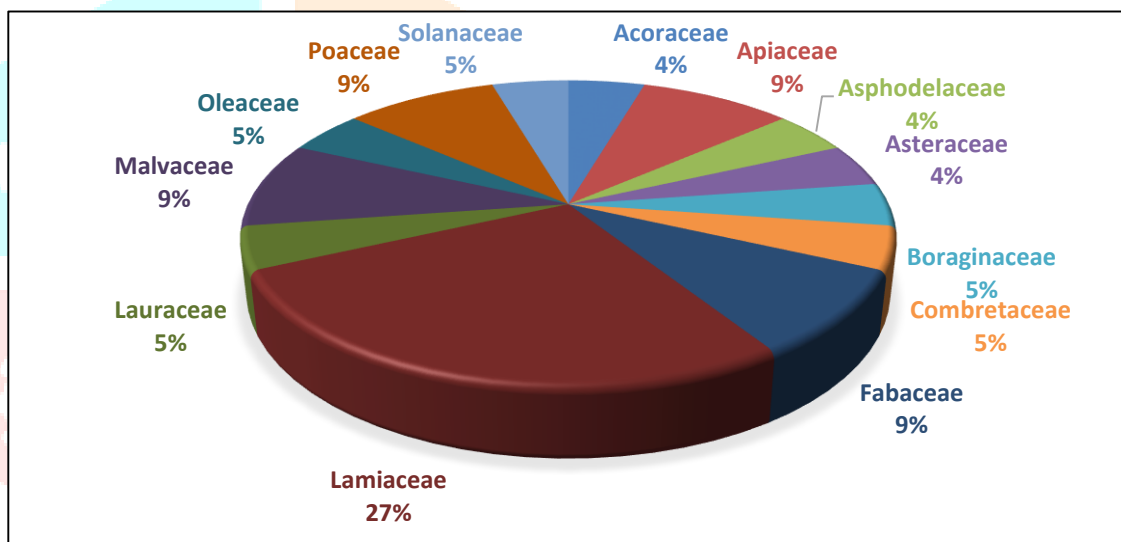


Fig: 3. Family wise distribution of plant species (%)

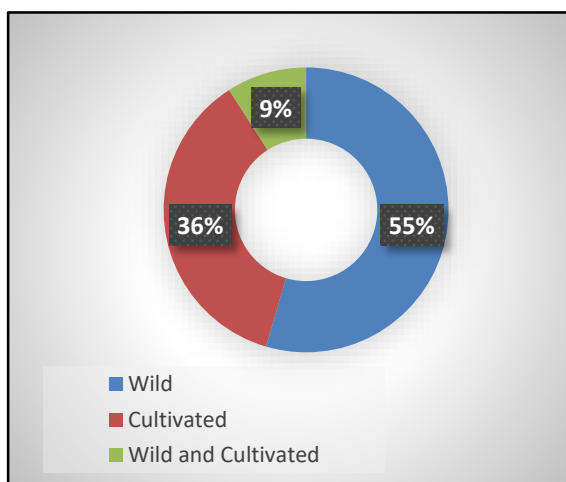


Fig: 4. Proportion of wild and cultivated plants

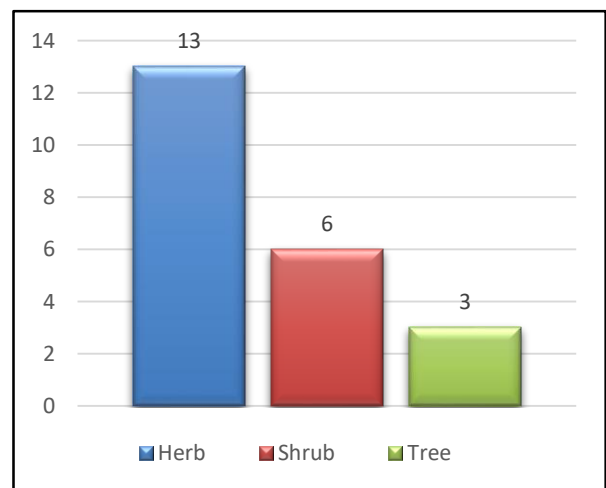


Fig: 5. Habit-wise distribution of plant species



#### IV. RESULTS AND DISCUSSION

The results of the medicinal oil yielding plants study are presented in (Table-1). A total of 22 plants species belonging to 13 families were documented. Among the 13 families, the Lamiaceae family is the most abundant, with 6 species. Acoraceae, Asphodelaceae, Apiaceae, Lauraceae, Boraginaceae, Oleaceae, Asteraceae, Combretaceae, Solanaceae families with single species each and Fabaceae, Malvaceae, Poaceae with 2 species each (Figure- 3). For each species the following information was provided: The plant species with scientific names are arranged alphabetically followed by family name, brief description of the plant, habit, wild or cultivated, local name, medicinal uses, parts used (Table-1). Habit wise analysis of available species indicated that 3 were trees, 13 herbs, 6 shrubs (Figure-5). Most of this plant species are growing wild. These 22 plants are used for the treatment of relieve muscle pain, useful on cough, to destroy excess body fat, brightens the skin, swelling, joint pain, back pain, beneficial in fever, relief of blue and knotted veins and those painful veins.

Different parts of the plant such as roots, flowers, leaves, barks, seeds, fruits, stems etc. are used to prepare of medicinal oil. Steam distillation process is commonly used to extract oil. Leaves are the main part of plants for oil extraction. steam is injected through the plant material containing the desired oils, releasing the plant's aromatic molecules and turning them into vapor. In most of the studies published so far, the duration of the distillation has been optimized. As an example, Puri & Jain (1960) described the distribution of 19 oil yielding plants. Samant & Palni, (2000) from Indian Himalayan region carried out "Diversity, distribution and indigenous uses of essential oil-yielding medicinal plants. Cannon *et al.*, (2013) identified 20 min as the optimum processing time to achieve the highest yield of essential oils from peppermint (1.89%), lemongrass (0.16%) and palmarosa (0.18%). They also observed that increasing the time up to 160 & 240 min did not induce any further increase of essential oils yield. Similar finding has been also reported in other studied Zheljzakov VD, Astatkie T, O'Brocki B, Jeliaskova E (2013). Gawde A, Cantrell CL, Schlegel V (2014). Monica Butnariu, Ioan Sarac (2018) has discussed the "Essential oils from plants" they concluded that the Essential oils are a rich source of biologically active compounds. Harekrishna Nial & Gyanranjan Mahalik (2020) has studied the Wild native oil yielding plants and their utilization by the tribals from Nabarangpur District of Odisha.

#### V. CONCLUSION

The present study was carried out in Utkarsha Vanaushadhi Udyan, Khapri (Parsodi) village of Nagpur District to get the information about medicinal oil yielding plants which are used in various ailments.

- During the survey I was found that the workers of this Udyan have great knowledge about medicinal plants and their uses in oil.
- Various types of oils have been prepared by the workers and they are cheap, those oils have no side effects. Medicinal oils treatment is prescribed to all age group from infants to older people and used in daily life such as for headache, fever, cold, cough, relieves muscle pain, swellings etc.
- It was also noted that treatment of some plants is restricted to particular age group and doses of drugs are different for different age groups.

The finding of this study provided that, most of the plants used by the community of study area oil yield substances in seed, stem, flower and leaf parts of surveyed plants. Studies have also shown that oils from unconventional native sources will not only fill the gap between demand and supply, it could be a source of earning of the foreign exchange. It is believed that Utkarsha Vanaushadhi Udyan, Khapri area oil bearing plant resource provides people with a checklist for better treatment and has prepared a book for information on oil and medicinal plants. It is important to collect the information and database of oil yielding medicinal plants for future research and development of new drugs.

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