Nannizzia incurvata as rare cause of favus and tinea corporis in Cambodia and Vietnam

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Objectives: *Nannizzia* (*N.*) *incurvata* (formerly *Microsporum incurvatum*) represents a geophilic dermatophyte which has been previously classified into the species complex of *N. gypseae* (formerly *Microsporum gypseum*). According to the new taxonomy of dermatophytes, *N. incurvata* should be considered as an own species. Two patients with an infection caused by *N. incurvata* are presented in this study. Both strains were identified macroscopically by culture and by Sanger sequencing of the ITS region of the rDNA and the *TEF1-α* gene.

Patient 1 (lab. No. 213959/2017)

- 42 years old, Vietnamese, female, living in Saxony in Germany
- returned from a 2-week visit to her homeland Vietnam
- suffered from a **burning tinea corporis** of the right buttock (Figure 1)
- family members were not affected
- ***N. incurvata*** (Figure 2) was cultured from skin scrapings of the centrifugal lesions
- **treatment**
- clotrimazole + betamethasone dipropionate ointment or ciclopirox olamine cream - no improvement
- mometason furoate - exacerbation
- monotherapy twice daily with ciclopirox olamine cream for 4 weeks
- healing up

Mycological diagnostics

The strains were cultured on Sabouraud's dextrose agar and identified as *N. incurvata* by their macro-morphological (Figure 2, 5) and microscopic (Figure 3, 6) features.

Molecular biological diagnostics

Sequencing was used to confirm both strains to be *N. incurvata*.

- ➔ ITS region (partial 18S rRNA, ITS1, 5.8S rRNA, ITS2, and partial 28S rRNA) and *TEF1-α* (Translation Elongation Factor 1-α)
- ITS region strain 213959/2017 – MF 415405.1 and strain 211859/2017 - MF415404.1 from NCBI
- *TEF1-α* strain 213959/2017 – no cluster to compare and strain 211859/2017 – KM678105.1 from NCBI
- ➔ **Note: Due to the new taxonomy and nomenclature change KM678105.1 was assigned as *N. gypseae*.**
- ➔ strain 213959/2017, Patient 1, DSM106637 and strain 211859/2017, Patient 2, DSM106636 are deposited at DSMZ in Braunschweig, Germany
- ➔ ITS region and *TEF1-α* sequences of both isolated strains will be deposited at the NCBI, the ISHAM ITS Database, and at the Fungal MLST Database

Patient 2 (lab. No. 211859/2017)

- 6 years old, Cambodian, male, living in a village near the river Mekong (water and forest region)
- contact to chicken, dogs, and cattle
- suffered from **tinea faciei** and **tinea capitis** (Figure 4), symptoms for 2 years
- family members were not affected
- initial lesion on the scalp, later extended to the face, **favus**- like tinea capitis and tinea faciei with erythema, scaly patches with areas of alopecia, but no pustules
- main complaints were pruritus and alopecia
- ***N. incurvata*** (Figure 5) was cultured from skin scrapings
- **treatment**
- griseofulvin 250 mg once daily for 12 weeks directed by a paediatrician - no improvement
- Hepatitis B and C and HIV test – negative
- oral terbinafine 125 mg daily, topical miconazole, ketoconazole shampoo, oral cetirizine, and multivitamine preparations for 2 weeks at the Department of Dermatology in Phnom Penh, Cambodia
- healing up after one month

Note: Strains with letters...NCBI; Strains with numbers...routine samples from the lab

Generated by Mega 6.06, Statistical Method Maximum Likelihood, Bootstrap Replication 1000, rooted with *Microsporum ferrugineum*

Conclusion: *N. incurvata* is a rare geophilic dermatophyte first described in Sri Lanka and Vietnam. This study shows the first isolation of *N. incurvata* in Cambodia, and the first description of a favus in a child caused by this dermatophyte.

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