

# Malassezia: Unraveling the Intricacies of a Skin-Residing Fungus

Laila Hussein\*

Department of Dermatology, NDMC Medical College & Hindu Rao Hospital, New Delhi, India

\*Corresponding author: Laila Hussein, Department of Dermatology, NDMC Medical College & Hindu Rao Hospital, New Delhi, India, E-mail: lailahuss@gmail.com

**Received date:** February 27, 2023, Manuscript No. IPMMO-23-16656; **Editor assigned date:** March 01, 2023, PreQC No. IPMMO-23-16656 (PQ); **Reviewed date:** March 13, 2023, QC No. IPMMO-23-16656; **Revised date:** March 23, 2023, Manuscript No. IPMMO-23-16656 (R); **Published date:** March 30, 2023, DOI: 10.36648/2471-8521.9.1.55

**Citation:** Hussein L (2023) Malassezia: Unraveling the Intricacies of a Skin-Residing Fungus. Med Mycol Open Access Vol.9 No.1:55.

## Description

Malassezia is a genus of yeast-like fungi that naturally inhabit the skin of humans and animals. While these fungi are part of the normal skin microbiota, they can also be opportunistic pathogens, leading to various skin conditions and infections. In this article, we delve into the fascinating world of Malassezia, exploring its characteristics, role in skin health, and its association with skin disorders.

Pityriasis versicolor is a chronic superficial fungal infection caused by Malassezia spp. It occurs worldwide but it is more frequent in tropical areas. It predominantly affects adolescents and young adults since sebum production is at its highest level at that age. It classically manifests as round to oval macules that can be hypopigmented, hyperpigmented or erythematous (hence the name versicolor) and typically affects the upper trunk as well as the upper arms, neck and face. The Malassezia genus includes a group of lipophilic yeasts whose natural habitat is the humans and warm-blooded animals' skins. As a consequence of various exogenous or endogenous factors including hyperhidrosis, genetic factors and use of corticosteroids, these yeasts become pathogenic. In spite of treatment, the recurrence rate of PV is about 60% in the first year and 80% in the second year.

Recently, Malassezia genus has gained medical importance as emerging pathogens associated with blood stream infections in immuno-compromised patients and neonates receiving parenteral lipid emulsions. Consequently, early laboratory diagnosis is required to prevent morbidity, recurrences and invasive infections.

To date and on the basis of morphology, ultra-structure, physiology and molecular biology studies, 18 species were identified within Malassezia genus: *M. psittaci* and *M. vespertilionis* were either isolated from animal or from human mycosis other than PV. So far, there is still ongoing debate on Malassezia species associated with the development of this disease, with varying results from different countries and different regions within the same country. In Tunisia, available data concerning the patterns of Malassezia infections are scattered. Indeed, a thorough literature review on this subject revealed only five studies, concerning Malassezia genus, dated

of 2005, 2008, 2010 and 2017. Out of these investigations, only two studies have identified Malassezia species from 99 positive culture from PV patients using a phenotypic approach. Two others have focused on various dermatomycosis caused by Malassezia including PV and applied molecular approaches (PCR-sequencing and real time PCR) for identification of 45 PV positive culture. The remaining study has aimed to identify Malassezia species from patients with folliculitis. However, no study was conducted concerning the clinico-demographic features of PV in the Tunisian population and no updates have been published regarding the identification of Malassezia species from PV patients since more than 11 years.

While PV is a benign mycosis, its chronicity, recurrence and unsightly appearance are significantly impairing the patient's quality of life. Thus, epidemiological investigations remain of great interest and could help both physicians and epidemiologists to understand the conditions that induce transformation of Malassezia yeast from the saprophytic to the pathogenic form.

Thereby, the aims of this study were to: i) define the clinical and epidemiological characteristics of PV from Tunisian patients (referring to the region of Monastir), ii) identify isolated Malassezia species using both phenotypic and molecular approaches and iii) assess any potential association between Malassezia species and patients' clinico-demographic profile.

## Understanding Malassezia

**Taxonomy and Species Diversity:** The genus Malassezia comprises a diverse group of lipophilic (fat-loving) fungi. Currently, over 20 species have been identified, with Malassezia globosa and Malassezia restricta being the most prevalent species found on human skin. These fungi are typically present in areas rich in sebaceous glands, such as the scalp, face, and upper trunk. **Morphology and Adaptations:** Malassezia species are characterized by their unique cellular morphology, which includes round or oval-shaped cells with a thick cell wall. They reproduce by a process known as budding, where a new cell forms as an outgrowth from the parent cell. Additionally, these fungi have evolved adaptations that enable them to thrive in lipid-rich environments, such as the production of enzymes that break down skin lipids for their nutrition.

## Role in Skin Health

**A. Commensalism and Mutualism:** Despite their potential pathogenicity, *Malassezia* species generally exist as commensal organisms on the human skin, maintaining a symbiotic relationship with the host. They derive nutrients from the host's sebum and help in the regulation of skin pH. Additionally, recent research suggests that *Malassezia* may contribute to the development of a healthy skin barrier and modulate immune responses. **Lipid Metabolism:** *Malassezia* species are known for their ability to metabolize various lipids present on the skin. They possess enzymes that break down triglycerides, fatty acids, and cholesterol esters, releasing byproducts that can influence the local environment. The interplay between these lipid-modifying activities and the host's immune system can influence skin health and the development of certain skin disorders.

**Malassezia-Associated Skin Disorders:** **A. Malassezia-Related Dandruff and Seborrheic Dermatitis:** *Malassezia* species are strongly implicated in the development of dandruff and seborrheic dermatitis, which are common scalp conditions. In

individuals susceptible to these disorders, the colonization and metabolic activities of *Malassezia* can lead to an abnormal inflammatory response, resulting in scalp itching, flaking, and redness. **Malassezia Folliculitis:** *Malassezia* folliculitis, also known as pityrosporum folliculitis, is a superficial fungal infection that affects the hair follicles. It occurs when *Malassezia* organisms invade the hair follicles, leading to inflammation and the formation of small, itchy pustules. This condition is commonly observed on the upper trunk, shoulders, and back. **Other Malassezia-Associated Skin Conditions:** *Malassezia* has also been implicated in the development of other skin disorders, including atopic dermatitis, psoriasis, and acne vulgaris. While the exact mechanisms linking *Malassezia* and these conditions are still being investigated, it is believed that the presence of these fungi can trigger or exacerbate the inflammatory response in susceptible individuals. **Treatment and Management:** **A. Antifungal Therapy:** The treatment of *Malassezia*-related skin disorders often involves the use of topical antifungal agents. These medications, such as ketoconazole, selenium sulfide, or ciclopirox, help reduce