

**NOTE****Antibacterial Activity of Diethyl Ether  
Extract of *Calocybe indica***

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The antimicrobial properties of diethyl ether extract of *Calocybe indica* was investigated against ten infectious bacterial strains. The extract of *Calocybe indica* showed better antibacterial activity against *Ps. aeruginosa*, *Klebsiella pneumoniae*, *Salmonella typhi*, *Streptococcus* sp. using both disc diffusion and agar well methods.

**Key Words:** *Calocybe indica*, Soxhlet extraction, Disc diffusion, Agar well technique.

For thousands of years, eastern cultures have revered mushrooms as both food and medicine. Tradition has it that there are more than 50 species with healing properties. When used as medicine, mushrooms are made into soup or tea or taken as a tonic or elixir. Studies conducted over the past 30 years mostly in Asia have provided data on the mushrooms, may aid in the treatment of certain types of cancer, boost the immune system and reduces the risk of coronary heart disease. Fruit bodies of *Agrocybe cylindracea* mushroom found to be medicinally active in several therapeutic effects such as antitumor, antibacterial, antifungal, nerve tonic, hypercholesterolemia and hyperlipidemia<sup>1,2</sup>. In the present study, antibacterial activity of *Calocybe indica* mushroom was tested against ten infectious bacterial strains.

The mushroom *Calocybe indica* was selected to study the antibacterial activity against ten infectious bacteria such as *E. coli*, *Enteriobacter* sp., *Ps. aeruginosa*, *K. pneumoniae*, *S. typhi*, *Streptococcus* sp., *V. cholerae*, *S. aureus*, *S. dysenteriae* and *S. paratyphi-B*.

10 g of dried *Calocybe indica* samples was extracted in the Soxhlet extractor for extraction of bioactive compounds<sup>3</sup>. Diethyl ether was used to extract the bioactive components of the mushroom samples<sup>4</sup>. The extract

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of mushroom samples was incorporated into sterile disc with 200 µL of the extract using micropipette. Assay of the antibacterial activity of the medicinal mushroom extract was done by disc diffusion and agar well techniques using Muller Hinton agar. In this technique, bacterial strain was smeared on the surface of the agar plates<sup>5</sup>. Then the plates were incubated at 37 °C for 12-18 h. The inhibition zone formation was observed and recorded.

The level of inhibitory activity varies widely on different bacterial species for mushroom samples. In disc diffusion technique, *Calocybe indica* sample showed better antibacterial activity against *Ps. aeruginosa* (17 mm) and *K. pneumoniae* (17 mm) followed by 15 mm in *S. aureus*. Moderate antibacterial activity was observed in *E. coli* (12 mm), *Enterobacter* sp. (11 mm), *S. typhi* and *Streptococcus* sp. (11 mm). The lowest inhibitory activity was recorded in *S. dysenteriae* with 8 mm (Table-1). The antibacterial activity of mushroom samples of above results was correlated with previous findings by Darokar *et al.*<sup>6</sup> and Zheleva *et al.*<sup>7</sup>.

TABLE-1  
ANTIBACTERIAL ACTIVITY OF *Calocybe indica* AGAINST  
PATHOGENIC BACTERIA (THE INHIBITION ZONE IS  
REPRESENTED IN mm)

Name of the bacteria	Disc diffusion technique (mm)	Agar well method (mm)
<i>E. coli</i>	12	8
<i>Enterobacter</i> sp.	11	7
<i>Ps. aeruginosa</i>	17	14
<i>K. pneumoniae</i>	17	18
<i>S. typhi</i>	11	15
<i>Streptococcus</i> sp.	11	15
<i>V. cholerae</i>	9	8
<i>S. aureus</i>	15	9
<i>S. dysenteriae</i>	8	6
<i>S. paratyphi</i> B	10	7

In agar well technique, the maximum inhibition zone was observed in *K. pneumoniae* (18 mm) followed by *S. typhi* and *Streptococcus* sp (15 mm each). Moderate activity was recorded against *Ps. aeruginosa* with 14 mm. The minimum inhibitory zone was shown in *S. dysenteriae* with 6 mm (Table-1). This compared well with earlier studies by Majundar<sup>8</sup>, Thomas *et al.*<sup>9</sup>, Zheleva *et al.*<sup>10</sup>.

The current research work was started using Shiitake mushrooms as a possible therapy for HIV infections. Thus, the results of the present study confirm the presence of antibacterial activity in the medicinal mushroom

sample investigated using disc diffusion and agar well methods. The active principle (chemicals) of extract which is responsible for antibacterial activity remains to be elucidated by further studies.

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