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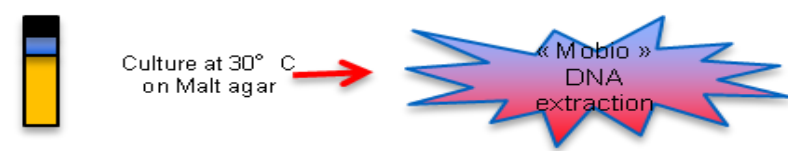
Objectives

Infections due to the zoophilic dermatophyte *Arthroderma benhamiae* are being more frequently diagnosed in Belgium since a few years. The most common source of infection is guinea pigs. This species which is referred to the *Trichophyton* species of *A. benhamiae* can cause tinea capitis, tinea corporis, tinea manus and more frequently tinea faciei. These strains appear with a bright yellow thallus in culture and do not easily sporulate making them difficult to identify. Sequencing of these strains reveals "*Arthroderma benhamiae*". At the contrary white strains of *T. mentagrophytes* complex are identified by sequencing as "*T. mentagrophytes* variety *interdigitale*" or *T. interdigitale*. The aim of the study is the evaluation of the genetic heterogeneity of these two subtypes of the *T. mentagrophytes* complex by using the Diversilab® system.

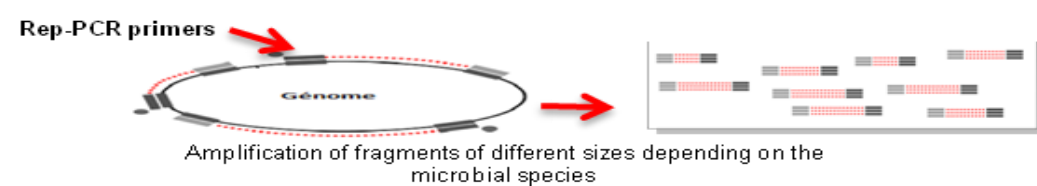
Methods

32 strains were collected by the National Reference Center for mycoses between 2012 and 2015. The fungal strains were identified by microscopy or ITS sequencing. The genotypic analysis was performed by the Diversilab® system (bioMérieux) by DNA fingerprinting generation (Fig.1).

Step 1: Fungal culture + DNA extraction



Step 2: Rep-PCR



Step 3: Diversilab® analysis

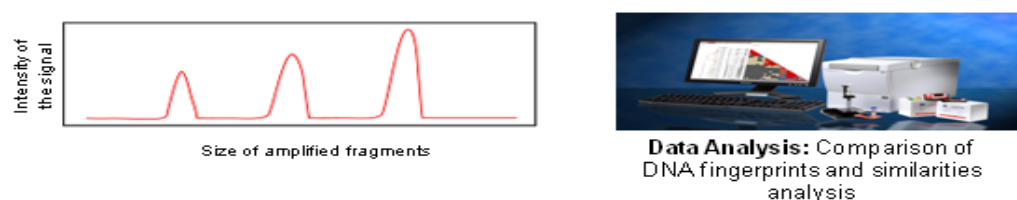


Figure 1: Description of the Diversilab® method.

Results

Both groups showed huge differences in DNA fingerprints. The similarity calculated by the Diversilab® tool between the two groups was 70% (see Fig. 2, Fig.4 and Fig.5). This reflects a high genotypic heterogeneity regarding the two types of strains analyzed. This is surprising given that both groups belong to the same species complex. 14 strains belonging to *T. interdigitale* and 18 strains belonging to *A. benhamiae* have been characterized.

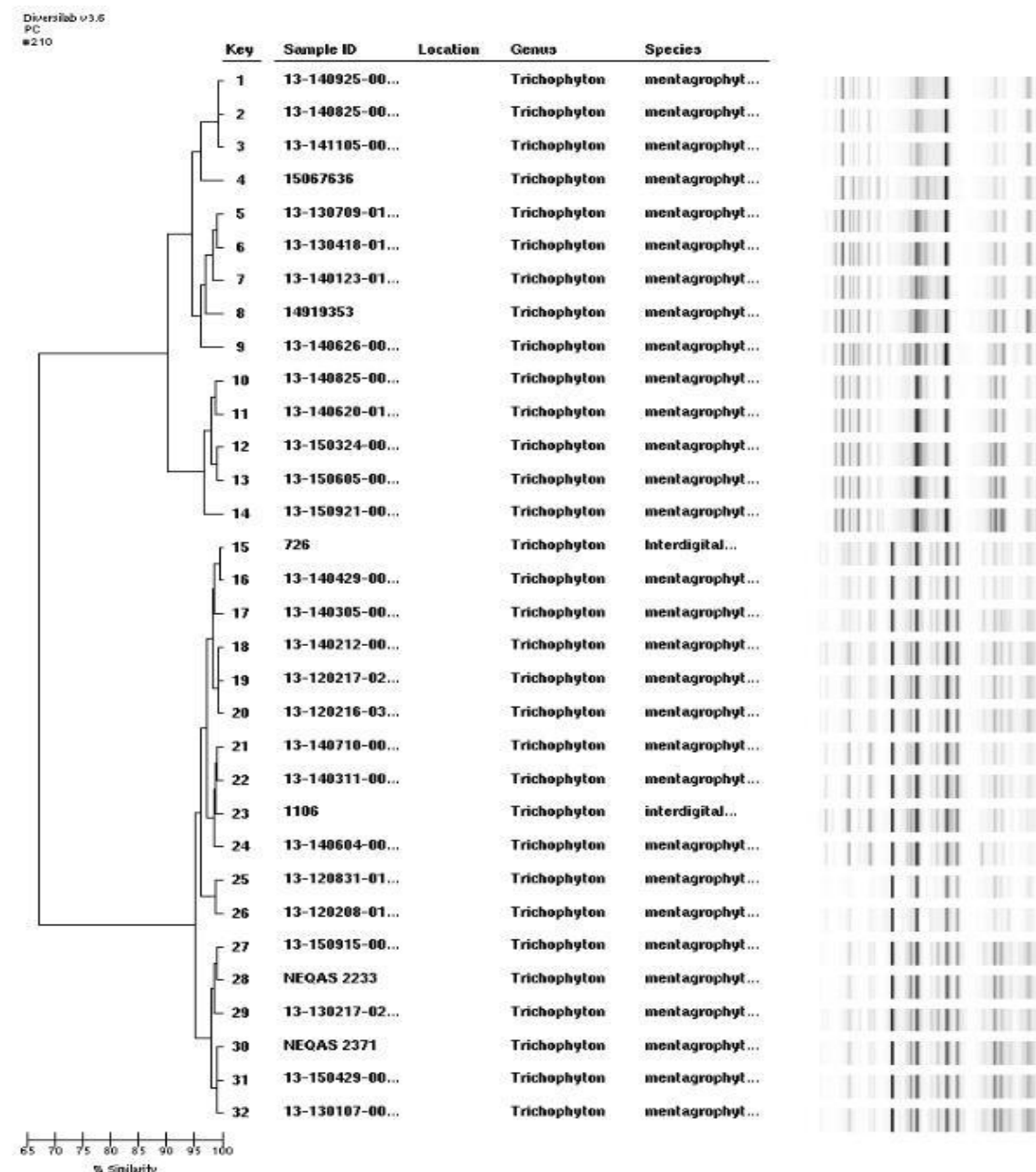


Figure 2: Dendrogram obtained after Diversilab® analysis of the strains

Yellow strains were highly similar to profile 1 and white strains were highly similar to profile 2. Unfortunately, no additional information regarding the subspecies implicated could be obtained from the manufacturer. However, this study demonstrates that it may represent respectively "yellow strains types *Trichophyton* species of *A. benhamiae*" and "white strains types *T. interdigitale*".

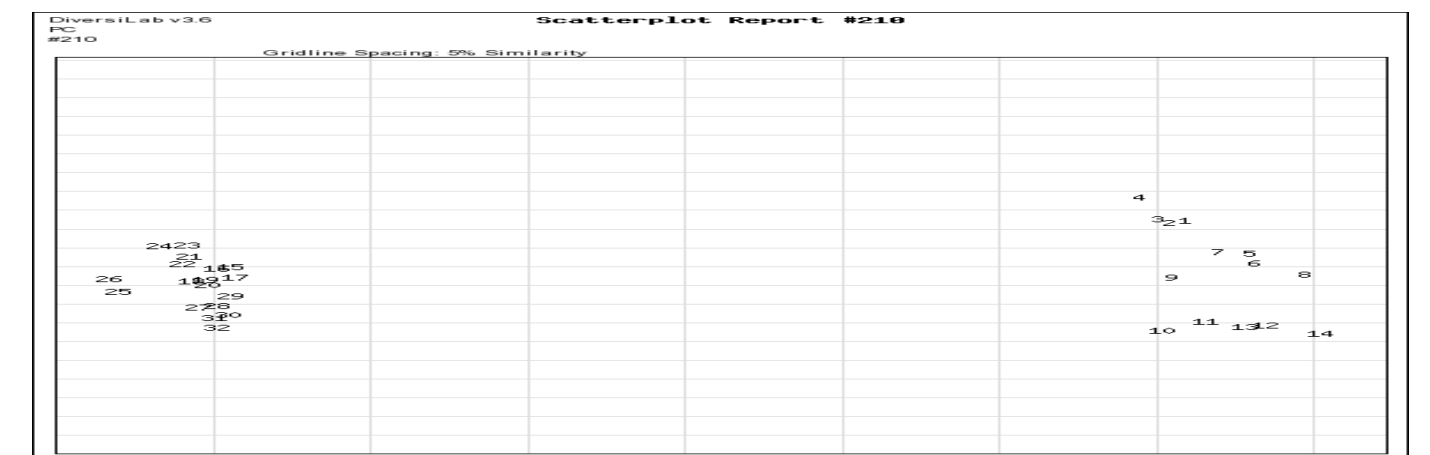


Figure 3: Scatter plots obtained after genomic analysis of strains by Diversilab® showing 2 different groups amongst *T. mentagrophytes* strains.

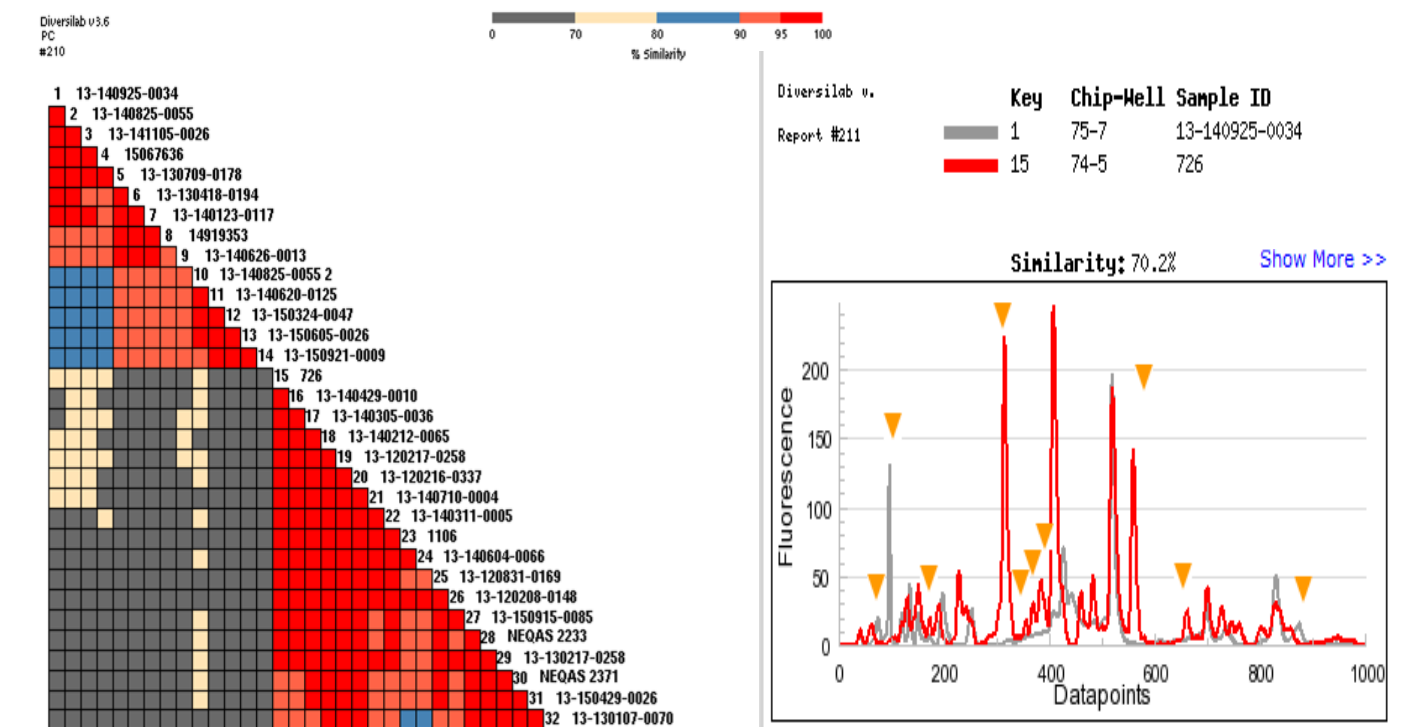


Figure 4: Similarity matrix showing the percentage of similarity between the 32 analysed strains. Of *T. mentagrophytes* complex.

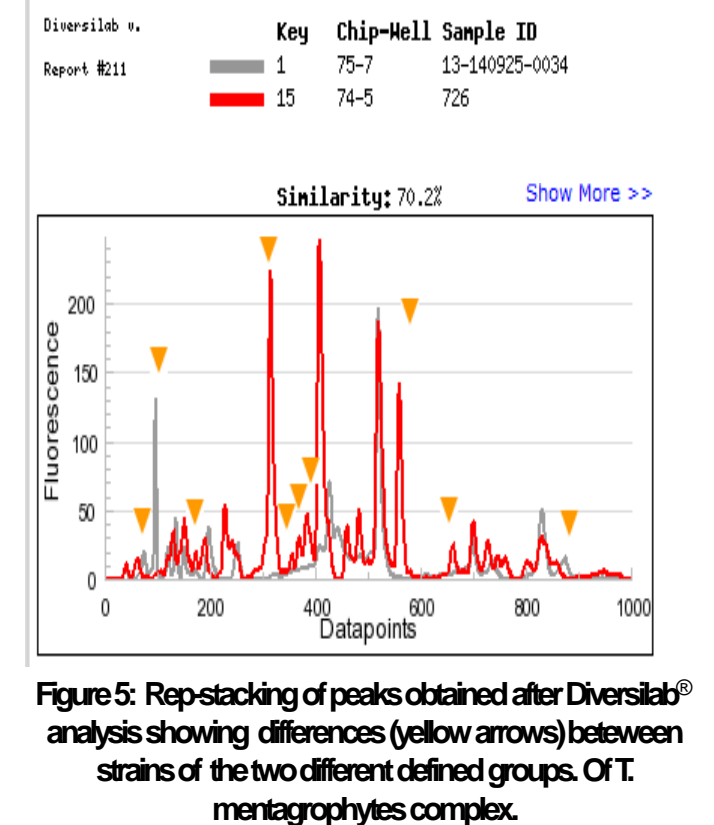


Figure 5: Rep-stacking of peaks obtained after Diversilab® analysis showing differences (yellow arrows) between strains of the two different defined groups. Of *T. mentagrophytes* complex.

Conclusions

The comparison of these two distinct DNA fingerprints with the mold database of bioMérieux generated identification as "*T. mentagrophytes*" for both groups. We noticed that the library contained two distinct patterns of DNA fingerprints (profile 1, strains MK55-60 and profile 2, strains MK138-143).

This study highlights the genotypic differences between two types of strains belonging to the *T. mentagrophytes* species complex. Yellow strains which incidence is increasing in Belgium are clearly different from other strains previously characterized and the Diversilab® method shows a high efficiency for discriminating between these two species difficult to separate by microscopy.