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Editorial

# Kocuria kristinae: An Emerging Opportunistic Pathogen of Public Health Significance

**Mahendra Pal***

*Narayan Consultancy of Veterinary Public Health and Microbiology, Bharuch, Gujarat, India*

***Corresponding Author:** Mahendra Pal, Narayan Consultancy of Veterinary Public and Microbiology, B-103, Sapphire Lifestyle Consultancy, Maktampur Road, Bharuch, Gujarat, India.

**Received:** October 26, 2026; **Published:** October 30, 2026

Commensalism refers to a microorganism that lives inside the host (human or animal) without harming each other [1]. Opportunistic pathogen denotes to an organism, which usually do not cause disease in the healthy subjects but can lead to severe infections in those with a weakened immune system [2]. There are a number of microbes, such as viruses (Cytomegalovirus, Herpes simplex virus), bacteria (*Clostridioides difficile*, *Staphylococcus aureus*), fungi (*Candida albicans, Cryptococcus neoformans*), and parasites (*Cryptosporidium parvum*, *Toxoplasma gondii*), which can act as an opportunistic pathogen [1,3-5]. Opportunistic pathogens are an important cause of morbidity and mortality especially in the immunocompromised subjects. Some of the opportunistic agents like *Cryptococcus neoformans* causes life-threatening infections in humans as well as in animals [5]. The patients exhibit a wide variety of clinical symptoms, and hence; laboratory help is required to make an unequivocal diagnosis of the infections caused by opportunistic agents. An early and correct diagnosis, and timely therapy are crucial in proper managing the opportunistic infections particularly in the immunosuppressed patients [1,5].

*Kocuria kristinae* is an emerging opportunistic pathogen of medical importance [6] that was first time described in 1974 [7]. It belongs to the genus *Kocuria* and the family *Micrococcaceae*. The genus received its name from Miroslav Kocur, a Slovakian Microbiologist [8]. The bacterium can be easily isolated on sheep blood agar. It is a Gram positive, non-motile, non-capsulated, non-spore forming, oxidase positive, coagulase negative, catalase positive, and facultative anaerobic bacterium [8,9]. The organism showed highest sensitivity to vancomycin, rifampicin, ampicillin, meropenem, teicoplanin, cefotaxim, minocycline, and tigecycline whereas erythromycin, gentamycin, and penicillin exhibited maximum resistance [10].

The infection due to *K. kristinae* has been described from several nations including Egypt, India, Tiawan, China, Iraq, Iran, and USA [8,11,12,14,15].

It is mentioned that *Kocuria* species are commensal bacteria that primarily colonize the skin, mucous membranes, and oropharynx in humans [6]. However, the association of *Kocuria kristinae* with various clinical disorders, such as pneumonia, bacteraemia, acute cholecystitis, peritonitis, infective endocarditis, endophthalmitis, meningoencephalitis, short bowel syndrome in humans has been established by several investigators [7,11,15-17].

Ma and co-investigators [11] reported the first case of *K. kristinae* infection associated with acute cholecystitis in a 56-year-old man from China and the organism was isolated from the bile of the patient. A study conducted in Tiawan by Chen and others [13] described that *K. kristinae* should be considered as true pathogen in paediatric patients and hence, it requires immediate treatment to mitigate the sufferings of the patients. Community-acquired pneumonia and systemic bacteraemia caused by *K. kristinae* was reported in the USA by Beonshteyan and co-workers [15]. Namba and others [17] investigated the association of *K. kristinae* with short bowel syndrome in a 70-year-old woman who had undergone total hysterectomy and radiation therapy for cervical cancer 36 years ago.

In most cases, the bacterium was recovered from blood, however, isolations were also made from other clinical specimens, such as sputum, throat swab, synovial fluid, pus, bile, peritoneal fluid, urine, cerebrospinal fluid and fluid from abdominal abscess [7,10]. The bacterial colonies on blood agar were yellow in colour and non-haemolytic [8]. The biochemical phenotyping was considered the most commonly used method for the identification of *K. kristinae* as it detected the bacteria in about 75% of cases [10]. The bacterium should be differentiated from *Staphylococcus* species [9].

Antibiotics are used to treat the patients suffering from *K. kristinae* infection. In this context, Ziogou and others [9] reported that vancomycin (47%), cephalosporins (39.6%), and quinolones (36.6%) were the most commonly used antimicrobials for treating the infections caused by *K. kristinae.* Due to multiple drug resistance, treatment is challenging to the physicians. It is suggested to investigate the efficacy of various plants extract against *K. kristinae* to mitigate the problem of drug resistance.

Marques and co-investigators [18] are credited to elucidate the etiologic role of *K. kristinae* in the skin lesion of a four-year-old female Cuban boa (*Epicrates angulifer*) that was kept in a zoological park in Portugal. The strain of *K. kristinae* isolated from the skin lesion of Cuban boa was multidrug resistant as it showed resistant to several antibiotics, such as erythromycin, tetracycline, kanamycin, clindamycin, pradofloxacin, trimethoprim/sulphamethoxazole, and nitrofurantoin.

It is suggested that further work on the ecology, virulence, pathogenesis, transmission dynamics, risk factors, epidemiological pattern, and resistance mechanism of chemotherapeutic agents will be rewarding. Emphasis is given on early diagnosis and treatment after drug sensitivity test. There is a need to undertake comprehensive and systematic studies to understand the role of *K. kristinae* in various clinical disorders of many animal species. Dedicated attempts are required to established the zoonotic potential of *K. kristinae.*

## Acknowledgements

The author is indebted to Prof. Dr. R. K. Narayan for his critical comments during the preparation of this manuscript. This paper is dedicated to all the scientists who made significant contribution in the study of *Kocuria kristinae*.

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**Volume 22 Issue 11 November 2026**
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