Trichophyton verrucosum
An uncommon zoophilic dermatophyte infection
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Introduction
*T. verrucosum* is a cosmopolitan zoophilic dermatophyte. The normal host for this organism is cattle and occasionally horses. Human infection is acquired through direct contact with these animals or contaminated fomites, usually following minor trauma to the skin.

Aim
To review cases of *T. verrucosum* infection diagnosed at Sullivan Nicolaides Pathology (SNP) over the past 5 years.

Method
The SNP data base from 2009 – 2014 was searched for isolates of *T. verrucosum*. This laboratory services Queensland and extends into New South Wales as far south as Coffs Harbour (Figure 1).

Results
Seven cases of *T. verrucosum* over a 5 year period time frame that identified more than 12,500 dermatophyte infections in total.

The most recent case (7) was a 54 year old retired meat worker who owns a small property with one beef and three dairy calves (Figure 2) all of which suffered from fungal infection (Figure 3 and 4). After clearing lantana and sustaining multiple scratches he developed a non healing inflammatory lesion on his forearm which healed after 3 weeks of oral griseofulvin with some residual scarring. Biopsy, bacterial and fungal cultures all demonstrated fungal infection and cultures grew *T. verrucosum* (Figure 5) and (Figure 6a,6b). Scrapings collected from his infected cattle also demonstrated large spore ectothrix infection and grew this dermatophyte (Figure 7).

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Figure 1: Area serviced by SNP

Figure 2: The motley crew!

Figure 3: Fungal involvement of face of beef cow

Figure 4: Scaly lesion on dairy cow – case 7

Figure 5: Culture of *T. verrucosum* on Sabauroud agar - slow growing, suede like, heaped and folded white colony with no reverse pigment.

Figure 6a: Culture microscopy of *T. verrucosum* showing characteristic terminal vesicles

Figure 6b: Typical chains of chlamydoconidia referred to as ‘chains of pearls’

Figure 7: Chains of large spore ectothrix infection of hair typical of *T. verrucosum*. Hair mounted in 10% KOH and Evans Blue.
Results contd

Histology is shown in (Figure 8a,8b,8c,8d). Cases included 6 males and 1 female (Table 1). The age ranged from 27–71, mean 45 years. All except one (Case 5) had association with cattle with one also with horses. The site of infection was the forearm 5 (Figure 9), leg 1 (Figure 10) and face 1 (Figure 11). Case 6 developed her leg lesion after birdwatching and camping on a cattle property although did not have direct contact with cattle. Three patients underwent skin biopsy and histology and in only one was hyphae seen on tissue sections. Four of five bacterial cultures also grew T. verrucosum on bacterial agar. Unlike other dermatophytes growth is enhanced at 37°C.

Although SNP coverage is state-wide, the cases were concentrated in SE Queensland and Northern NSW (Figure 1). Four of the cases required systemic antifungal therapy to clear and a number were treated with several courses of antibiotics prior to the diagnosis being established.

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Post Code</th>
<th>Location</th>
<th>Sex / Age</th>
<th>Site</th>
<th>Biopsy</th>
<th>Histo Report</th>
<th>Growth on Bact Media (37°C)</th>
<th>Fungal Microscopy</th>
<th>Contact</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>1</td>
<td>2474</td>
<td>Kyogle</td>
<td>M/32</td>
<td>Forearm</td>
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<td>N/A</td>
<td>No hyphae</td>
<td>Cattle</td>
<td>Bifonazole T</td>
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<td>2</td>
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<td>Avondale</td>
<td>M/64</td>
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<td>N/A</td>
<td>Yes hyphae 1+</td>
<td>Cattle / Horses</td>
<td>Terbinafine O</td>
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<td>3</td>
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<td>Yes hyphae</td>
<td>Cattle</td>
<td>No treatment</td>
<td></td>
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<td>Charleville</td>
<td>M/35</td>
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<td>Yes</td>
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<td>Yes hyphae</td>
<td>Cattle</td>
<td>Ketoconazole T</td>
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<tr>
<td>5</td>
<td>4601</td>
<td>Boonah</td>
<td>F/71</td>
<td>Lower leg</td>
<td>No</td>
<td>N/A</td>
<td>No hyphae</td>
<td>Cattle property (birdwatching)</td>
<td>Ketoconazole O</td>
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<td>6</td>
<td>2358</td>
<td>Kingstowm</td>
<td>M/29</td>
<td>Face</td>
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<td>N/A</td>
<td>Yes hyphae 1+</td>
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<td>Griseofulvin O</td>
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<td>7</td>
<td>4267</td>
<td>Buccan</td>
<td>M/54</td>
<td>Forearm</td>
<td>Yes</td>
<td>Hyphae</td>
<td>N/A</td>
<td>Cattle</td>
<td>Griseofulvin O</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Culture positive cases of T. verrucosum infection SNP 2009 – 2014

Conclusion

T. verrucosum is an unusual zoonotic infection of the skin causing a highly inflammatory response involving the scalp, beard or exposed areas of the body in contact with cattle and horses. Invaded hairs show an ectothrix infection and fluorescence under Wood’s ultra-violet light has been noted in cattle but not in humans. Unlike other dermatophytes, growth is enhanced at 37°C. Systemic therapy is usually required to clear the infection which is frequently mistaken for an inflammatory bacterial infection, initially being treated with antibiotics. Advice on clearing the infection from animals was seen as important.

Further information

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Line drawings

Larone DH  