International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 4 July-Aug 2022, pp: 151-154 www.ijprajournal.com ISSN: 2456-4494

# Assessment of efficacy of oleo-gum resin of Commiphora wightii(Guugul) fumes against microbes- fungi

Neelu Singh* and Garima Sharma **
**Tropical Forest Research Institute, Jabalpur*
*P.O.R.F.R.C. Jabalpur (M.P.)-482001*
*** Deputy Director Research, Motherhood University, Roorkee*

Submitted: 01-07-2022 Accepted: 10-07-2022

**ABSTRACT:**
The potential offumes ofoleo-gum resin of Commiphora wightii (Guggul)on air microbes-fungi were assessed by Petri plate exposure method. The petri plates were placed at different distances (1 to 4 meter) and exposed before and after experiment (30min) ,incubated at ambient temperature regimes and colony count was taken after incubation. The study indicates the significant reduction in fungal colonies after fumigation compared to the control (before fumigation). The number of fungal colonies in different plates observed in the room during summer,winter and rainy seasons after fumigation varied 0.00 to 33.33,0.00 to 36.67 and 0.00 to 100%,respectively.The reduction % of fungal population in different seasons varied 66.09-90.14, 53.44-93.34 and 53.44-93.34% in summer, winter and rainy season, respectively. No significant variation was observed in winter and rainy seasons. The result from the assessment of efficacy on fungal flora support the medicinal claims of Oleo-gum resin of C.wightii as mentioned in Ayurveda and other pharmacopeias.

**Keywords:**chemical fumigants,microbial contamination,micro-flora,Commiphora wightii,fungal population

## I. INTRODUCTION:

Many studies have been conducted to assess the quality of microbial indoor in environments of different places-labs, kitchen, shops etc., a high concentration of bacteria and fungi aerosols has been detected [1,2].

The concerns about microbiological hazards to the health of laboratory workers in lab activities has persuaded the government and the official bodies to investigate the causes of these infections aswell as the prophylactic steps that can be taken against common laboratory infections, such as tuberculosis, diphtheria and streptococcal infections [3,4].

A review published by the World Health Organization on some epidemiological studies showed adequate evidence for the association between indoor dampness-related factors and a wide range of effects on respiratory diseases, including asthma development, asthma exacerbation, current asthma, respiratory infections, upper respiratory tract symptoms, cough, wheeze, and dyspnoea [5].

Several plants produce possess many bio-chemicalsand having biological functions, including defense against insects, fungi and herbivores mammals. The use of different plant fumes for air purification is well documented in our ancient literature.

Vruksh Ayurveda describes in its 53 versesthe various plants which were used for fumigation purposes alone or along with yagyas. It enlists about 32 different plant materials which were supposed to be inhaled for illness of various body parts of humans and animals [6].

An oleo-gum resin exuded by the plant Commiphora wightii (Burseraceae),Guggul is used as medicine about 5000 years ago. The resin has a fragrant aroma because of the presence of essential oils and other biochemicals. It is found highly efficacious in treatment of several diseases-obesity, arthritis, inflammation, cardiovascular, skin diseases and disorder of lipid metabolism [7,8,9,10]. It is also one of the important ingredient of Hawan Samagri.

Keeping these facts in mind present study was undertaken to assess the efficacy of Guggul fumes on microbes-fungi.

## II. MATERIALS AND METHODS:

**Testing of microbial activity-**

The experimental site used for bio-fumigation was divided into three different

International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 4 July-Aug 2022, pp: 151-154 www.ijprajournal.com ISSN: 2456-4494

locations and labeled as, 1,1.5,2,2.5,3,3.5 and 4feet. Bio-fumigation was carried out by burning of 10gm Guggul with fumigation catalyst viz., plants powder, cow dung cake. The microbial count at each locale before and after fumigation was investigated by exposure of platesfor 30 min. The experiment was carried out in five replicates and the results were expressed in terms of mean CFU.The petriplates were exposed before and after for 30 minutes in the room air.

**PREPARATION OF MEDIA:**

- 39 gm of Potato Dextrose Agar media was weighed and dissolved in 1000 ml of distilled water.
- 1 ml of the crude extract was added to this 1000 ml media.
- The media was sterilized in an autoclave at 15 lbs pressure for 20 minutes.
- Finally the warm media was poured into the Petri dishes and allowed to set overnight.

## III. RESULTS

The observations regarding efficacy of oleo-gum-resin on air quality-microbes (fungal population) is depicted in Table 1.Significant variation (P=0.05) in colony forming units (CFU) were observed at different distances and before and after fumigation in different seasons.

Medium plates (PDA) were open in the room before and after burning of resin and incubated for 7days to grow fungal population. The number of fungal colonies in different plates observed in the room during summer,winter and rainy seasons after fumigation varied 0.00 to 33.33,0.00 to 36.67 and 0.00 to 100%,respectively.

These results show that the fungal population reduced virulence when fumigated with Guggul resin. Also, the inhibition rate in the room was remarkably decreased (from 33 CFU to 8.3 CFU) after exposure to the Guggul fumes. In the room, the number of CFU before exposure to the incense varied 1 to 13 over control (before fumigation).The reduction% of fungal population in different seasons varied 66.09-90.14, 53.44-93.34 and 53.44-93.34% in summer, winter and rainy seasons,respectively. No significant variation was observed in winter and rainy seasons.

## IV. DISCUSSION

The Guggul fumes was found to be effective in all seasons and its positive effects were not at all altered by the changes in season. In rainy season when the atmosphere is

Saturated with humidity then also fumes was found effective significantly and reduce the air fungal spora.The present study reveals that C.wightii oleo-gum resin is an effective antifungal agent. The reduction in the microbial load in the air due to fumes might be due to the presence medicinal volatiles or antimicrobial chemicals released on burning of resin. It may be a powerfulweapon to check the atmospheric pollution.The effect of burning natural substances to eliminate environmental microbes has been confirmed by different studies[11,12].The positive effect of benzoin resin fume on microbes has been observed in other studies that used different types of incense extracts on environmental microbes [13].The observation of present study are in accordance with the findings of several workers, suggested to use herbal products as ingredient of hawanmaterial to create pure, hygienic and healing atmosphere. Mono and multi-ingredient herbal remedies administered as smoke were documented.The effect of burning natural substances to eliminate environmental microbes has been confirmed by different studies[14,15].

**Table 1 Effect of fumes on number of fungal colonies obtained on PDAplates, exposed in different seasons**

| Distance (meter) | % ofcolonies recorded in different seasons after fumigation | | |
|---|---|---|---|
| | Rainy | Winter | Summer |
| 1 | 50 | 20 | 11.11 |
| | 00 | 00 | 25 |
| | 00 | 33.33 | 12.5 |
| | 00 | 00 | 20 |
| | 00 | 00 | 28.57 |
| Mean | 10 | 10.67 | 19.43 |
| 1.5 | 00 | 00 | 00 |
| | 50 | 33.33 | 16.67 |
| | 00 | 100 | 42.85 |
| | 50 | 20 | 14.28 |
| | 00 | 00 | 00 |

International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 4 July-Aug 2022, pp: 151-154 www.ijprajournal.com ISSN: 2456-4494

| | | | |
|---|---|---|---|
| Mean | 20 | 30.67 | 14.76 |
| 2.0 | 33.33 | 20 | 33.33 |
| | 00 | 00 | 00 |
| | 00 | 25 | 28.57 |
| | 100 | 25 | 14.28 |
| | 00 | 00 | 33.33 |
| Mean | 26.67 | 14 | 21.90 |
| 2.5 | 00 | 50 | 33.33 |
| | 00 | 00 | 00 |
| | 100 | 33.33 | 00 |
| | 00 | 25 | 22.22 |
| | 33.33 | 25 | 14.28 |
| Mean | 26.67 | 36.67 | 13.96 |
| 3.0 | 00 | 40 | 25 |
| | 00 | 00 | 22.22 |
| | 33.33 | 33.33 | 8.33 |
| | 00 | 50 | 23.07 |
| | 00 | 00 | 9.09 |
| Mean | 6.67 | 24.67 | 17.54 |
| 3.5 | 33.33 | 00 | 16.67 |
| | 20 | 20 | 9.09 |
| | 00 | 00 | 37.5 |
| | 50 | 25 | 22.22 |
| | 00 | 16.67 | 12.5 |
| Mean | 20.67 | 12.33 | 19.59 |
| 4.0 | 00 | 40 | 18.18 |
| | 00 | 00 | 00 |
| | 25 | 25 | 11.11 |
| | 00 | 00 | 00 |
| | 50 | 25 | 20 |
| Mean | 15 | 18 | 9.85 |
| CD(0.05) | 5.07 | 12.07 | 3.98 |

## V. CONCLUSION

This study concludes that Commiphora wightii, oleo-gum resin fumes has potential chemicals to reduce microbes significantly. Considering the hazardous effect of carcinogenic chemical fumigation, plants bio-chemicals may be the most lucrative alternative to combat the notorious microorganism present in air, Guggul chemicals can be utilize for the development of natural fumigants.

## REFERENCES

[1]. Hayleeyesus, Samuel Fekadu, and Abayneh Melaku Manaye,2014, "Microbiological quality of indoor air in universitylibraries." Asian Pacific Journal of Tropical Biomedicine, Vol. 4, 2014, pp. S312-7.

[2]. Stryjakowska-Sekulska, M.,2007, "Microbiological quality of indoor air in university rooms." Polish Journal ofEnvironmental Studies, Vol. 16, No. 4, pp. 623-32.

[3]. Collins,1983, Laboratory acquired infections, history, incidence, causes and prevention, 3rd edition,Cambridge university press, UK, 116-20.

[4]. Sewell, DC., **1995,**Clinical microbiological review, , 8 (3), 389-402.

[5]. Heseltine, Elisabeth, and Jerome Rosen,2009, eds. WHO guidelines for indoor air quality: dampness and mould. WHORegional Office Europe, 2009.

[6]. Nene YL, 2014, Fumigation of plant in Vrikshayurveda , Indian Agri-history,18 (1): 23-41.

[7]. Dev, S.,1999, Ancient-modem concordance in Ayurvedic plants: some examples. Environment Health Perspectives, 107, 783-

789.
[8]. Nautiyal Chandra Shekhar, Puneetsinghchauhan,1982, Yeshwantlaxman
[9]. Satyavati GV. 1988,Gum guggul (Commiphora mukul)-The success of an ancient insight leading to a modern discovery. Indian J Med., 87,327-35.
[10]. Wahab, Atqah Abdul, and Ossamaa Mostafa.2007, "Arabian incense exposure among Qatari asthmatic children. A possible risk factor." Saudi Medical Journal, Vol. 28, No. 3, pp. 476-
[11]. Abdallah, Emad M., and Amna E. Khalid,2012, "A preliminary evaluation of the antibacterial effects of Commiphora molmol and Boswellia papyrifera oleo-gum resins vapor." International Journal of Chemical and Biochemical Sciences, Vol. 1, pp. 1-15.
[12]. Alhussaini, Mohammed S.,2015, "An evaluation of the Antimicrobial activity of Commiphora myrrha Nees(Engl.) oleo-gum resins from Saudi Arabia." Journal of Medical Sciences, Vol. 15, No. 4, pp. 198.
[13]. Kulhari Alpana, Arun Sheorayan,Navneet Saxena,Chander Mohan,Manisha Mangal,Ashok Chaudhury,Ashok K. Dhawan and Rajwant K. Kali.,2013, HPTLC analysis of guggulsterone isomers in Commiphora wightii (Arn.) Bhandari: an endangered oleo-gum resinspecies heading towards extinction. Genet Resour Crop Evol., 60,1173–1180.
[14]. Hanif, Muhammad Asif, 2011,. "Essential oil composition, antimicrobial and antioxidant activities of unexplored Omani basil." Journal of Medicinal Plants Research, Vol. 5, No. 5, , pp. 751-7.
[15]. Mohagheghzadeh A, Faridi P, Shams-ardakani M,Ghosemi, Y.,2006,Medicinal smokes, Journal of Ethnopharmacology, 108 920, 161-184.