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Studies on the prevalence of dermatophyte *Trichophyton mentagrophytes* in camels

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Abstract
Camel's population in and around Jaipur city are reared by farming community for various purposes which includes transport, hobbying and as pet animals. Few camels attended the clinical complex of Apollo College of Veterinary Medicine, Jaipur with scattered skin lesions in around the neck and cervical regions. These animals were treated symptomatically for generalized skin lesions without success. In this circumstance the camels were tested for its etiological agents by culture, staining technique and urease confirmation tests. This study revealed the presence of *T. mentagrophytes* in the tested camels in around Jaipur city of Rajasthan state.

Keywords: Camel population-prevalence- *T. mentagrophytes*-Jaipur

Introduction
Dermatophytosis is a common contagious disease caused by fungi known as dermatophytes. Dermatophytes are able to break the keratin in tissues. Most of the fungi reside in the soil and in living tissues. Some anthropophilic species are adapted to human and are usually transmissible from person to person. Zoophilic species are adapted to animals. Geophilic species live in the environment but occasionally act as parasites. The zoophilic and geophilic species are transmitted from animals to people. It is possible for human to transmit dermatophytes to animals. In living tissues dermatophytes remain in superficial tissues such as epidermis, hair and nails. The illness causes disfiguring and uncomfortable, especially when the lesions are widespread. Economic effects, such as damage to the hides are important in livestock. In immune compromised animals the dermatophytes invade subcutaneous tissues and other sites. The pathogenic dermatophytes causing keratin digestion are trichophyton, microsporum and epidermophyton species. Most of the dermatophytes becomes adapted to people or animals and are maintained in these reservoirs. Although they can infect other hosts, it is not maintained in other species long term. Zoophilic dermatophytes are adapted to various animal species, while anthropophilic dermatophytes occur in humans. Most or all zoophilic dermatophytes are thought to be zoonotic, although some are transferred to people more often than others. There are numerous species of anthropophilic dermatophytes in the 3 genera i.e trycophyton, microsporum and epidermophyton.
Although anthropophilic dermatophytes can be transmitted to animals, this seems to be rare. The predominant species of dermatophytes involved in human cases vary with climate and location and other factors such as exposure to livestock, pets or exotic species. Zoophilic dermatophytes can be a common cause of a syndrome in one region, while anthropophlic dermatophytes account for most cases in another. Anthropophylic dermatophytes are reported infrequently in animals. Some dermatophytes species documented in camels are *T. rubrum, T. tonsurans, T. violaceum, T. schoenleinii, M. audonini and E. floccosum*. The available studies in India indicate the presence of *M. audouinii, M. canis,. M. nanum, M. ferrugineum, M. gypseum, T. verrucosum, T. mentagrophytes, T. schoenleinii, T. equinum, T. concentricum, T. tonsurans, T. violaceum,, T. soudanense, T. rubrum, E. floccosum* the following species of dermatophytes in camel. (Tuteja *et al.* 2013/2) [5]. Kuttin *et al.* (1986) [1] reported 0.5% of the camels suffered with *T. mentagrophytes.*

Case history

It was observed that the camels attending the Veterinary Clinical Complex in Apollo College of Veterinary Medicine, Jaipur observed with the clinical signs of generalized skin involvement. The initial lesions were discrete, scaly and alopecic with grayish white crusts. The lesions observed mostly on the neck, chest, face, dewlap, lower abdomen and inter-maxillary skin. These animals being treated symptomatically for generalized skin disorders without success. Materials collected from the affected skin areas revealed fungal infection in these animals. In these circumstances this study was carried out to rule out the involvement of dermatophyte species in the affected camel population in and around Jaipur city.

Fig 1: Skin lesions in camel

Materials and Methods

Screening of suspected camel population for Dermatophytes infection in Jaipur city was carried out after clinical examination of the ailing animals with skin disorders. A total numbers of 22 camels in around Jaipur city were screened for this study after examining the skin lesions. The skin lesions were subjected to culture examination using Sabourauds's dextrose agar media followed by staining technique using LPCB. Identification of the dermatophyte species involved in these animals for causation of dermatophytosis was done by using urease test in urea agar media.

Results and Discussion

Fig 2: Culture of *T. mentagrophytes* in SDA

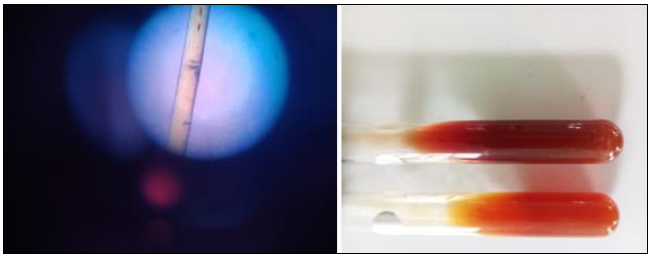

Fig 3: Formation of perpendicular pegs in hair by T. *mentagrophytes*. Urease reaction +ve red & control

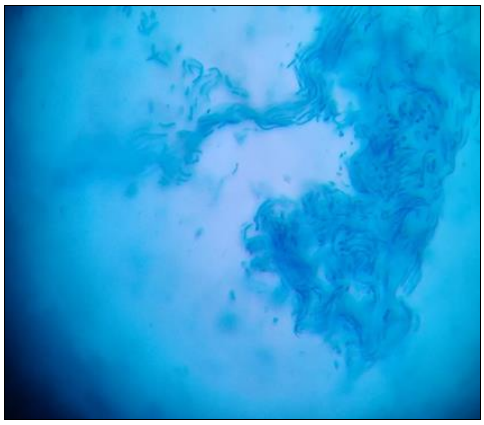

Fig 4: Micro conidia, chlamydospores & hyphae of *T. mentagrophytes*.

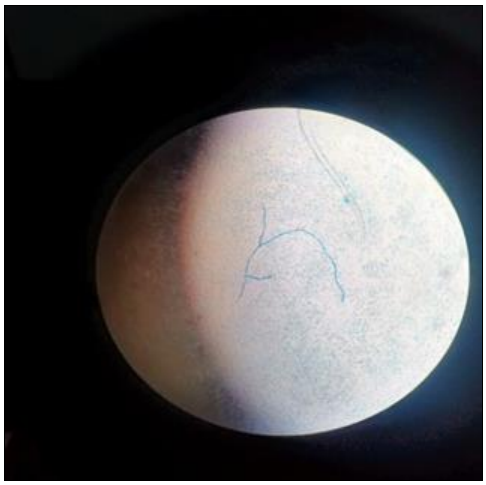

Fig 5: Microconidia & hyphae

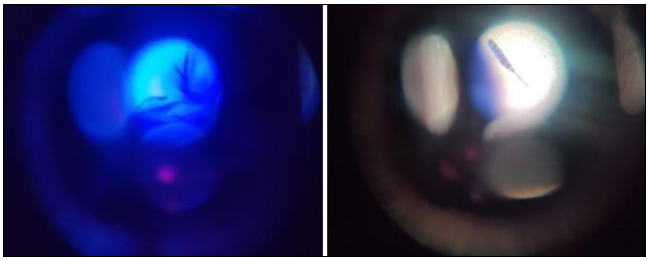

Fig 6: Macroconidia of *Trichophyton Mentagrophytes* in camel.

Poluri *et al.* (2015) [3] studied the culture of *T. mentagrophytes* and reported the spiral hyphae by SDA culture followed by LPCB staining. Wisal.G *et al.* (2010) [7] reported the prevalence of dermatophytes in camels in Sudan. The authors reported the prevalence of *Trycophyton verrucosum, T. schoenlenii, T. mentagrophytes* and T. *tonsurans* species in camels. Quinn *et al.* (2002) [4] reported the morphology of *Trichophyton mentagrophyte* as obverse, cream tan to buff and powdery, reverse buff tan to dark brown in color in SDA culture. William J. Hausler, JR *et al.* (1991) [6] differentiated *T. rubrum* from *T. mentagrophytes* by its color change in urea agar media by its ability to hydrolyze urea in urea agar media. In positive cases the color change from orange or pale pink to a purple red was indicating the presence of *T. mentagrophytes*. These observations coincide with the findings of this study for the confirmation of *T. mentagrophytes.*

Conclusion

Studies on the prevalence of deramatophytes infection in camel population were carried out in around Jaipur city. A total number of 22 camels were studied. Skin samples examination from these animals confirmed the prevalence of *Trichophyton mentagrophytes* in camel population in the studied area. Detailed study regarding the prevalence's of all dermatophytes species in camel population and their antifungal susceptibility tests needed to create a healthy camel population in general.

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