Short communication

Geotrichum candidum: an emerging opportunistic fungal pathogen

Abstract

Geotrichum candidum is an emerging opportunistic fungal pathogen of significant medical and veterinary importance. The fungus is widely distributed in nature and is commonly isolated from soil, water, air, dairy products, fruits, vegetables, and the digestive tract of humans and animals. Although it may occur as a commensal organism, *G. candidum* can cause severe infections, particularly in immunocompromised individuals suffering from diabetes mellitus, leukemia, AIDS/HIV, neoplasms, or organ transplantation. The pathogen has been associated with a wide range of clinical manifestations including oral, pulmonary, cutaneous, urinary, gastrointestinal, vaginal, ocular, and disseminated infections in humans as well as dermatitis, mastitis, abortion, and enteritis in animals. Laboratory diagnosis mainly relies on direct microscopy, fungal culture, and histopathological examination. Several antifungal agents such as amphotericin B, voriconazole, ketoconazole, and miconazole have been used for treatment. The present communication highlights the epidemiology, clinical significance, diagnosis, and therapeutic approaches of *G. candidum* infections, and emphasizes the need for further studies on its pathogenesis, virulence, and molecular diagnosis.

Keywords: *geotrichum candidum*, geotrichosis, opportunistic fungal infection, diagnosis, antifungal therapy, emerging pathogen, veterinary mycology, public health

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Introduction

Fungi have emerged as a significant cause of morbidity as well as mortality in immunocompetent and immunosuppressed people worldwide.[1,2] *Geotrichum candidum*, the principal cause of geotrichosis, is an emerging opportunistic fungal pathogen, which can cause disease in humans and in animals.[3] Many investigators from different countries of the world reported the role of *G. candidum* in various clinical disorders of humans and animals.[3-9] Although the infections caused by *G. candidum* are worldwide in distribution, a greater number of cases are reported from the USA, Germany, and India.9 The infection is mostly occurring in sporadic form.[10]

Geotrichum candidum is a saprobic ubiquitously prevalent fungus that has been isolated from soil, water, air, fruits, vegetables, milk, dairy products, besides digestive tract of humans and other animals.[2,3,11] The fungus occurs as a commensal, and colonizes the skin, respiratory, and digestive tracts of human beings.[2,11] It is mentioned that inhalation, contact, and ingestion can act as sources of exposure to *G. candidum*.[9,10] People having certain underlying diseases, such as diabetes mellitus, leukosis, AIDS/HIV, neoplasms, and kidney transplant are more predisposed to *G.candidum*.[3,6,12]

The natural infection due to *G. candidum* has been documented in humans, and also in cattle, chicken, dog, goat, horse, gorilla, mouse, ocelot, penguin, pig, red flamingo, snake, and tortoise.[2 ,3,6,10] In animals, *G. candidum* is associated with dermatitis, mastitis, abortion, enteritis, besides oral, pulmonary and renal disorders.[2,3] Pal[5] is credited to establish the role of *G. candidum* in canine oral ulcers for the first time in India.

Researchers from various parts of the world elucidated the etiologic significance of *G. candidum* in cutaneous, oral, bronchial, pulmonary, urinary, vaginal, besides eye, heart, nail, ear, and alimentary infections.[2,6-9,12] Disseminated infections due to *G. candidum* female in a 47-year-old with acute leukemia was reported by Kassamali and others.[13] Hrdy and others14 described traumatic joint infection due to *G. candidum* in a patient. The postoperative fungal endophthalmitis due to *G. candidum* was described in a patient by Myiant and co-investigators.[15] Dave and Pal[6] elucidated the etiologic role of *G.candidum* in oral lesions of a 34-year-old male patient who was diabetic and HIV positive.

Direct microscopy is done with potassium hydroxide (KOH) solution, and Gram stain. The fungus can be easily isolated from the clinical specimens on Sabouraud dextrose agar with chloramphenicol and Pal sunflower seed medium at 300^{0}C. The detailed morphology of the fungal isolates is studied in PHOL (Pal, Hasegawa, Ono, Lee) stain and Narayan stain. Examination of clinical specimens in KOH wet mount revealed numerous branched septate, hyaline hyphae and rectangular arthroconidia of *G. candidum*. Gram-stained smears showed many elongated, rectangular arthroconidia, and septate hyphae. The colonies of *G. candidum* grew well on both media i.e. Sabourauda agar and Pal sunflower seed agar[16] producing flat, dry, and white to cream-coloured colonies. There was no indication of reverse pigment. Subculture of fungus in Narayan stain revealed hyaline septate branched hyphae, and smooth arthroconidia.[6] Histopathological examinations of tissues by Gomori methanamine silver stain and fluorescent antibody test can help in diagnosis.[10] The demonstration of fungal elements in clinical specimens and its isolation in pure and luxuriant growth is still considered as the gold standard for diagnosis of mycosis.[2] Attempts should be made to employ molecular tools in the diagnosis of *G. candidum* infection.

A number of drugs for topical (gentian violet (1%), miconazole, ketoconazole) and systemic use (amphotericin B liposomal, posaconazole and voriconazole) are tried for the treatment of *G. candidum* infections.[9]

As Pal sunflower seed medium, and PHOL, Narayan stain is cheaper than other fungal media and stains, hence, their wider application in the microbiology and public health laboratories for the study of fungi, including *G. candidum* is highly recommended. It is advised that early diagnosis and prompt institution of therapy

with antifungal drugs are imperative to prevent the complications in immunocompromised subjects. The emphasis is given to elucidate the emerging role of *G. candidum* in numerous clinical conditions of humans and animals. The pathogenesis, transmission dynamics, virulence, epidemiology, and molecular diagnosis of *G. candidum* should to be further studied to get a better insight about this emerging mycotic pathogen of medical and veterinary importance.

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Conflicts of interest

The author declares that there are no conflicts of interest.

References

1. Pal M. Morbidity and mortality due to fungal infections. *J Applied Microbiol Biochem*. 2017;1:1–3.
2. Pal M. *Veterinary and Medical Mycology*.1st Ed. Indian Council of Agricultural Research, New Delhi, India. 2007.
3. Pal M, Sejra S, Sejra A, et al. Geotrichosis: An opportunistic mycosis of humans and animals. *Int J Livest Res*. 2013;3(2):38–44.
4. Pal M, Lee CW, Matsusaka N. Occurrence of *Geotrichum candidum* in two cases of canine dermatitis. *J Vet Clin*. 2002;19:433–435.
5. Pal M. Role of *Geotrichum candidum* in canine oral ulcers. *Rev Iberoam Micol*. 2005;22(3):183.
6. Dave P, Pal M. Etiologic role of *Geotrichum candidum* in oral lesions of an immunocompromised patient. *Madridge J Vaccines*. 2017;1(1):24–26.
7. Mantes CMR, Osornio JS, Gamboa AM. Cutaneous infections by *Geotrichum* spp. *Current Fungal Rep.* 2024;18:60–68.
8. M Pal. *Zoonoses*, 2nd Ed. Satyam Publishers, Jaipur, Rajasthan, India. 2007.
9. Bonifaz A, Vazqurz G D, Macias B, et al. Oral geotrichosis: report of 12 cases. *J Oral Sci*. 2010;52:477–478.
10. Bilma FB, Yetik M. *Geotrichum candidum*: a rare infection agent in urinary system: case report and review of the literature. *J Clin Experimental Invest* 2027;8(4):127–129
11. Kassamali H, Anaissie E, Ro J, et al. Disseminated *Geotrichum candidum* infection. *J Clin Microbiol*. 1987;25(29):1782–1783.
12. Hrdy DB, Nassar NN, Rinaldi MG, et al. Traumatic joint infection due to *Geotrichum candidum*. *Clin Infect Dis*. 1995;20(2):468–469.
13. Myint T, Dykhuizen MJ, McDonald CH, et al. Post operative fungal endopthalmitis due to *Geotrichum candidum*. *Med Mycol Case Rep*. 2015;10:4–6.
14. Pal M, Hasegawa A, Ono K, et al. A new staining solution for the morphological studies of fungi and Prototheca. *Jap J Vet Res*.1990;52(3):727–531.
15. Pal M. Efficacy of "Narayan" stain for morphological studies of mould, yeasts and algae. *Rev Iberoam Micol*. 2004;21:219.
16. Pal M. Use of Pal's sunflower medium for an early diagnosis of *cryptococcosis*. *The Antiseptic*. 1997;95(5):175.