INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

Review Article

An Overview of the Pudina, Tulsi, Cinnamon, and Honey used in the Treatment of Cough

Kunal Badole*, Pravinkumar Shahare

Chhatrapati Shivaji College of Pharmacy, Deori, Gondia, Maharashtra, India.

ARTICLE INFO

Published: 29 May 2026
Keywords:
Herbal cough syrup, Pudina, Tulsi, Cinnamon, Honey, Antitussive, Antimicrobial, Anti-inflammatory.
DOI:
10.5281/zenodo.20447297

ABSTRACT

Herbal medicines are widely employed in the treatment of cough because of their therapeutic efficacy and comparatively fewer side effects than synthetic drugs. This review emphasizes the medicinal significance of Pudina (Mentha arvensis), Tulsi (Ocimum sanctum), Cinnamon (Cinnamomum verum), and Honey (Apis mellifera) in herbal cough formulations. These natural ingredients exhibit antimicrobial, antioxidant, anti-inflammatory, and soothing properties, which contribute to the alleviation of cough and respiratory discomfort. Their active constituents, including menthol, eugenol, cinnamaldehyde, and phenolic compounds, are responsible for their therapeutic effects. Herbal cough syrups formulated from these ingredients may therefore serve as safe, effective, and patient-friendly alternatives for cough management.

INTRODUCTION

Herbal Treatment for Cough

Now a days, herbal remedies are commonly used for the treatment of cough. also the herbal drugs as well as herbal formulations are playing important role in various types of cough. In present days, therapies like cough suppressants are used for cough. The antitussive agent gives only symptomatic relief. There agents are contraindicated in asthma. They also cause different serious adverse effect which includes respiratory depression, vomiting, nausea, sedation and also patients with diminished respiratory reserve. There is recent years, researchers are focusing on the herbal medicine which are having less side effect.

Herbal plant and formulation are used for many types of disease like cough syrup and other disease. The cough syrup many types of herbal plant are used for Pudina, Tulsi, Cinnamon, honey in that whole plant are used for making herbal medicine the many years. Herbal formulation a most commonly used a development as well as developing countries as health care.

***Corresponding Author:** Kunal Badole
Address: *Chhatrapati Shivaji College of Pharmacy, Deori, Gondia, Maharashtra, India*
Email : kunalbadole96@gmail.com
Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Herbal syrup it is a defined as a prepared and combination and concentration decoction with Honey sugar or either some time use alcohol. The base of such syrup is a strong herbal decoction and mixing a decoction with sugar honey help to thicken preserves the decoction.[1]

The cough syrup medication is a liquid dosage form use of oral liquid pharmaceutical has been confirm on basic ease of administration to those people who have the problem in the swallowing of solid dosage from medication. Syrup is a concentrated solution contains sugar and purified water. In syrup from the other type of syrup solutions. The syrup may be or may not be containing medication or mixed flavouring agent. When the syrup without a medication but the flavouring agent present are known as flavoured or non-medicated syrup.[2]

Flavoured syrup are frequently used as vehicle for the unpleasant test of medications results (found as) is medicated syrups.

As stated to an estimate of the World Health Organization (WHO), there are 80% of the people populations although uses herbs and traditional medicines for needs of their primary health care. On the basis of WHO they define as there are three kinds of herbal medicines;

1. Raw plant material,
2. Processed plant material, and
3. Medicinal herbal products.[3]

The products of Herbal medicines that they contain active substance for instance other plant material or combination corresponding to as plant preparations. The solutions are a homogenous mixture of the dissolved drug in a liquid mixture. The molecules (particles) of solid, liquid or gaseous medications are equally allocating among the particles of liquid mixtures. Because medication is mixed already in solution, it absorbed from skin, stomach or other site of administration is faster than dosage form of medication.

Sugar are present in syrups in high amount to predisposes them to the bacterial infections, so they often use as a preservative.[4]

Syrup are very prominent delivery vehicle use for the anti tissue medication because they give a more soothing to swallow the tablet and capsule. This medication is quickly observed. There are same available synthetic cough preparations they cause several adverse effect. So the present study was show to enlarge and in violet herbal cough syrup carry natural element having no any side effect.[5]

In general health professionals having difficulties of accessing effectiveness and safety natural treatment (therapy). Number of instance allopathic medication product has not been studied in large scale and generally they solid without in knowledge of there mechanism of action or side effect. Even so the use of complementary medication is sometime helpful and the confirmation is same time helpful and the confirmation the effectiveness of some this all medication literature is limited, they frequently sold with the drug store.[6]

A successful formulation of liquid , as well as other dosage forms , requires a blend of scientific acuity and pharmaceutical “art”.[7] Oral liquid medicines are being superseded gradually by tablets and capsule because of deleterious changes take place more readily in solution.[8]

Nevertheless there are still a large number of liquid oral preparations are available in the official books. The fact is that the absorption of medicaments in solution from the GI tract into the

systemic circulation may be expected to occur more rapidly than other oral dosage forms of the same medicinal agent.[9] Ayurvedic formulations are preferentially administered by oral route[10] and most of the orally administered Ayurvedic formulations belong to liquid form of drug or drug combination.[11]

Type of Herbal Syrup

1. Flavoured syrup
2. Medicated syrup
3. Artificial syrup

Advantages of Herbal Syrup[12]

1. No side effects
2. No Harmless
3. Easily available
4. Easy to adjust the dose for child's weight
5. No nursing is required, which main and the patient can take it with no help.
6. The liquid dosage form is executed for products like cough medicines.
7. Herbs Grow in common place.
8. Antioxidant by retarding the oxidation as sugar is Hydrolysed in to cellulose and dextrose.
9. Good patient compliance especially paediatric patients as syrup are sweet in test.
10. It is a preservative by retarding the growth of bacteria, fungi and mould as osmotic

Disadvantages of Herbal Syrup[13,14]

1. Sedimentation of solid occasionally gives foot from of product.
2. Dose precision cannot be achieved unless suspension are packed in unit dosage forms.
3. Same microbial contamination take place it preservation not added in accurate proportion.
4. Also herbal medicine having another disadvantage is the risk of self dosing of herbs which is very rare.
5. Fluctuation in storage temperature may cause crystallization of sucrose from saturated syrup.
6. Herbal medicine are the natural product. The effectiveness of herbal medicines is not optimized in laboratory so it taken time to produce effect.

PLANT PROFILE:

PUDINA (MINT):

Figure 1: Plant of Pudina

Synonyms : Peppermint, fragrant, Mentha leaves.[15]

Biological source : Pudina consists of dried leaves and obtained from flowering tops of menthe spicatalinn.[15]

Family : Lamiaceae[16]

Scientific classification[17]

Taxonomical Rank	Taxon
Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lamiales
Family	Lamiaceae
Genus	*Mentha*
Species	*Mentha arvensis*

Vernacular classification[17]

English	Field mint, Japanese mint, Pennyroyal, Spearmint, Garden mint
Hindi	Ban Pudina, Paudina, Podina, Pudina, pudinah
Sanskrit	Pudina, putiha, podinika, phudino, podina
Arabic	Fodanaje, Fotanaje, Habaqulhind, Naanaaul-hind, Nana, Nana hindi, Nana yabani
Burmese	Bhudina
Canada	Chetni-maruga
Japan	Midorihakka
Nepal	Nawaghya
Kannada	Chetamargugu, chetni-marugu, chetnimaragu, chetnimaruga
Malayalam	Putina, putiina, puttityana
Marathi	Pudina
Persian	Pudinah
Tamil	Iyeccakkirai, iyeccirkirai, kumarakamuli, potina, potina, potina, pudina, pudinah, puthina, putina, putina, putiyana, putiyanmuli, putiyanputina, yechakkirai
Telugu	Igaenglikoora, igaenglikura, pudina, pudinah
Urdu	Ab-i-podina, arq nana, nana (pudina), podina, podina khushk, podina khusk, podina taza, pudina, pudinah

Botanical Description of Mentha arvensis

Mentha arvensis Linn. belongs to the family Lamiaceae. It is an erect, herbaceous, perennial plant that grows to 20-80 cm on square, hairy stems. It is rhizomatous and has opposite leaves attached to the stem by very short stalks. The leaves of Mentha arvensis Linn. are elliptic to oblong-ovate, short-petioled, with toothed margins and rounded or blunt tips. Diacytic stomata are present on the lower surface of the leaf. The flowers are whorled around the upper leaf axils. They are 4-7 mm long, bilabiate, irregular, and change in color from white to pink to violet. The stamens are longer than the petals. The fruits are brown nutlets [18,19].

Geographical Distribution of Mentha arvensis

Mentha arvensis linn. is found in Eurasia. It is widely growing in subtropical regions. *Mentha arvensis linn*. is found around the north pole, extending as far south as New Mexico. It is native to the regions of Europe, western and central Asia.[20]

Chemical constituent[21,22,23]

Sr. No.	Chemical Constituent	Class of Compound
1	Menthol	Monoterpene Alcohol
2	Menthone	Monoterpene Ketone
3	Menthyl Acetate	Ester
4	1,8-Cineole (Eucalyptol)	Monoterpene Oxide
5	Limonene	Monoterpene Hydrocarbon
6	Pulegone	Monoterpene Ketone
7	Carvone	Monoterpene Ketone
8	Rosmarinic Acid	Phenolic Compound
9	Flavonoids (Luteolin, Hesperidin)	Polyphenolic Compounds
10	Tannins	Polyphenolic Compounds

Pharmacologycal Activity

Antibacterial Activities:

The antibacterial activity varied among the bacterial species tested but was nearly equivalent against both antibiotic-resistant and antibiotic-sensitive strains of H. pylori and S. aureus [24].

Antioxidant Activities:

The antioxidant activity of cineole against ethanol-induced gastric mucosal damage in rats has been investigated. The results revealed that the cineole extract of Mentha arvensis possessed antioxidant activity [25]. Another study reported that flavonoids such as quercetin, which are present in mint, also possess antioxidant activity.

Antifertility Activities:

The antifertility activity of the petroleum ether extract of the leaves of Mentha arvensis was investigated in male albino mice. The extract was administered orally at doses of 10 and 20 mg/day per mouse for 60 days. The petroleum ether extract of Mentha arvensis leaves was found to possess reversible antifertility activity in male mice [26].

Cardioprotective Activity:

The cardioprotective activity of the crude extract of Mentha arvensis and its effects on arachidonic acid metabolism have been investigated. The crude extract inhibited the arachidonic acid metabolite thromboxane B2, which is a stable analogue of thromboxane A2. Mentha arvensis wa s found to possess antiplatelet activity through the inhibition of thromboxane B2 [27].

Anti-allergic and Anti-inflammatory Activity:

The anti-inflammatory and anti-allergic activities of ethanolic and aqueous extracts of the leaves of Mentha arvensis were evaluated against histamine-induced paw edema in mice. The results revealed that the ethanolic extract of the leaves and roots of Mentha arvensis possessed significant anti-allergic and anti-inflammatory activity [28].

TULSI:

Figure 2: Plant of Tulsi

Synonyms : Holy basil, sacred basil.[29]

Biological source : It consists of dried leaves of ocimum santum linn.[29]

Family : Lamiaceae.[30]

Scientific classification[31]

Kingdom	Plantae
Phylum	Spermatophyta (or Angiosperms)
Class	Magnoliopsida (or Dicotyledonae)
Order	Lamiales
Family	Lamiaceae
Genus	Ocimum
Species	Ocimum tenuiflorum or Ocimum sanctum

Vernacular classification[31]

English	Holy basil, Indian basil, Sacred basil
Hindi	Tulsi, Kalatulsi
Sanskrit	Tulasi
Malayalam	Tulasi, Trittavu
Tamil	Tulasi, Thiruneetru pachai
Kannada	Tulasi, Sri Tulasi
Marathi	Tulasi
Telugu	Tulasi, Manchi Tulasi
Gujarati	Tulasi, Damro
Bengali	Tulasi, Krishna Tulasi

Chemical constituent[32,33]

Sr. No.	Chemical Constituent	Class of Compound
1	Eugenol	Phenolic compound
2	Ursolic acid	Triterpenoid
3	Rosmarinic acid	Polyphenol
4	Linalool	Monoterpene
5	Caryophyllene	Sesquiterpene
6	Methyl eugenol	Phenylpropanoid

7	Carvacrol	Monoterpenoid phenol
8	Oleanolic acid	Triterpenoid
9	Apigenin	Flavonoid
10	Ocimene	Monoterpene

Pharmacologycal Activity:

Anticancer activity:

The alcoholic extract (AlE) of OS leaves exerts a modulatory effect on carcinogen-metabolizing enzymes, including cytochrome P450, cytochrome b5, aryl hydrocarbon hydroxylase, and glutathione S-transferase (GST), which play an important role in the detoxification of carcinogens and mutagens [34].

Antioxidant activity:

The antioxidant properties of flavonoids and their association with membrane protection have been documented. The in vivo antioxidant activity of the flavonoids orientin and vicenin was demonstrated by a significant reduction in radiation-induced lipid peroxidation in the mouse liver. The OS extract also exhibited a significant c apacity for scavenging highly reactive free radicals. Furthermore, the phenolic compounds, namely cirsilineol, cirsimaritin, isothymusin, apigenin, and rosmarinic acid, together with appreciable quantities of eugenol, a major component of the volatile oil present in the OS extract of fresh leaves and stems, demonstrated substantial antioxidant activity [30].

Antihypertensive and cardioprotective activities:

The transient cerebral ischemia and long term cerebral hypoperfusion (causing cellular oedema, gliosis and perivascular inflammatory infiltrate) have been prevented by OS. The OS fixed oil administered intravenously produced hypotensive effect in anaesthetized dog, which seems to be due to its peripheral vasodilatory action. Essential fatty acids like linoleic and linolenic acids, contained in the OS oil produce series 1 and 3 (PGE1 and PGE3) prostglandins and inhibit the formation of series 2 prostglandins (PGE2). The long term feeding of OS offers significant protection against isoproterenol-induced myocardial necrosis in Wistar rats through enhancement of endogenous antioxidant.[30]

Hepatoprotective activity:

Oral administration of the hydroethanolic extract of OS leaves at 200 mg/kg in male Wistar albino rats conferred protection against paracetamol-induced hepatic injury [35]. The cold water extract of OS at 3 g/100 g, administered orally for 6 days, was also found to be effective against carbon tetrachloride-induced liver damage at 0.2 ml/100 g, administered subcutaneously, in albino rats [36].

Antiulcer activity:

Intraperitoneal administration of the fixed oil of OS elicited significant antiulcer activity against aspirin-, indomethacin-, alcohol (50% ethanol)-, histamine-, reserpine-, serotonin-, and stress-indu ced ulcers in rats [37]. The fixed oil exhibited s ignificant antiulcer activity, which may be attributed to its lipoxygenase-inhibitory, histamine-antagonistic, and antisecretory effects [38].

CINNAMON:

Figure 3: Cinnamon

Synonyms : Cortex Cinnamon oil Ceylon cinnamon, Saigon cinnamon, Chinese cassia, Cinnamon oil aromaticum.[39]

Biological source : Cinnamon bark is the dried inner bark obtained from young shoots of Cinnamomum verum J. Presl. [39]

Family : lauraceae.[40]

Scientific classification[41,42]

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Laurales
Family	Lauraceae
Genus	Cinnamomum
Species	Cinnamomum verum J. Presl

Vernacular classification[41,42]

English	Cinnamon
Hindi	Dalchini
Sanskrit	Tvak / Darusita
Marathi	Dalchini
Gujarati	Taj
Tamil	Lavangapattai
Telugu	Dalchinachekka
Malayalam	Karuvapatta
Kannada	Dalchini Twak
Bengali	Daruchini

Chemical constituent [41,42]

Sr. No.	Chemical Constituent	Class of Compound
1	Cinnamaldehyde	Phenylpropanoid
2	Eugenol	Phenolic compound
3	Cinnamic acid	Aromatic acid
4	Cinnamyl acetate	Ester
5	Linalool	Monoterpene
6	Coumarin	Benzopyrone
7	β-Caryophyllene	Sesquiterpene
8	Mucilage	Polysaccharide
9	Tannins	Polyphenolic compounds
10	Starch	Carbohydrate

Pharmacologycal Activity

Antioxidant:

The methanolic extract of Cinnamon contains a number of antioxidant compounds that can effectively scavenge reactive oxygen species, including superoxide anions, hydroxyl radicals, and other free radicals under in vitro conditions [43]. The fruit of Cinnamon, an underutilized and unconventional part of the plant, contains a substantial amount of phenolic antioxidants that counteract the damaging effects of free radicals and may confer protection against mutagenesis [44].

Anti-ulcer:

The utilization of Cinnamon extract to inhibit both the growth and urease activity of H. pylori in vitro has been shown in the present study to be more effective than thyme extract.[45] The efficacy of Cinnamon extracts in liquid medium and their resistance to low pH levels may enhance their effect in an environment such as the human stomach.[40]

Antimicrobial:

Antimicrobial activity of cinnamon bark. The volatile gaseous phase of combinations of cinnam on oil and clove oil demonstrated considerable potential to inhibit the growth of spoilage fungi, yeast, and bacteria commonly found on IMF (Intermediate Moisture Foods) when it was combined with a modified atmosphere comprising a high concentration of CO2 (40%) and a low concentration of O2 [40].

Antidiabetic:

Antidiabetic activity of cinnamon has been demonstrated in db/db transgenic mice [4]. 1Subash et al. reported that the oral administration of c innamaldehyde produced a significant antihyperglycemic effect, reduced both total cholesterol and triglyceride levels, and

simultaneously increased HDL-cholesterol levels in STZ-induced diabetic rats. This investigation indicates the potential of cinnamaldehyde as a natural oral agent with both hypoglycemic and hypolipidemic effects [46].

Anti-inflammatory:

Anti-inflammatory activity and cytotoxicity again st HepG2 human hepatocellular carcinoma cell li ne cells have also been reported. Furthermore, the findings indicated that the constituents of C. osmophloeum twigs exhibited significant anti-inflammatory activity by suppressing nitric oxide production in LPS-stimulated macrophages [47].

HONEY:

Figure 4: Honey

Synonyms : Madhu, madh.[48]

Biological source : Honey is viscid and sweet secretion stored in the honey comb by various species of bees. [48]

Family : Apidae. [48]

Scientific classification [49,50]

Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Hymenoptera
Family	Apidae
Genus	*Apis*
Species	*Apis mellifera* (common honey bee)

Vernacular classification [49,50]

English	Honey
Hindi	Shahad
Sanskrit	Madhu
Marathi	Madh
Gujarati	Madh
Tamil	Then
Telugu	Tene
Malayalam	Then
Kannada	Jenu
Bengali	Modhu
Punjabi	Shahad
Urdu	Shehad

Chemical constituent [51,52]

Sr. No.	Chemical Constituents	Approximate Composition / Examples
1	Carbohydrates	Fructose (38.2%), Glucose (31.3%), Sucrose, Maltose, Isomaltose
2	Water	15–20%
3	Proteins & Amino Acids	Proline, Lysine, Phenylalanine, Enzymes
4	Enzymes	Invertase, Diastase, Glucose oxidase, Catalase
5	Organic Acids	Gluconic acid, Acetic acid, Citric acid, Formic acid
6	Vitamins	Vitamin B1, B2, B3, B5, B6, Vitamin C
7	Minerals	Calcium, Potassium, Sodium, Magnesium, Iron, Phosphorus, Zinc
8	Phenolic Compounds	Flavonoids, Phenolic acids, Gallic acid, Caffeic acid
9	Volatile Compounds	Aldehydes, Ketones, Alcohols, Esters
10	Pigments	Carotenoids, Xanthophylls

Pharmacologycal Activity

Antioxidant Activity:

Oxidizing agents such as oxygen are involved in p rocesses related to the prevention of damage and act as antioxidants, which are detected in foods and the human body [53]. Although the function of

natural antioxidants in the human body has not been fully understood, investigations have demonstrated their role in the effects of natural honey on several aging-related processes. Highly reactive components derived from oxygen, namely free radicals and reactive oxygen species (ROS), are generated during metabolism. These components interact with lipids and protein constituents in cell membranes, enzymes, and DNA. Such damaging reactions may lead to various diseases. Fortunately, antioxidants intercept free radicals before they can cause damage. Both enzymatic and nonenzymatic substances contribute to antioxidant protection [54].

Antimicrobial Activity:

The principal factors underlying the antimicrobial activity of honey are the enzymatic glucose oxidation reaction and certain physical properties,[55,56] while additional factors contributing to this activity include high osmotic pressure and low water activity, low pH and acidity, low protein content, a high carbon-to-nitr ogen ratio, low redox potential due to the high concentration of reducing sugars, viscosity that limits dissolved oxygen, and other chemical agents and phytochemicals. Owing to these properties, including low water activity, acidity, glucose oxidase, and hydrogen peroxide, honey does not support the growth of yeasts and bacteria[57].

Apoptotic Activity:

Cancer cells are characterized by inadequate apoptotic turnover and uncontrolled cellular proliferation[58]. Chemical agents used in cancer treatment function as inducers of apoptosis[59]. Honey induces apoptosis in various types of cancer cells through depolarization of the mitochondrial membrane[60,61] . Honey increases caspase-3 activation and poly(ADP-ribose) poly merase (PARP) cleavage in human colon cancer cell lines, which are associated with its high phenolic content [61].

Anti-inflammatory and immunomodulatory activities:

Chronic inflammation may inhibit healing through tissue damage. According to the current literature, honey reduces the inflammatory response in animal models, cell cultures,[62] and clinical trials[63]. The phenolic content of honey is responsible for its anti-inflammatory effect[64].

CONCLUSION:

The present review concludes that Pudina, Tulsi, Cinnamon, and Honey possess significant medicinal value for the treatment and management of cough and related respiratory disorders. These natural ingredients contain a broad range of bioactive compounds, including menthol, eugenol, cinnamaldehyde, flavonoids, and phenolic compounds, which contribute to their antimicrobial, anti-inflammatory, antioxidant, and soothing properties. Herbal cough syrups form ulated with these ingredients offer several advantages, including improved patient compliance, reduced adverse effects, ease of a dministration, and natural therapeutic activity compared with synthetic cough medications. In addition, honey functions as an effective natural preservative and demulcent, thereby enhancing both the efficacy and the palatability of the formulation. The increasing global interest in herbal medicine and traditional remedies further supports the development and utilization of herbal cough preparations. Therefore, these herbal components may be regarded as promising, safer alternatives for cough management and may contribute to the advancement of herbal pharmaceutical formulations.

REFERENCES

1. The text book of "Indian Pharmacopoeia 2022" volume 2, published by the Indian Pharmacopoeia Commission, Ghaziabad.
2. C.G.BUTLER .C.O. Jefferand H. Kalmsted Experimental S and D.B.V college Received 4 July 1943.
3. Swain, P.K. et al., 2013.
4. Kaushik , A ; Chavhan , v : Sudha, (2016) Formulation and Evaluation of herbal cough syrup, EJPMR, 3(5),517-522.
5. Akula , N.P. subramanyam. K.V.Sanym .p,Karthik.s.Madhuri , J.Mounika, G and Tamkanat.f (2017).
6. Mujawar, F.P.Patil, M.K , sawale. J(2016) Formulation and Evaluation of herbal cough syrup form some Herbs used as expectorant WJPPS, 2 (5),3848-3833.
7. Lachman L. Lieberman HAKanig JL. The Theory and practice of Industrial pharmacy.3rd edition Bombay; Varghese publishing House;1987-457p.
8. Carte SJ. Dispensing for pharmaceutical students. 12th edition. New Delhi; CBS publisher and Distributors;2000.67p.
9. Ghiware N.B ; Gattani S.G, Chalikwar SS. Design Development and Evaluation of Piper nigrum and Nyctantherarbortristis. International journal of Pharma Jech Research;2010;2(1);171-176.
10. Ansel HC Allen LV. Pharmaceutical dosage form and drug delivery systems. 7th edition Lippincott;2000-347-356p.
11. Stability Testing for new Dosage forms QIC. (TCH), International conference on Harmonization 1996.
12. Devkar et al.,Formulation and Evaluation of Herbal Syrup. Asian Journal of Pharmaceutical Research and Development. 2021; 9(3): 16-22.
13. A.V. Sharma and p.v Sharma flavouring agent in pharmaceutical formulations a overview article Ancient science of life.
14. Eizbieta Hazar and Alicjawodinika a determination of ethanol content in medicated syrup by static headspace Gas Chromatography Received by 2013.
15. A Text Book of Pharmacognosy dr.c.k. Kokate, s.b.Gokhale, A.P.Purohit by eight addition a drug pudina page no.9.102.
16. Kumar, V. (2021). Phytochemical, pharmacological activities and ayurvedic significances of magical plant Mimosa pudica Linn. Mini-Reviews in Organic Chemistry, 18(3), 296-312.
17. Thakur, S., Walia, B., & Chaudhary, G. (2021). Mentha arvensis (Pudina): A review based upon its medicinal properties. Research journal of Pharmacognosy and Phytochemistry, 13(3), 143-148.
18. Kapoor LD, Krishnan R. Advances in Essential Oil in Industry. New Delhi: Today and Tomorrows Printers and Publishers; 1997. 15.
19. Londonkar RL, Poddar PV. Studies on activity of various extracts of Mentha arvensis Linn against drug induced gastric ulcer in mammals. World J Gastrointest Oncol 2009; 15: 82-8
20. Cooke SS. A field guide to the common wetland plants of western Washington & northwestern Oregon. Seattle Audubon Society; 1997.
21. Khandelwal, K.R. Practical Pharmacognosy: Techniques and Experiments. 23rd Edition, Nirali Prakashan, Pune.
22. Trease, G.E. and Evans, W.C. Pharmacognosy. 16th Edition, Saunders Elsevier, London.
23. Kokate, C.K., Purohit, A.P., and Gokhale, S.B. Pharmacognosy. 55th Edition, Nirali Prakashan.

24. Imai H, Osawa K, Yasuda H, Hamashima H, Arai T, Sasatsu M. Inhibition by the essential oils of peppermint and spearmint of the growth of pathogenic bacteria. Microbios 2001; 106 Suppl 1: 31-9.
25. Santos FA, Rao VS 1,8-cineol, a food flavoring agent, prevents ethanol-induced gastric injury in rats. Dig Dis Sci 2001; 46: 331-7
26. Sharma N, Jocob D. Antifertility investigation and toxicological screening of the petroleum ether extract of the leaves of Mentha arvensis L. in male albino mice. J Ethnopharmacol 2001; 75: 5-12.
27. Saima G, Humaira G, Rukhsana N. Possible mechanism of action of Mentha arvensis in cardiovascular diseases. Int J Endorsing Health Sci Res 2014; 2: 5-10.
28. Farnaz M, Shahzad H, Alia S, Ghazala P, Amina W, Shazia S, et al. Phyto-chemical analysis, anti-allergic and antiinflammatory activity of Mentha arvensis in animals. Afr J Pharm Pharmacol 2012; 6: 613-9
29. A Text Book of Pharmacognosy Dr. C. K.kokate S.B, Gokhale A.P Purohit by eight addition a drug Tulsi Page no.9.82.
30. Pandey, G., & Madhuri, S. (2010). Pharmacological activities of Ocimum sanctum (tulsi): a review. Int J Pharm Sci Rev Res, 5(1), 61-66.
31. Shambharkar, S. B. and Thakare, V. M. (2021). Formulation and Evaluation of Herbal Mouthwash. World Journal of Pharmaceutical Research, 10(9), 775–791.DOI: 10.20959/wjpr20219-20782
32. Pattanayak, P., Behera, P., Das, D., & Panda, S. K. (2010). Ocimum sanctum Linn. A reservoir plant for therapeutic applications: An overview. Pharmacognosy Reviews, 4(7), 95–105.
33. Prakash, P., & Gupta, N. (2005). Therapeutic uses of Ocimum sanctum Linn (Tulsi) with a note on eugenol and its pharmacological actions: A short review. Indian Journal of Physiology and Pharmacology, 49(2), 125–131.
34. Pandey Govind, Madhuri S. Medicinal plants: Better remedy for neoplasm. Indian Drug 43(11):2006,869- 874.
35. Chattopadhyay RR, Sarkar SK, Ganguly S, Medda C, Basu TK. Hepatoprotective activity of O. sanctum leaf extract against paracetamol induced hepatic damage in rats. Indian J Pharmacol. 24:1992,163.
36. Seethalakshmi B, Narasappa AP, Kenchaveerappa S. Protective effect of Ocimum sanctum in experimental liver injury in albino rats. Indian J Pharmacol, 14:1982,63.
37. Singh S, Taneja M, Majumdar DK. Biological activities of Ocimum sanctum L. fixed oil- An overview. Indian J Exp Biol 45:2007,403-412.
38. Singh S, Majumdar DK. Evaluation of the gastric antiulcer activitry of fixed oil-Ocimum sanctum (Holy basil). J Ethnopharmacol 65:1999,13-19.
39. A Text Book of Pharmacognosy Dr.C.K.Kokate, S.B Gokhale A.P. Purohit by eight addition a drug cinnamon Page no.9.118.
40. Jakhetia, V., Patel, R., Khatri, P., Pahuja, N., Garg, S., Pandey, A., & Sharma, S. (2010). Cinnamon: a pharmacological review. Journal of advanced scientific research, 1(02), 19-23.
41. Evans, W. C. (2009). Trease and Evans Pharmacognosy (16th ed.). Saunders Elsevier.
42. Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2010). Pharmacognosy (47th ed.). Nirali Prakashan.
43. Mathew S, Abraham BTE. Food Chemistry, 2006;94:520–528.
44. Jayaprakasha GK, Negi PS, Jena BS, Jagan Mohan Rao L. Journal of Food Composition and Analysis, 2007;20:330–336.

45. Tabak M, Armon R, Neeman I. Journal of Ethnopharmacology, 1999;67:269–277.
46. Subash Babu P, Prabuseenivasan S, Ignacimuthu S. Phytomedicine, 2007;14:15–22.
47. Tung YT, Chua MT, Wang SY, Chang ST. Bioresource Technology, 2008; 99: 3908–3913.
48. A Text Book of Pharmacognosy Dr .C.K.Kokate, S.B.Gokhale, A.P.pirohit by eight addition a drug Honey Page no.9.166.
49. Crane, E. (1990). Bees and Beekeeping: Science, Practice and World Resources. Heinemann Newnes.
50. National Bee Board, Government of India. (2020). Honey and Beekeeping.
51. Bogdanov, S., Jurendic, T., Sieber, R., & Gallmann, P. (2008). Honey for Nutrition and Health: A Review. Journal of the American College of Nutrition, 27(6), 677–689.
52. White, J.W. Jr. (1975). Composition of Honey. In: Honey: A Comprehensive Survey. Heinemann, London.
53. Han DH, Denison MS, Tachibana H, Yamada K. Relationship between estrogen receptor-binding and estrogenic activities of environmental estrogens and suppression by flavonoids. Biosci Biotechnol Biochem. 2002;66:1479–87. doi: 10.1271/bbb.66.1479.
54. Pérez RA, Iglesias MT, Pueyo E, Gonzalez M, de Lorenzo C. Amino acid composition and antioxidant capacity of Spanish honeys. J Agric Food Chem. 2007;55:360–5. doi: 10.1021/jf062055b.
55. Beretta G, Orioli M, Facino RM. Antioxidant and radical scavenging activity of honey in endothelial cell cultures (EA. hy926) Planta Med. 2007;73:1182–9. doi: 10.1055/s-2007-981598.
56. Cushnie TP, Lamb AJ. Antimicrobial activity of flavonoids. Int J Antimicrob Agents. 2005;26:343–56. doi: 10.1016/j.ijantimicag.2005.09.002.
57. Patton T, Barrett J, Brennan J, Moran N. Use of a spectrophotometric bioassay for determination of microbial sensitivity to manuka honey. J Microbiol Methods. 2006;64:84–95. doi: 10.1016/j.mimet.2005.04.007.
58. Boukraa L, Niar A. Sahara honey shows higher potency against Pseudomonas aeruginosa compared to North Algerian types of honey. J Med Food. 2007;10:712–4. doi: 10.1089/jmf.2006.256.
59. Nicholson DW. From bench to clinic with apoptosis-based therapeutic agents. Nature. 2000;407:810–6. doi: 10.1038/35037747.
60. Earnshaw WC. Nuclear changes in apoptosis. Curr Opin Cell Biol. 1995;7:337–43. doi: 10.1016/0955-0674(95)80088-3
61. Fauzi AN, Norazmi MN, Yaacob NS. Tualang honey induces apoptosis and disrupts the mitochondrial membrane potential of human breast and cervical cancer cell lines. Food Chem Toxicol. 2011;49:871–8. doi: 10.1016/j.fct.2010.12.010.
62. Bilsel Y, Bugra D, Yamaner S, Bulut T, Cevikbas U, Turkoglu U. Could honey have a place in colitis therapy? Effects of honey, prednisolone, and disulfiram on inflammation, nitric oxide, and free radical formation. Dig Surg. 2002;19:306–11. doi: 10.1159/000064580.
63. Leong AG, Herst PM, Harper JL. Indigenous New Zealand honeys exhibit multiple anti-inflammatory activities. Innate Immun. 2012;18:459–66. doi: 10.1177/1753425911422263.
64. Al-Waili NS, Boni NS. Natural honey lowers plasma prostaglandin concentrations in normal individuals. J Med Food. 2003;6:129–33. doi: 10.1089/109662003322233530.

HOW TO CITE: Kunal Badole, Pravinkumar Shahare, An Overview of the Pudina, Tulsi, Cinnamon, and Honey used in the Treatment of Cough, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 5, 7952-7964. https://doi.org/10.5281/zenodo.20447297