



## Extraction of Volatile oil component form wild peppermint (*Mentha Pulegium*) by Clevanger Method and it's use as Natural Food Flavouring Agent.

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### ABSTRACT -

This introduces the function of wild peppermint. (a natural food flavoring agent). The main purpose of wild peppermint is to use peppermint oil topically (applied to the skin) for problems such as headaches, muscle aches, joint pain, and itching. Peppermint oil is used in aromatherapy to treat coughs, colds, pain, improve mental function and reduce stress. Main difference between mint and peppermint is that peppermint has the strongest flavor compared to other members of the mint family. Mint is a herbaceous plant belonging to the genus *Mentha Pulegium*. Peppermint is one such species that has a very dark aroma. Many Volatile components are present in it. So we chose this species (*Mentha Pulegium*). The easiest way to distinguish wild mint from other plants in its family is that wild mint has a strong odor when the leaves or stems are crushed by hand. And its smell lasts for a long time too. In the wild peppermint in presence study we extracted the volatile oil constituents of peppermint oil by the Clevanger method. Main ingredients of wild peppermint leaves. Wild peppermint is rich in the volatile compound's alpha-pinene, 1-8 cineole, camphor, menthone, and pulegone. I use the wild peppermint (*Mentha pulegium*) plant near my house to extract the oil. Wild peppermint acts as a natural flavoring agent during the oil extraction process. The health benefits of wild peppermint are anti-inflammatory, antioxidant, anticancer, antiseptic, anti-inflammatory, anti-plasmodial. Like common mint, wild peppermint differs in taste, smell and many volatile components. Just like we use peppermint in our daily life, we can also use wild peppermint in our daily life. Peppermint contains 0.05-1% menthol. It has a delicate smell. And wild (peppermint) contains up to 40% menthol. A very strong smell. We extracted the oil and used it as a natural food flavoring agent. He's got good points. Everyone liked it. accepted by sensory panelist members. Thus, sensory evaluation was done. Wild peppermint oil extract which is 0.4 ml/8g.

**Key words:** Wild peppermint leaves, difference between Mint ( spearmint) and Wild (peppermint)

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### INTRODUCTION

Hydrodistillation of parts of *Mentha pulegium* L., collected from the wild and recorded for the first time from different locations in the High Himalayas, Jammu and Kashmir, India, yielded a refreshing light colored essential oil with characteristic wild peppermint flavor. Wild *peppermint* also known as mint. Essential oils from different locations were qualitatively similar. and was found to be a complex mixture of at least 45 compounds, of which 24 were identified. Eight compounds make up about 87-98% of the oil. And they were identified as Pulegone (65.9-83.1%)[1].

The essential oil constituents of *Mentha pulegium* were isolated by hydrodistillation. and analyzed them using GC-MS. The oil was found to contain 53 elements. The major compounds were pulegone (43.5 %), piperitone (12.2 %), p-menthen-1,2,3-triol (6.5 %),  $\gamma$ -elemenene (3.6 %), guaiane (cis- $\beta$ ) (3.0 %) are. Carvacrol Acetate (2.6%) and Phenyl Ethyl Alcohol (2.4%). *Mentha pulegium* L. Its essential oil belongs to the pulegone chemotype, as the oil is rich in pulegone (43.5%)[2]. Extracted composition of volatile oil (*Mentha pulegium* L.) plants was investigated by gas chromatography-mass spectrometry. The volatile gases responsible for the characteristic minty and pungent aroma of this plant were determined by chromatography-olfactometry. The volatile oil extract was found to be rich in oxygenated monoterpenes, mainly pulegone and piperitone oxide, followed by isopulegol, piperitone and piperitanone [3]. There is a growing interest in the industry to replace synthetic chemicals with natural products with bioactive properties of plant origin. The aim of this study was to determine the chemical composition of European pennyroyal (*Mentha pulegium*) essential oil and to characterize the in vitro antioxidant and antimicrobial activities of its water (hot and cold), ethanolic extract and essential oil. The essential oil revealed menthone, pulegone and neo-menthol as major components, comprising 35.9, 23.2

and 9.2% of the essential oil, respectively. The hot water extract showed the highest antioxidant activity and phenol content[4].

The genus *Mentha pulegium* (Lamiaceae) is distributed worldwide. and found in many environments. *Mentha* species, one of the oldest and most popular medicinal plants in the world, is widely used in cooking, cosmetics and as alternative or complementary therapy, mainly to treat gastrointestinal disorders such as flatulence, indigestion, nausea, vomiting, anorexia and ulcerative colitis. Furthermore, essential oils and extracts of *Mentha* species have antimicrobial, antifungal, antiviral, insecticidal and antioxidant properties. This is well documented. The economic importance of mints is also evident; Peppermint oil and its constituents and derivatives are used worldwide as flavoring agents in the food, pharmaceutical, herbal, perfumery and flavoring industries[5]. Plants are rich in phytochemical compounds. which are the source of dietary ingredients used to treat various diseases and problems. Among medicinal plants, mint (*Mentha* species) exhibits many health beneficial properties such as anti-cancer and anti-obesity, antimicrobial, anti-inflammatory, anti-diabetic, and cardioprotective effects, as a result of its antioxidant capacity, combined. Low toxicity and high efficiency.[6]The wild *peppermint* extract with water by using Clevenger apparatus also we can used steam distillation extracted the volatile material. Extracted flavour is used for *peppermint* candy and beverage product as Natural Flavouring Agent.[7].

## MATERIALS AND METHODS

The present project work entitled 'Extraction of Volatile oil compoent form wild *peppermint* (*Mentha Pulegium*) by Clevanger Method and it's use as Natural Food Flavouring Agent.' 'was carried out in laboratory of department of food proessing and packaging, yashwantrao chavan institute of sciences, Satara ;during the academic year of 2022-2023.Product was prepared and analyzed for different Physical and sensory attributes.

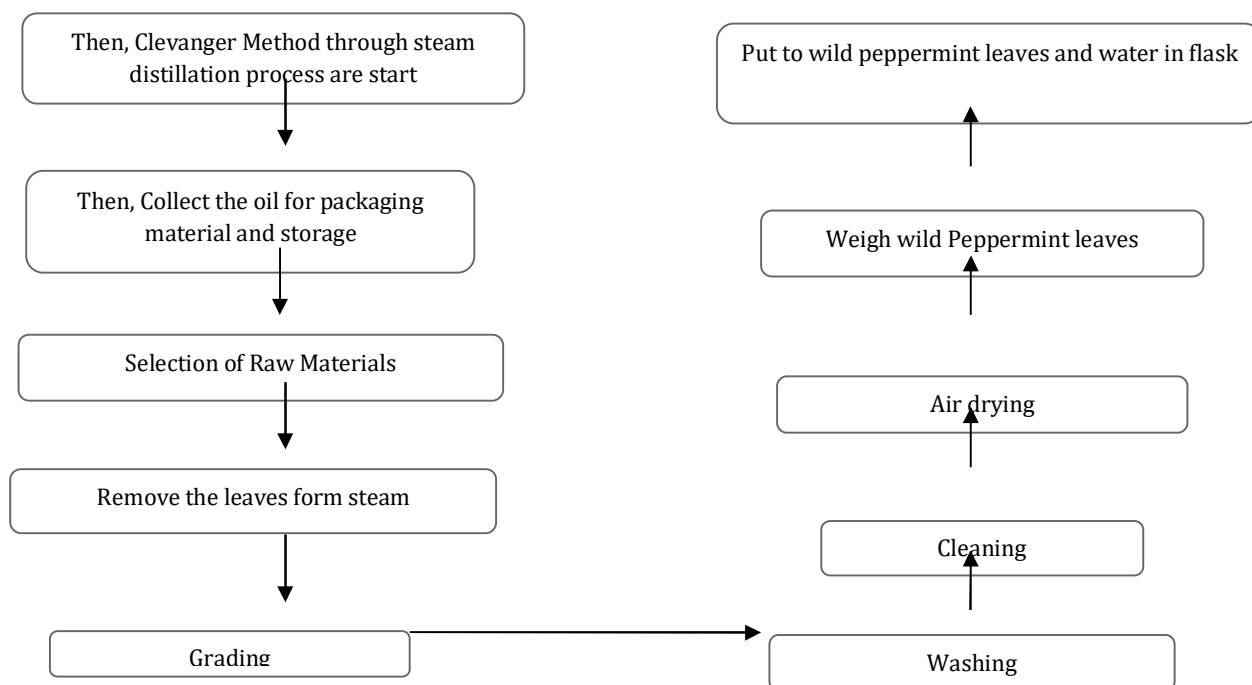
### 2.1 Collection of raw materials and equipment's -

The material required for the experiment were give from the near to house of Satara.The Clevanger Apparatus available in Department of Food Processing and Packaging Yashwantrao Chavan Institute of Science Satara, were used for extraction of volatile oil wild *peppermint* by Natural Food Flavouring agent.Approximate analysis is left as the machine is not available.

#### Materials -

Wild *peppermint* leaves Genus (*Mentha Pulegium*), Family Lamiaceae

#### Standard Methods -



#### Collection of Wild *peppermint* leaves materials -

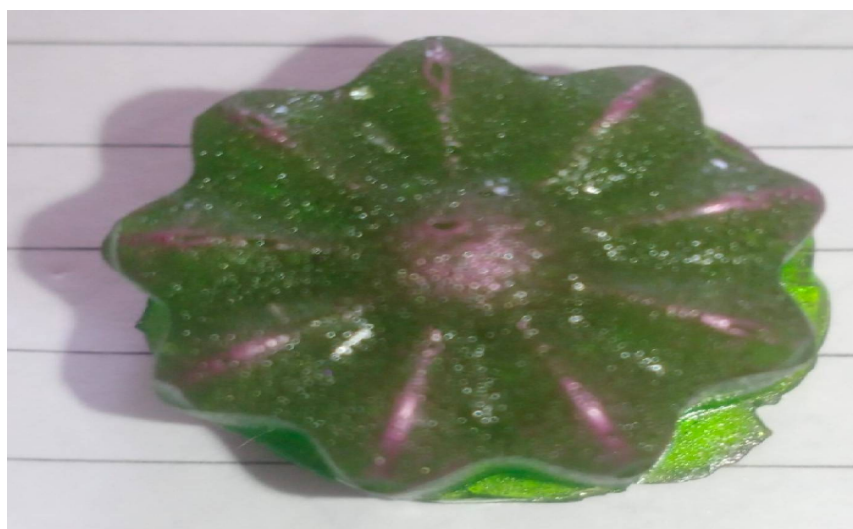
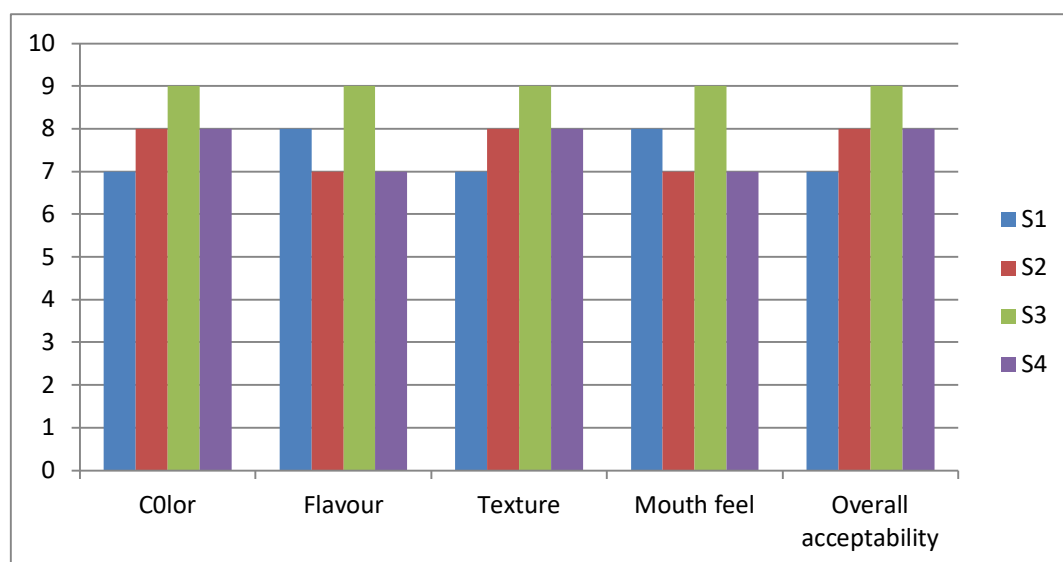
This study was carried out in the Department of Food processing and Packaging, Yashavantrao Chavan Institute of Science, Satara.( Shivaji University) The Wild *peppermint* leaves (*Mentha Pulegium*)were taken as samples. samples were obtained from near to home.

**Extraction of Volatile oil component form wild *peppermint* (*Mentha Pulegium*)** - The leaves samples were Remove the leaves form steam, Grading, washed and clean properly. The obtained leaves materials

were dried at room temperature in a sun drying region for 10-20 min. The sterile distilled water the extraction of collected leaves materials. The 8 g of each powdered sample was extracted with 200 ml of water. The process temperature for oil extraction is 80°C. After some time the layer of water and oil separates. The mixture was the collected stored at room temperature for further use.

## RESULT AND DISCUSSION -

The present study was done to evaluate the Natural Food Flavouring Agent. Wild *Peppermint* oil extraction prepared with different point variation of oil extraction in food. They are analyzed for sensory Analysis. The Hedonic rating is used to measure the acceptability of the 9 point hedonic rating to scale food products. with respect to colour, flavour, texture, aroma, and overall acceptability sensory score. The particular faculty members and students are asked to rate Natural Flavouring Agent. Results checked and explained.



**Fig. 1 Point variation of oil extraction in food Natural Food Flavouring Agent.**

## CONCLUSION

Acceptable sensory characteristics prepare the natural flavoring agent. It Smells like a minty flavor. Oil extraction is a deficient-cost process. We have extracted volatile oil from wild *peppermint*, which is available at no cost. This extract can be used as a natural food flavoring agent. For example, it can be used in candy and beverages. Along with flavor, wild *peppermint* consumption reduces cough, cold, and cough; wild *peppermint* also cools your body. We have extracted 0.4 ml/8g of wild *peppermint* extract in the present study.

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## REFERENCES

1. VK Agnihotri, SG Agarwal, PL Dhar, RK Thappa, BK Kapahi, RK Saxena, GN Qazi, (2005), Essential oil composition of *Mentha pulegium* L. growing wild in the north-western Himalayas India.
2. Ahmed H El-Ghorab (2006),The chemical composition of the *Mentha pulegium* L. essential oil from Egypt and its antioxidant activity. Journal of Essential Oil Bearing Plants 9 (2), 183-195,
3. M Consuelo Díaz-Maroto, Noelia Castillo, Lucía Castro-Vázquez, Miguel Ángel González-Viñas, M Soledad Pérez-Coello,(2007), Volatile composition and olfactory profile of pennyroyal (*Mentha pulegium* L.) plants.
4. Bárbara Teixeira, António Marques, Cristina Ramos, Irineu Batista, Carmo Serrano, Olívia Matos, Nuno R Neng, José MF Nogueira, Jorge Alexandre Saraiva, Maria Leonor Nunes, (2012). 2012,European pennyroyal (*Mentha pulegium*) from Portugal: Chemical composition of essential oil and antioxidant and antimicrobial properties of extracts and essential oil. Industrial Crops and Products 36 (1), 81-87,
5. Fatiha Brahmi, Madani Khodir, Chibane Mohamed and Duez Pierre, March 15th, 2017, Chemical Composition and Biological Activities of *Mentha* Species.
6. Irum Naureen, Aisha Saleem, Fabiha Sagheer, Sadia Liaqat, Sabiha Gull, Muqadas Fatima, Zainab Arshad, (2022), Chemical Composition and Therapeutic Effect of *Mentha* Species on Human Physiology. Sch Bull 8 (1), 25-32,
7. Leandra Rodrigues, Orlanda Póvoa, Generosa Teixeira, Ana Cristina Figueiredo, Margarida Moldão, Ana Monteiro, (2013). Trichomes micromorphology and essential oil variation at different developmental stages of cultivated and wild growing *Mentha pulegium* L. populations from Portugal. <https://doi.org/10.1016/j.indcrop.2012.07.061>
8. Suzara s costa, Yvan Garipey, Sandra C. S. Rocha, Vijaya Raghavan, (2013), Microwave extraction of mint essential oil- Temperature Calibration for the oven. <https://doi.org/10.1016/j.jfoodeng.2013.10.033>
9. H Ouakouak, M Chohra, M Denane (2015), Chemical composition, antioxidant activities of the essential oil of *Mentha pulegium* L, South East of Algeria. International Letters of Natural Sciences 39,
10. Amina Benabdallah, Chaabane Rahmoune, Mahieddine Boumendjel, Oumayma Aissi, Chokri Messaoud, (2016), Total phenolic content and antioxidant activity of six wild *Mentha* species (Lamiaceae) from northeast of Algeria. Asian Pacific journal of tropical biomedicine 6 (9), 760-766,
11. Babak Babakhani, Parvaneh Rahdari, Boldaji Seyed Afshin Hosseini, Atefeh Koochi, (2016), The effects of solvent type and extraction method on phenolics content and antibacterial and antioxidant properties of Pennyroyal (*Mentha pulegium* L.) extract. International Journal Of Molecular And Clinical Microbiology 6 (2), 725-733,
12. Mohammed Yahya Hadi (Al-Qasim Green University), Imad Hadi Hameed (Al-Qasim Green University), Israa Adnan (University of Babylon), (2017), *Mentha pulegium*: Medicinal uses, Anti-Hepatic, Antibacterial, Antioxidant effect and Analysis of Bioactive Natural Compounds: A Review.
13. Annarita Stringaro, Marisa Colone, Letizia Angiolella, (2018), Antioxidant, Antifungal, Antibiofilm, and Cytotoxic Activities of *Mentha* spp. Essential Oils. Medicines 5 (4), 112,
14. A Benabdallah, M Boumendjel, O Aissi, C Rahmoune, M Boussaid, C Messaoud, (2018), Chemical composition, antioxidant activity and acetylcholinesterase inhibitory of wild *Mentha* species from northeastern Algeria. South African Journal of Botany 116, 131-139,
15. Messaoudi M, Rebiai A, Sawicka B, Atanassova M, Ouakouak H, Larkem I, Egbuna C, Awuchi CG, Boubekeur S, Ferhat MA, Begaa S, Benchikha N. (2021). Effect of Extraction Methods on Polyphenols, Flavonoids, Mineral Elements, and Biological Activities of Essential Oil and Extracts of *Mentha pulegium* L. Molecules. 21;27(1):11. doi: 10.3390/molecules27010011. PMID: 35011242; PMCID: PMC8746320.
16. Jed Jebali, Hanene Ghazghazi, Chedia Aouadhi, Ines ELBini-Dhouib, Ridha Ben Salem, Najet Srairi-Abid, Naziha Marrakchi, Ghayth Rigane, (2022), Tunisian Native *Mentha pulegium* L. Extracts: Phytochemical Composition and Biological Activities. Molecules 27 (1), 314,
17. Irum Naureen, Aisha Saleem, Fabiha Sagheer, Sadia Liaqat, Sabiha Gull, Muqadas Fatima, Zainab Arshad, (2022), Chemical Composition and Therapeutic Effect of *Mentha* Species on Human Physiology. Sch Bull 8 (1), 25-32,

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