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Review Article

A brief review on dhoop and its properties

Bhavna Sahu[1], Shweta Dutta[2,*], Saraswati Prasad Mishra[3], Satyendra Khute[4], Lokesh Kumar[5], Anshita Gupta Soni[6], Kirti Dewangan[7]

[1]*Dept. of Pharmacognosy, RITEE College Of Pharmacy, Raipur, Chhattisgarh, India*
[2]*Dept. of Pharmacology, Royal College of Pharmacy, Raipur, Chhattisgarh, India*
[3]*Dept. of Pharmacology, RITEE College of Pharmacy, Raipur, Chhattisgarh, India*
[4]*Dept. of Pharmaceutics, RITEE College of Pharmacy, Raipur, Chhattisgarh, India*
[5]*Dept. of pharmacology, Shri Rawatpura Sarkar Institute of Pharmacy, Chhattisgarh, India*
[6]*Dept. of Pharmacognosy, Shri Rawatpura Sarkar Institute of Pharmacy, Chhattisgarh, India*
[7]*Dept. of Pharmacy, Shri Rawatpura Sarkar Institute of Pharmacy, Chhattisgarh, India*

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ABSTRACT

In today's era the major concern is the change in environment. The increase in pollution has affected the quality of air immensely. Now it is the need of the hour to look around to find options to tackle it. Though there are many chemical approaches but all of them have some side effect associated with them. Present study explains about a potential alternative dhoop to tackle the situation. It explains the different types of incense sticks and dhoops found. Present study also dives in explaining the relief provided by different dhoops in different physical condition. There is explanation about the materials required to prepare a dhoop along with the herbs used. Present study also describes the characterisation test like FTIR, XRD done for the dhoop. Lastly it explains the benefit of dhoop and its uses.

1. Introduction

In today's era the major concern is the change in the environment. The level of constant pollution has drawn the attention of the population. For the survival of human in this planet, the basic need is a clean environment. Clean environment comprises of clean air to breath, clean water for drinking, clean and fertile land and proper source of energy.[1,2] Presence of microbes in the air is the primary cause of many airborne diseases. Pathogens that are responsible for air borne diseases spread through air from infected person to non-infected one through the act of talking, laughing coughing, and sneezing. As per U.S. Centers for Disease Control a droplet of flu has the potential to travel up to six feet. Nowadays, for having clean air to breathe many approaches are implemented to cleanse it. For the same many chemical alternatives are available in the market, but they do have many unwanted effects that can hamper the health of organisms.[3,4] To counteract the unwanted effects of chemicals, herbal products can be taken as an alternative. Herbal products impart properties like fragrance as well as it induces a sense of positivity in the area it is used in addition to serve the purpose of cleansing the air. The current work basically focuses on elaborating the process of development of dhoop sticks, which can be used as an alternative to chemicals for decreasing microbial load in the air. For the preparation of the dhoop sticks all the basic ingredients that are required, are natural. The ingredient includes cow dung, clarified butter, certain herbs, cow milk. Cow dung has always been used as a disinfectant from ages.[5–8] in many religions while performing practices like home or havens , ingredients like cow dung, camphor, urine of cow, cow ghee are used that helps in cleansing the environment and impart

* *Corresponding author*.
E-mail address: Shweta.run46@gmail.com (S. Dutta).

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a feeling of pleasantness.[9–13] By utilizing the traditional knowledge a method has devised by which dhoop sticks can be prepared from economical sources. This dhoop sticks having pharmacopoeial quality can be made from cow product and plant powder and it imparts pleasant smell. These sticks can act as a disinfectant for the air in areas like home, hospitals and washroom.[14–17] Moreover incense sticks can also be formulated from ingredients such as bark, woods, essential oil and gums. Incense sticks are mostly used in places like USA, in the Indian subcontinent and Asian countries.[18] The composition of incense of variety of brands and industries remain the same incense powder. Generally the incense powder is made up of coal powder, woodchip, adhesives along with the fragrance material. Fragrance material found in incense products plays a major role as it helps in providing aroma. Aroma can be of any kind such as rose, mogra, jasmine, chameli.[19–21] Generally these fragrances material basically obtained from plant as plant extracts or chemicals derived from them termed as phytochemical. The materials obtained are organic matter such as poly cyclic hydrocarbons and poly aromatic hydrocarbons and are volatile in nature. When these fragrant materials are burned then it liberates aroma which we feel when incense is burned. These fragrant materials which may include woods, herbs, essential oil, resins are used in incense preparation either singly or in combination also.[22,23] Fragrance material can also be obtained from animal sources but their use can be matter of concerned in many religions. As compared to the fragrance material obtained from plant source, very few of them is obtained from animal source. Among the fragrance material obtained from animal source the most widely used fragrance material is operculum[24], ambergris[25,26] and musk[27] Operculum is a material that is obtained from animals such as snails, mosses, mollusks.[28] The operculum is composed of protein named as "conchiolin".[29,30] Conchiolin is like the protein keratin. Keratin is a protein that is found in nails and horns of animals as well as human beings. Apart from operculum one the more fragrance obtained from animal source is musk which is derived from male musk deer.[31–33] Musk has very heavy aroma and its aroma is compared to smells like woodsy or earthy.[34,35] The name musk is given to it because of the smell it imparts, which is identical to the odor of male musk deer. In addition to the above mentioned fragrance material one more animal derived fragrance material is ambergris. Ambergris is found in the secretion of intestine of sperm whale and it is seen floating on tropical sea surface.[36] in addition to its use as fragrance material in incense it is also used for manufacturing of perfume that is aroma based. The wood chips and coal powders are taken as base material that helps in proper and complete burning of the incense made.[37] Lastly adhesive material plays the role of adhering the incense powder, coal powder a fragrance material to the bamboo sticks. Further, incense sticks can different when it reaches market in marketed from as the giants of incense industries can add some of the secret materials of their trade. In much Indian incense based industries add a material called diethyl phthalate (DEP) to reduce the release of smoke.[38] In some countries' insect repellent is also added to the incense to ensure dual activity of fragrance as well as insect repellent.[39]

2. Different types of Incense and Dhoopbatti in India

2.1. Incense

Traditionally India has been using incense in many occasions which may be of social importance or religious importance.[40] In India incense sticks are referred as agarbatti. Agarbatti is form of incense where bamboo stick holds the incense paste around it. India was first to start preparing incense in a uniform system. In modern system of incense making, medicinal priest performs the responsibility of making incense. In many places of the world a belief system is quite prevalent that burning incense imparts mystical power of healing.[21,41]

2.1.1. Types of incense[42]

There are different types of incense which shows different healing property. Below are few types of incense sticks are mentioned.

1. Dragon's Blood Incense — This incense helps in relieving in conditions like raging fevers, pain of ulcer, stomach virus symptoms, diarrhea etc.
2. Lavender Incense — It provides soothing and calming experience. It is helpful to get relief after a busy stressful day.
3. Sandalwood Incense — It reduces anxiety and induces feeling of spirituality in an individual
4. Indian Cedar Incense — Helps in recovering from mood disorders and depression
5. Amber Incense– the various systems of a body is balanced
6. Patchouli Incense– soothes the nerves and makes them more stronger

2.2. Dhoopbatti

The name Dhoop came from the name of tree called Dhoop which indigeneous to eastern India. A chip from these trees imparts pleasant fragrance when they are burnt. Dhoop or Dhoopbatti is not similar to incense stick or Agarbatti. Even from physical appearance they are different. Incense dry and found as a stick but Dhoop is a found in paste form with little bit of dampness in it.[43]

2.2.1. Different types of dhoopbatti[43]

1. Charcoal Type: In preparation of this kind of dhoopbatti an unscented stick is dipped in mixture

made up of essential perfumes and oils. Additionally charcoal is added that will act as a fuel to burn the dhoop. For the purpose of binding the mixture to the stick black resins are used which impart the property of binding.

2. Masala Dhoop: As the name suggests masala dhoop is made by mixing variety of aromatic ingredients to prepare a solid Dhoopbatti. Then by using water or other adhesives it is made into a sticky paste. Different types of natural ingredients such as sandalwood, rubber resins, natural oils, root extracts, and leaves and stem of different medicinal plants are utilized for preparation of masala Dhoop.

3. Herbs Used in Incense Preparation

As per previously conducted study, the essential oils of the many leaves of like Cymbopogon nardus (Citronella), Cymbopogon citratus (Lemongrass), Ocimum basilicum (Sweet Basil), Ocimum sanctum (Tulsi), Ocimum americanum (Hairy Basil), Eucalyptus citriodora (Eucalyptus), Eucalyptus globulus (Eucalyptus), Curcuma longa (Turmeric) rhizomes, Citrus sinensis (Sweet Orange) peels, Citrus limonum (Lemon) peels, Syzgium aromaticum (Clove) buds and Pinus roxburghii resins have shown effective mosquito repellent action.The extracts of Azadirachta indica (Neem) seeds has the property of mosquito repellents as well as helps in cleaning the atmosphere.[44]

Fig. 1: *Ocimum sanctum (Tulsi)*[45]

Table 1: *Plant profile*

Synonyms	**Sacred basil, Holy basil**
Biological Source	Tulsi consists of fresh and dried leaves of Ocimum sanctum Linn.
Family	Lamiaceae
Chemical constituent	It contain approximately 70% eugenol , methyl eugenol , Carvacrol (3%) and eugenol-methyl-ether(20%)
Uses	The oil is used for antibacterial and insecticidal.

Fig. 2: *Azadirachta indica (Neem)*[45]

Table 2: *Plant profile*

Synonyms	**Margosa**
Biological Source	It consists of all aerial parts of plant known as Azadirechta indica.
Family	Meliaceae
Chemical constituent	Nimbin, Nimbinene, Nimocinol, Quercetin .
Uses	Which have insect repellent, insecticide, antifeedant, nematicide and antimicrobial..

Fig. 3: *Eucalyptus globules (Eucalyptus leaf)*[45]

Table 3: *Plant profile*

Synonyms	**Eucalyptus, Dinkum oil**
Biological Source	Eucalyptus oil is the volatile oil is obtainted by the distillation of the fresh leaves of Eucalyptus globulus and other species of Eucalyptus.
Family	Myrtaceae
Chemical constituent:	Euclyptus oil cheifly contains cineole, also known as eucalyptol (about 80%). It also contains pinene, camphene and traces of phellandrene, citronellal, geranyl acetate
Uses	Eucalyptus oil is used as antiseptic, expectorant and antibacterial properties.

Fig. 4: *Syzygium aromaticum (Clove)*[45]

Table 4: *Plant profile*

Synonyms	**Caryophyllum, Clove flower, Clove buds**
Biological Source	Clove consists of dried flower buds of Syzygium aromaticum
Family	Myrtaceae
Chemical constituent	Clove contains about 15 to 20 % of volatile oil; 10 to 13 % of Tannin (Gallotannic acid), Resin, Chromone and Eugenin
Uses	Clove oil is biological activities such as antibacterial, antifungal, insecticidal and antioxidant properties.It is used for flavouring agent.

Fig. 5: *Mentha piperita (peppermint leaf)*[45]

Table 5: *Plant profile*

Synonyms	**Oleum mentha piperita, Mentha oil**
Biological Source	The oil is obtained by steam distillation of the fresh flowering tops of the plants known as Mentha piperita Linn.
Family	Lamiaceae
Chemical constituent	Peppermint oil contains chiefly 1-menthol to the extent of 70% in free, as well as, in the form of esters, depending upon variety (like American, Japanese, Indian).
Uses	Peppermint has significant antimicrobial and antiviral.

Fig. 6: *Citrus aurantium (Bitter orange peel)*[45]

Table 6: *Plant profile*

Synonyms	**Orange Cortex**
Biological Source	Orange peel is dried or fresh outer part of the pericarp of the ripe or nearly ripe fruits of Citrus aurantium Linn.
Family	Rutaceae
Chemical constituent	Bitter orange peel contains about 2.5% of volatile oil, it also contains several other compounds like hesperidin, iso-hesperidin, neohesperidin, vitamin C and pectin.
Uses	Orange peels are used as stomachic, aromatic and carminative. Orange peel oil is natural insect repellent.

4. Method of Preparation of Incense with

4.1. Cow dung

In this kind of preparation of incense with the help of mortar and pestle, the plant products such as (LemonGrass Oil (Cymbopogon lexuosus), Tulsi (Ocimum sanctum), Neem (Azadirachta indica) along with Maida, Saw dust, Loban (Styrax benzoin), Rui (Calotropis gigantea), Durva grass (Cynodon dactylon), Ashoka (Saraca asoca), etc), were crushed with distilled water and then it is mixed with fresh cow dung. As per publications it has been said that ratio of cow dung and plant paste should be in the ratio of 1:1. After that the mixture is made into incense stick or cards or coils as per need and then the final product can be dried under sun or in oven at 70 degree Celsius.[46]

4.2. Essential oil

For preparation, firstly sandalwood, charcoal powder or white powder, which are base materials are mixed with water. Then to this mixture ghee is added and a wet mass is obtained and different volatile oils such as neem oil, lavender oil or eucalyptus oils are added to wet mass after diving the wet mass into three equal parts. The fragrance material or perfume is added. Then by the help of mould method incense sticks are prepared. In mould method the wet mass is put into a plastic mould of cone shape. After that mould is kept as it is for some period and then mould

is opened. After that cone shaped incense stick is obtained which is kept for 2 days under Sun for drying.[47]

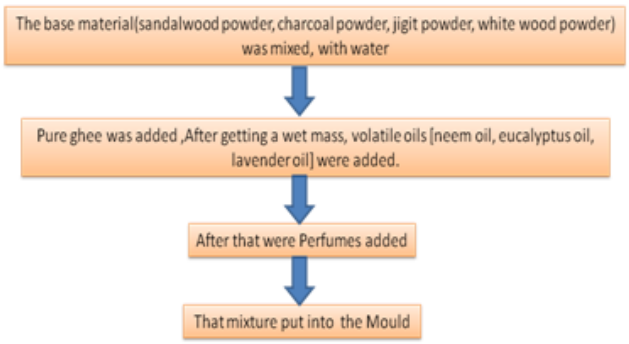

Fig. 7: Method of preparation of incense with essential oil

5. Characterization

Evaluation of chemical properties of incense stick powders is performed by electrical conductivity. pH is determined by use of pH meter. FTIR of incense sticks are done by preparing KBr pellet technique and then the analysis done by Perkin-Elmer, spectrum 6500 with resolution of 2 cm-1. FTIR helps in determining the functional group present in the incense stick powder. XRD analysis is performed for the identification of different phases present in the incense stick powder. XRD analysis verifies whether there is amorphous phase and crystalline phase in incense stick powder. XRD pattern can be recorded using Philips X'PERT PRO instrument equipped X'celerometer in the 2θ range of 20-70 with a step size of 0.02 and a time of 5 seconds per step at 40 kV and a current of 30 mA.[48]

6. Benefits of Using Dhoop[49]

1. Dhoop imparts benefits to body, mind and soul. Dhoop incense is known to improve concentration that can help us while studying, doing meditation and it also prevents infections, relieves headaches, fights depression, and reduces anxiety and tension.
2. Dhoop sticks due to its soothing fragrances helps in calming the mind as well as creates a peaceful atmosphere around.
3. The resins and herbs used in preparation of Dhoop sticks, are having beneficial effects on patients of asthma, bronchitis and cold.

7. Uses of Incense and Dhoop

7.1. Antimicrobial

Dhoop are known to impart antimicrobial activity. Antimicrobial are referred to the agents which has the ability to either kill or stop the growth of microbes.[1] Antimicrobial medicines are classifies based the microorganisms they act on. For example, antibiotics are used against bacteria and antifungals are used against fungi. Antimicrobials are also classified according to their function. Agents capable of killing the micro-organism are termed as microbicidal, and others who stop their growth are known as biostatic. As incenses are prepared from many herbs that have microbial property, so it imparts anti-microbial activity.[50]

7.2. Mosquito Repellent

Mosquitoes are one the major vectors of many deadly diseases. A mosquito sucks the blood from human beings and in turn causes disease in them. Several mosquito species belonging to genera Anopheles, Culex and Aedes are vectors for the pathogens of various diseases like Dengue fever, Malaria, Yellow fever and several other infections. Dhoop with mosquito repellant property can help in acting on this vector and impart relieve to human beings.[51]

8. Limitation of Dhoop

Although dhoop shows many advantages whereas there is a disadvantage associated with it is that in few individuals it allergic conditions like dermatitis as dhoop or incense enhances the risk factor for elevation of IgE in blood. However to have a clear picture further study has to be conducted. Meanwhile while using incense or dhoop, ventilation of the room should be taken into consideration so that the unwanted effect of the incense or dhoop can be under control.[37]

9. Conclusion

As air borne diseases are quite prevalent now a days so there is a need to have air with low microbial load to reduce the incident of air borne diseases. Presently many chemical alternatives are used to deal with the situation, but they also impart many side effects. In present scenario dhoop with antimicrobial property can act as a savior. Moreover in countries like India, where most of our functions and social gathering start with lighting a dhoop or incense stick, it can perform dual functions. Additionally, the cost to prepare dhoop is quite economical and can be bear by anyone so it can be a better option against the costly chemical alternatives. Present work tries to conclude that if a focused approach is taken towards manufacturing of dhoop by using natural ingredient then it can be a potential market in future.

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11. Conflict of Interest

None.

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Author biography

Bhavna Sahu, Assistant Professor

Shweta Dutta, Assistant Professor

Saraswati Prasad Mishra, Assistant Professor

Satyendra Khute, Assistant Professor

Lokesh Kumar, Assistant Professor

Anshita Gupta Soni, Associate Professor

Kirti Dewangan, Student

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