EFFECT OF AGNIHOTRA FUMES ON AEROMICROFLORA

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INTRODUCTION

Airborne transmission is an important route of transmission of infectious diseases. (WHO, 2004) The main source of infection is aeromicroflora associated with laboratories which can cause respiratory problems. Presently, chemical fumigation is used as an adjunct to environmental cleaning of hospital isolation rooms and other critical areas. Chemical fumigation is a procedure that reduces the level of microbial contamination. It can be done by using various chemical fumigants viz; Formaldehyde gas, Hydrogen peroxide, Chlorine dioxide etc. (Fink et al., 1988; Klapes and Vesley, 1990; Vesley et al., 2001; Knapp and Battisti, 2001). However, Chemical fumigation is effective, it poses lots of hazardous effect and causes serious illness and death. The Centers for Disease control and prevention (CDC) does not recommend chemical fogging to reduce airborne infections in routine patient care area. In contrast, Biofumigation is an effective, safe, inexpensive and ecofriendly technique for air disinfection. Hence, focusing, on an ancient knowledge for disinfection of air, present study with the Agnihotra fumes on aeromicroflora of laboratory was carried out. The hawana was carried by Samidha using Palasa (Butea monosperma), Pimpal (Ficus religiosa), Udumbara (Ficus racemosa), Shami (Prosopis spicigera), Darbha (Desmostachya bipinnata), Rui (Calotropis gigantean), Khair, (Acacia chundra) Aghada (Achyranthes aspera) and Durva (Cynodon dactylon). The study indicates the decrease in growth response of aeromicroflora. Percent reductions of microbial count were 43, 30.84 and 56.07% for Bacteria Fungi and Actinomycetes respectively. Study enlight the possible scientific utility of Agnihotra for air disinfection to control respiratory infection.

KEYWORDS
Agnihotra
Biofumigation
Ecofriendly
Air disinfection

ABSTRACT
Respiratory infections are the major cause of mortality and morbidity among the World population. Hence, with the view to control, the chemical fumigation is used as an adjunct to environmental cleaning of hospital rooms and other critical areas. However, chemical fogging possesses lots of hazardous effect and causes serious illness and death. The centers for Disease control and prevention (CDC) does not recommend chemical fogging to reduce air borne infections in routine patient care area. In contrast, Biofumigation is an effective, safe, inexpensive and ecofriendly technique for air disinfection. Hence, focusing, on an ancient knowledge for disinfection of air, present study with the Agnihotra fumes on aeromicroflora of laboratory was carried out. The hawana was carried by Samidha using Palasa (Butea monosperma), Pimpal (Ficus religiosa), Udumbara (Ficus racemosa), Shami (Prosopis spicigera), Darbha (Desmostachya bipinnata), Rui (Calotropis gigantean), Khair, (Acacia chundra) Aghada (Achyranthes aspera) and Durva (Cynodon dactylon). The study indicates the decrease in growth response of aeromicroflora. Percent reductions of microbial count were 43, 30.84 and 56.07% for Bacteria Fungi and Actinomycetes respectively. Study enlight the possible scientific utility of Agnihotra for air disinfection to control respiratory infection.

MATERIALS AND METHODS

Collection of plants
Total Nine plants viz; Palasa (Butea monosperma), Pimpal (Ficus religiosa), Udumbara (Ficus racemosa), Shami (Prosopis spicigera), Darbha (Desmostachya bipinnata), Rui (Calotropis gigantean), Khair, (Acacia chundra) Aghada (Achyranthes aspera) and Durva (Cynodon dactylon) (Subrahmanya Prasad and Raveendran, 2010) used in different hawana were collected and authenticated from the “Vedang Pratishthan” located at Akola (MS), India.

Selection of site for Biofumigation
The experimentation on aeromicroflora was carried out in Microbiology Laboratory, having dimensions 22 x 32 (704 sq. ft.). The analyses were carried out at the height of 3.4 feet where the routine microbiological work is carried-out.

In Lab experimental design
The experimental site used for Biofumigation was divided into five different locales and labeled as, L1, L2, L3, L4 and L5, representing the aero-space of the whole laboratory. Biofumigation was carried out by burning the mixture of selected plant with fumigation catalyst viz ghee, cow dung cake (Rengaramanijum et al., 2009). The microbial count at each locale before and after fumigation was investigated adopting setting plate device with 15min exposure time. The experiment was carried out in triplicates and the results were...
RESULTS AND DISCUSSION

In present study, effect of Agnihotra fumes was investigated on the aeromicroflora of the laboratory. Table 1 represents the aeromicroflora status of the laboratory before fumigation at different locations viz. L1, L2, L3, L4 and L5. The Bacterial and Fungal count was found to be maximum (306 and 28 cfu/15min.) at location 5. However, the minimum count was obtained at location 1. While Actinomycetes were found to be maximum (76) at same location. It may be due to the diversified metabolic activities of Actinomycetes (Anantnarayan and Panikar, 2008). Hence, maximum mean microbial status at location 5 (392 cfu/15min.) was recorded.

Table 2 represents the aeromicroflora status after Agnihotra fumigation. It was observed that at each locale, there was marked decrease in the mean microbial status comparatively with the count recorded before fumigation. It was 146, 177, 204 and 166 cfu/15min respectively before fumigation while after fumigation it reduces to 72, 16.6 and 29 cfu/15min respectively. The medicinal fumes emanating from Agnihotra help in eradication of microorganisms which are the root causes of illness and diseases.

Table 1: Aeromicroflora status before fumigation (location wise mean)

<table>
<thead>
<tr>
<th>Microflora</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Location 3</th>
<th>Location 4</th>
<th>Location 5</th>
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<tbody>
<tr>
<td></td>
<td>R1 R2 R3 Mean</td>
<td>R1 R2 R3 Mean</td>
<td>R1 R2 R3 Mean</td>
<td>R1 R2 R3 Mean</td>
<td>R1 R2 R3 Mean</td>
</tr>
<tr>
<td>Bacteria</td>
<td>50 30 50 50</td>
<td>80 100 69 83</td>
<td>166 114 80 120</td>
<td>90 78 60 76</td>
<td>540 258 120 306</td>
</tr>
<tr>
<td>Fungi</td>
<td>18 20 22 20</td>
<td>30 27 21 26</td>
<td>40 15 11 22</td>
<td>12 20 40 24</td>
<td>13 33 38 28</td>
</tr>
<tr>
<td>Actinomycetes</td>
<td>30 120 78 76</td>
<td>94 70 40 68</td>
<td>95 50 41 62</td>
<td>50 90 58 66</td>
<td>40 45 89 58</td>
</tr>
<tr>
<td>Mean</td>
<td>118 170 150 146</td>
<td>208 194 129 177</td>
<td>332 148 132 204</td>
<td>152 188 158 166</td>
<td>591 338 247 392</td>
</tr>
</tbody>
</table>

Table 2: Aeromicroflora status after fumigation with Agnihotra (location wise mean)

<table>
<thead>
<tr>
<th>Microflora</th>
<th>Location 1</th>
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<td>R1 R2 R3 Mean</td>
</tr>
<tr>
<td>Bacteria</td>
<td>61 19 10 30</td>
<td>50 58 78 62</td>
<td>80 20 104 68</td>
<td>40 120 50 70</td>
<td>180 125 85 130</td>
</tr>
<tr>
<td>Fungi</td>
<td>5 6 16 9</td>
<td>30 13 5 16</td>
<td>12 17 22 17</td>
<td>21 10 11 14</td>
<td>34 21 26 27</td>
</tr>
<tr>
<td>Actinomycetes</td>
<td>16 8 36 20</td>
<td>44 28 18 30</td>
<td>30 37 17 28</td>
<td>23 58 24 35</td>
<td>67 10 19 32</td>
</tr>
<tr>
<td>Mean</td>
<td>82 33 62 59</td>
<td>124 99 101 108</td>
<td>122 74 143 113</td>
<td>84 188 85 119</td>
<td>281 156 130189</td>
</tr>
</tbody>
</table>

Microbial count expressed in cfu/15min. at dist. 3.4 feet from base

Figure 1: Pooled mean of aeromicroflora before and after fumigation

Figure 2: Percent (%) reduction of Aeromicroflora after Agnihotra fumigation

They suggested that apart from air disinfection the Agnihotra fumes also creates pure hygienic, nutritional and healing atmosphere.

FIG. 1 represents the pooled mean of aeromicroflora before and after fumigation. The pooled mean of Bacteria, Fungi and Actinomycetes were found to be 127, 24 and 66 cfu/15min., min respectively before fumigation while after fumigation it reduces to 72, 16.6 and 29 cfu/15min respectively. The medicinal fumes emanating from Agnihotra help in eradication of microorganisms which are the root causes of illness and diseases.

FIG. 2 represents percent reduction of total microbial count after fumigation which was 43, 30.84 and 56.07% respectively for Bacteria, Fungi and Actinomycetes. Agnihotra fumes were found to be very effective for reducing Actinomycetes followed by Bacteria and Fungi. These results are in accordance with the workers working on same line of research (Mondkar, 1982). They reported that Agnihotra fumes works to reduce aeromicroflora as well as agnihotra ash showed the potentiality to heal the wounds and scabies. Treatment with agnihotra improves germination of rice (Heisnam Jina Devi et al., 2004) grape seeds and also quality of grape raisins. (Bhujbal, 1981) Medicinal fumes emanating from the process of agnihotra have been observed by researchers in the field of Microbiology to be clearly bacteriostatic in nature, which eradicate bacteria...
and micro-organisms, the root causes of illness and diseases (Yug Nirman Yojna, 1998).

Hence, considering the hazardous effect of chemical fumigation, Agnihotra fumes may be the most lucrative alternative to combat the notorious microorganism present in air. The reduction in the microbial load in the air due to agnihotra fumes might be due to the medicinal volatiles or antimicrobial nanoparticles released. Hence, the Agnihotra fumes can be not only use for the disinfection of air but also it can be environmentally exploited for the physical, mental, intellectual and spiritual development by implicating R and D based on nanotechnology of Agnihotra.

REFERENCES


