



## Mycologic Forum

# *Malassezia pachydermatis*: To be, or not to be lipid-dependent<sup>☆</sup>

## *Malassezia pachydermatis*: ser o no ser lipodependiente

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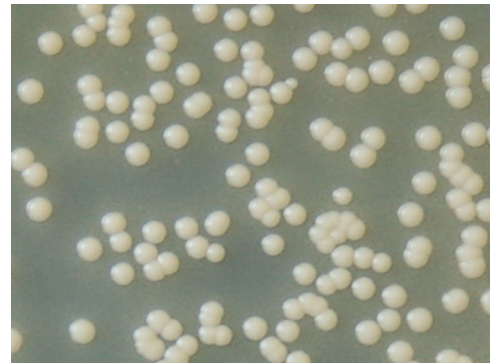
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*Malassezia* yeasts are part of the normal microbiota of the skin of various animals, where they find the lipids necessary for their development. Most species are lipid-dependent, a term that has traditionally been used to describe that these yeasts cannot grow in Sabouraud glucose-agar (SGA) medium without adding certain long-chain fatty acids. For this reason, today, these yeasts are grown in media enriched with lipid components, such as modified Dixon agar, which contains oleic acid and Tween 40, or Leeming and Notman agar, which contains milk and Tween 60, among others. These ingredients provide most species with the proper supplements for an optimal growth.

Conversely, *Malassezia pachydermatis*, a frequent reason for dermatological consultation in dogs and cats, is classically considered a non-lipid-dependent species. This is because the vast majority of the strains of this species can grow in SGA without the addition of lipids (Fig. 1). Although infrequent, some strains of this species grow poorly in SGA. However, the isolation of *M. pachydermatis* strains unable to grow on SGA has been rarely reported. On the other hand, these same strains usually grow well after repeated subcultures in the same medium. Nevertheless, in a recent study where more than 400 lipid-dependent strains of this genus from different animal species were analysed, three strains of *M. pachydermatis* unable to grow in SGA were identified.<sup>1</sup> So, a few strains of this species are lipid-dependent.

In fact, a study of the genomes of these yeasts has shown that all the species of this genus lack genes coding for a fatty acid synthase.<sup>2</sup> This means that they need the supply of lipids in order to grow and, therefore, all the species in this genus are lipid-dependent, a fact that makes them unique among fungi. It is not surprising that this



**Fig. 1.** Colonies of *Malassezia pachydermatis*. Most strains of this species can grow in the medium of Sabouraud glucose agar without the addition of lipids, so they are traditionally referred to as non-lipid-dependent. However, all strains of this species are actually lipid-dependent, as they need lipids to grow.

specific loss of genes is a consequence of their adaptation to living in the skin, which provides these species with all the lipids necessary for their growth. In this process, as these authors point out, these yeasts have increased their genetic arsenal with a multitude of lipid hydrolases that are necessary to utilise the lipids present in this environment. On the contrary, their genomes have lost genes involved in the metabolism of carbohydrates, which are not very abundant in the skin.

On the other hand, if we analyse the composition of the SGA we see that it is an undefined medium that includes peptone. Peptone contains a minimum amount of lipids, which allow the adequate growth of most strains of *M. pachydermatis*. This fact indicates that these strains, although few, need lipids. Therefore, all the strains of this species are, actually, lipid-dependent.

<sup>☆</sup> These Mycology Forum articles can be consulted in Spanish on the Animal Mycology section on the website of the Spanish Mycology Association <https://aemicol.com/micologia-animal/>  
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**Conflict of interest**

Author has no conflict of interest.

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