Lineages within the *Trichophyton rubrum* complex

Packeu A.¹, Stubbe D.^{1,2}, Roesems S.^{1,2}, Goens K.¹, de Hoog S.^{3,4} and Hendrickx M.^{1,2}

¹Sciensano, Service of Mycology and Aerobiology, Brussels, Belgium;

²BCCM/IHEM Fungal Collection, Scientific Institute of Public Health, Mycology and Aerobiology Section, Brussels, Belgium;

³Westerdijk Fungal Biodiversity Institute, Utrecht, The Netherlands

The most important species of the *Trichophyton rubrum* group are *T. rubrum*, mainly causing skin and nail infections, and *T. violaceum* which is mostly scalp-associated. The status of a third species, *T. soudanense* has been under debate. With a polyphasic approach, using molecular phylogeny, Maldi-Tof mass spectrometry, physiological and morphological analysis, we re-evaluated the *T. rubrum* complex. Our results support four main lineages within the complex. Next to *T. rubrum* and *T. violaceum*, *T. soudanense* is confirmed as a separate group. The data also show *T. yaoundei* as a phylogenetically and phenotypically distinct lineage closely related to *T. violaceum*.

A total of 81 dermatophyte strains (45 *T. soudanense*; 29 *T. violaceum*; and 7 *T. yaoundei*) from the BCCM/IHEM collection were analyzed

Multilocus sequencing and phylogenetic analyses

T. violaceum

- Isolation site: scalp and hair specimens (tinea capitis)
- Distribution: Asian and African countries
- Morphology
 - Macroscopic: slow growing colonies, with a wrinkled purple/white surface and purple reverse
 - Microscopic: characteristic halo of cleared milk solids and chains of asymmetrical chlamydospores on BCP incubated at 37°C

T. soudanense

- Isolation site: scalp and hair specimens (tinea capitis)
- Distribution: West African countries (Mali & Senegal)
- Morphology:
 - Macroscopic: slightly wrinkled, yellow to orange; yellow-orange or orange-brown reverse; irregular margins with star-like rays
 - Microscopic: reflexive branching, clavate to piriform microconidia

Maldi-TOF MS analysis

Maximum likelihood phylogenetic tree (RAxML v. 7.0.3) based on ITS/BT

The data provided in this polyphasic study demonstrate the distinction of four separate taxa (*T. rubrum*, *T. soudanense*, *T. violaceum* and *T. yaoundei*), with *T. soudanense* and *T. violaceum* as valid species