

**NOTE****Antiyeast Activity of Ethanolic Extract of *Bjekandera adusta***

BASARAN DULGER\*, NURCIHAN HACIOGLU and ILGAZ AKATA  
Department of Biology, Faculty of Science & Arts,  
Canakkale Onsekiz Mart University, 17100 Canakkale, Turkey  
E-mail: basarandulger@yahoo.com

Ethanolic extract of *Bjekandera adusta* (Willd.) P. Karst. was investigated for its antiyeast activity against *Hanseniaspora guilliermondii*, *Rhodotorula rubra*, *Kluyveromyces fragilis*, *Kluyveromyces marxianus*, *Debaryomyces hansenii*, *Candida albicans*, *Candida glabrata*, *Candida utilis* and *Cryptococcus neoformans* by disc diffusion method. The extracts had strong effects against *Candida albicans* and *Cryptococcus neoformans*, but weak activity was seen against the other yeast cultures used in present study.

**Key Words:** Antiyeast activity, *Bjekandera adusta*.

Mushrooms are rich sources of natural antibiotics. In mushrooms, the cell wall glucans are well-known for their immunomodulatory properties and many of the externalized secondary metabolites combat bacteria and viruses<sup>1</sup>. In the present study, antiyeast activity of *Bjekandera adusta* (Willd.) P. Karst. (Polyporales) were tested against some yeast cultures.

The macrofungus was dried in an oven at 40 °C (12 h) and powdered. The macrofungus extracts were obtained by extracting dried powdered parts (50 g) with 95 % ethanol (200 mL) for 48 h<sup>2</sup>. The extracts were then filtered through a Buchner funnel and the solvent was removed under reduced pressure at 60-65 °C on a rotary evaporator. The extract was removed and dried completely at 37 °C, kept at 4 °C in a dessicator and tested for antiyeast activity within 10 d after preparation. Antiyeast activity tests were performed using the NCCLS standard procedure<sup>3,4</sup> against the following microorganisms: *Hanseniaspora guilliermondii*, *Rhodotorula rubra*, *Kluyveromyces fragilis*, *Kluyveromyces marxianus*, *Debaryomyces hansenii*, *Candida albicans*, *Candida glabrata*, *Candida utilis* and *Cryptococcus neoformans*.

Antiyeast activity was determined based on the inhibitory zones around the colonies (Table-1). The ethanolic extract of *B. adusta* showed antiyeast effect against all tested the yeast cultures with inhibition zone ranged from 11.2-15.8 mm. The extract showed better antiyeast activity against *Candida albicans* (15.8 mm), followed by *Cryptococcus neoformans* (15.4 mm). A moderate activity was seen against *Candida glabrata* (13.8 mm). The extract has weak activity against the other yeast

---

\*Department of Biology, Faculty of Science, Ankara University, Ankara, Turkey.

cultures (< 13.0 mm). These values are far below than the standard antifungal anti-biotic clotrimazole.

TABLE-1  
ANTIYEAST ACTIVITY OF *Bjenkandera adusta*

| Microorganisms                      | Zone of inhibition (mm)* |            |
|-------------------------------------|--------------------------|------------|
|                                     | EtOH extracts            | Standard** |
| <i>Hanseniaspora guilliermondii</i> | 11.4                     | 20.2       |
| <i>Rhodotorula rubra</i>            | 12.7                     | 18.2       |
| <i>Kluyveromyces fragilis</i>       | 11.8                     | 18.6       |
| <i>Kluyveromyces marxianus</i>      | 12.2                     | 16.2       |
| <i>Debaryomyces hansenii</i>        | 11.2                     | 20.4       |
| <i>Candida albicans</i>             | 15.8                     | 18.8       |
| <i>Candida glabrata</i>             | 13.8                     | 19.2       |
| <i>Candida utilis</i>               | 11.6                     | 18.2       |
| <i>Cryptococcus neoformans</i>      | 15.4                     | 17.2       |

\*Values, including diameter of the filter paper disc (6.0 mm), are means of 3 replicates.

\*\*Clotrimazole (50 IU/disc).

The results of the present study confirm the presences of antiyeast activity in *Bjekandera adusta* extracts. According to findings from the National Nosocomial Infection Surveillance System (NNIS)<sup>5</sup>, 61 % of reported nosocomial fungal infections were due to *Candida albicans*, followed by other *Candida* spp. and *Cryptococcus* spp. The active compound of extract which is responsible for antiyeast activity remains to be elucidated in further studies. In addition, it might provide a new drug effective against clinically relevant fungal pathogens such as *Candida* and *Cryptococcus* species.

## REFERENCES

1. L. Barros, R.C. Calhelha, J.A. Vaz, I.C.F.R. Ferreira, P. Baptista and L.M. Estevinho, *Eur. Food Res. Tech.*, **225**, 151 (2007).
2. N.H. Khan, M.S.A. Nur-E Kamal and M. Rahman, *Indian J. Res.*, **87**, 395 (1988).
3. NCCLS, Performance Standards for Antimicrobial Disk Susceptibility Tests, Standard, NCCLS M100-S12, Wayne: Pennsylvania (2002).
4. C.H. Collins, P.M. Lyne and J.M. Grange, *Microbiological Methods*, Butterworth Co. Ltd., London, edn. 6, p. 410 (1989).
5. J.J. Walsh, J.A. Sutcliffe and N.H. Georgapapadakov, *Invasive Fungal Infections: Problems and Challenges for Developing New Antifungal Compounds, Merging Targets in Antibacterial and Antifungal Chemotherapy*, New York, Chapman and Hall, pp. 349-373 (1992).

(Received: 5 February 2010;

Accepted: 2 July 2010)

AJC-8856