

Case Report

Isolation Reddish Pigment Producer *Metschnikowia* Species as Skin Residents: A Case Report and Short Review of the Literature

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Abstract

In our investigation on skin fungal flora associated with 9 different skin sites of 238 healthy people, including 119 males and 119 females, 3 *Metschnikowia* species were isolated. 2 of them were detected from the fingernail and the exile of an 87-year-old man and 1 of them was detected from the groin of a 76-years-old man. Collected samples were examined by culture on Sabouraud Chloramphenicol Agar and then 3 yeast-like organisms with reddish pigment, were detected. For precise identification, the D1/D2 domain of the large subunit (26S) ribosomal DNA region was sequenced. To our knowledge, this is the first report of isolation reddish pigment producer *Metschnikowia* spp. as human cutaneous residents in Iran. According to the fact that the intensity of pigmentation is correlated with the antimicrobial activity, this rare yeast is a human colonizer that specially can turn into a human pathogen in immunocompromised patients.

Keywords: Metschnikowia spp.; Skin residents; Molecular identification

Introduction

The genus *Metschnikowia* belongs to the family Metschnikowiaceae [1]. This family includes terrestrial and water ascomycetous yeasts that have been isolated from excrements of the fruit larvae; honey blossom nectar and from the digestive tract of bees; also cider, wood and rarely from human material [2].

Metschnikowia isolates synthesize pigment to inhibit the growth of sensitive microorganisms by sequestration of iron. The antimicrobial characteristic of *Metschnikowia* relies on the dependent production of a reddish pigment, pulcherrimin that forms a chelate complex with ferric ions [3-5]. The pigment production also enables pigmented species to survive in the hostile environment, especially in the human host [5].

Evidence have emerged that *Metschnikowia* species may act as a colonizer on the skin, blood, rectum, vagina, nasopharynx and sputum [2]. In addition, the fungus is likely to cause onychomycosis, intravenous port system infection, acne neonatorum, stasis dermatitis, diaper dermatitis, and tinea pedis [1,2, 6, 7-9). To date, no study has reported the isolation of pigment producing *Metschnikowia* species from human in Iran and this is the first report of isolation reddish pigment producer *Metschnikowia* spp. as human cutaneous residents in this tropical country.

Case report

A total of 238 healthy people, in four age groups (infants, children, adults and elderly), were studied. These subjects included 119 males and 119 females, with equal gender distribution in all age groups.

The subjects have not washed their hands, feet, or other areas just before sampling and the sampling was made after the activities of the day. The following areas were sampled by means of a cotton-tipped swab moisten with sterile serum physiology: the forehead, dorsum of hands, dorsum of feet, finger nails, toenails, the axilla, the groin, the interdigital spaces of hand and foot and the sub-mammary space in women. All skin swab specimens were first cultured on SDA supplemented with chloramphenicol for fungi primary isolation.

Using microscopic and macroscopic examination methods, among the studied population, 25 persons were positive for *Rhodotorula* isolation. Also, from 1994 anatomical sites that were sampled in total, 28 anatomical sites were positive for *Rhodotorula* genus. In fact, by using conventional methods, positive plates for the growth of typical reddish colonies on SC medium, were reported as *Rhodotorula* genus. In this study for precise identification of species DNA sequencing was performed for all isolates. DNA sequencing determined that 3 colonies that were reported as *Rhodotorula* genus according to colony color, were belonged to *Metschnikowia* genus. 2 colonies were associated with the finger nail and the axilla of an 87-year-old man and 1 colony was associated with the groin of a 76-years-old man.

Discussion

The skin is the body's largest organ that hosts heterogeneous inhabitants. This organ is significantly colonized by a variety of bacterial and fungal population [10] and among the fungal population inhabiting the surface of the skin *Metschnikowia* species are detected as a rare skin colonizer [9].

Although *Metschnikowia* infection is known for a long time, limited data on its epidemiology are available from the world and until now, there is no report of its isolation from human in Iran. The main reasons are misdiagnosis and misidentification.

Only few case reports and small series are available in this field.

Kuan CS et al. presented the first report of the isolation of *Metschnikowia* non-pulcherrima spp. from skin scraping and described this rare yeast species as a potential human pathogen that may be misidentified as *Candida* spp. using conventional method [9]. Mohl W et al. reported an intravenous port system infection caused by *Metschnikowia pulcherrima* [1].

Also a large pulmonary mycetoma was reported in a male patients with ankylosing spondylitis, upper lobe fibrosis and cavitation. In this study *Metschnikowia pulcherrima* was isolated as etiologic agent [6]. Pospisil L examined 4644 specimens including skin scales, nails, hair, beard, sputum—obtained from patients suffering from skin problems in which *C. pulcherrima* was found in 44 cases. The most frequent diagnosis was onychomycosis (36 %) and tinea pedum (32 %) [2].

Anyway, this rare yeast is a potential human pathogen which can cause different clinical presentations in immunocompromised patients [1, 2, 6, 7-9]. So it is very important to consider its differential diagnosis from members of *Rhodotorula* genus because it can be misidentified as *Rhodotorula* using conventional methods and the reason for this misidentification is the creation of a reddish colony in both pathogen *Metschnikowia* species and the members of *Rhodotorula* genus.

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Conflict of Interest

The authors have no conflicts of interest to declare for this study.

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