CASE REPORT

MICROSPORUM NANUM: A CAUSE OF PORCINE RINGWORM IN ONTARIO

J. R. LONG, A. C. BRANDENBURG AND P. G. OLIVER*

Introduction

Microsporum nanum, a common cause of ringworm in swine, and occasionally in man, was first isolated in Cuba in 1954 (8). Infection by this fungus was first reported in swine in the United States (4) in 1964. American workers (1, 7, 9) studied this infection extensively in swine and reproduced it (10) in that species. Infection by *M. nanum* has been studied by New Zealand (2, 14) and Australian workers (6) and the infection has been reproduced in swine, by the latter group.

This fungus has been isolated from soil (1, 14) on which pigs were pastured. Ajello *et al* (1) found mature macroconidia (macroaleuriospores) in soil samples indicating that *M. nanum* grows in the soil of a swine habitat. Thus man can contact this dermatophyte from soil or from its natural host, swine.

Mullins *et al* (12) report two cases of *M. nanum* in swine farmers and Baxter (2) contacted the disease while studying *M. nanum* in New Zealand. This organism has been isolated from two human infections in Canada; one in Alberta (5) and the other in Windsor, Ontario (Fischer, J. B., personal communication, 1972).

This report discusses the isolation of *M. nanum* from two swine herds in southwestern Ontario. This is believed to be the first report of the isolation of *M. nanum* from swine in Canada.

History and Clinical Examination

Case 1 A three-year-old Yorkshire sow was admitted to the swine clinic, Ontario Veterinary College for cesarean section. Ten days after admission skin lesions suggestive of ringworm, were observed on her right shoulder, flank and udder (Figure 1). The lesions were flat, 5–8 cm in diameter and reddish brown in colour. The affected skin had a scurfy appearance without loss of hair or evidence of pruritus.

The lesions were thoroughly cleansed with 70% alcohol and skin scrapings were taken for fungus culture. The lesions were then treated topically with Weladol disinfectant[1] every second day for ten days.

This sow came from a farm having approximately 50 sows, none of the rest had skin lesions.

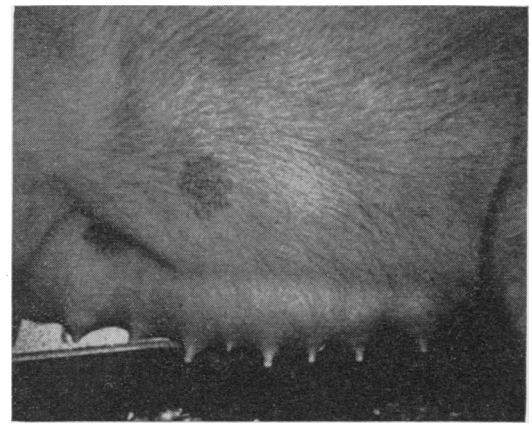

FIGURE 1. *M. nanum* lesions ten days after sow's admission to the clinic.

Case 2 This herd consisted of ten Lacombe and approximately 50 Yorkshire X Landrace sows. All dry sows had free access to an unpaved exercise yard and pasture. During a routine herd health inspection a skin condition was observed in 20% of the sows; nursing pigs were not affected. Lesions were most noticeable behind the ears and along the neck; however, they were also present on the flanks, buttocks and lower legs.

In the affected area behind the ears brownish-orange flaky lesions were common, but in other areas of the body they tended to be slightly crusty and light brown in colour. All lesions were superficial, flat and slightly roughened. Alopecia and pruritus were absent.

*Department of Veterinary Microbiology and Immunology (Long), Department of Clinical Studies (Brandenburg), Ontario Veterinary College, University of Guelph, and Veterinary Services Branch (Oliver), Ontario Department of Agriculture and Food, Guelph, Ontario, Canada.

[1]Weladol Disinfectant. Pitman-Moore, Division of Dow Chemicals of Canada, Limited, Don Mills, Ontario.

FIGURE 2. Porcine ringworm due to *M. nanum*. Approximately 20% of mature sows had similar skin lesions.

The lesions varied in size from 3–20 cm in diameter and all had circular peripheries (Figure 2). Ringworm was suspected and skin scrapings were taken for fungus culture, from lesions previously cleansed with 70% alcohol.

Six soil samples were taken for fungus isolation from the pasture and exercise yard. The affected pigs were treated daily for seven days with topical applications of Weladol disinfectant.

Results

All skin scrapings were inoculated on Sabouraud dextrose agar (Difco)[2] and incubated for one week at 26°C. Fungus colonies with a buff coloured powdery surface and reddish brown undersurface, typical of *Microsporum nanum* (13), developed in seven days. Microscopic examination of colonial growth revealed large numbers of rough thick-walled macroaleuriospores (Figure 3). These had from one to three cells.

Soil samples from case 2 were negative for *M. nanum* by the standard hair baiting technique. However, one sample was positive for *M. gypseum* a dermatophyte known to be geophilic (11).

The lesions on the sow of case 1 healed readily. In case 2, there was only limited improvement following the treatment regime outlined above.

Discussion

In case 1, the sow was housed in a pen at the Ontario Veterinary College clinic which three weeks previously had held a sow suspected of having ringworm, but repeated attemps to isolate dermatophytes from lesions were unsuccessful. Although the pen had been thoroughly cleaned, disinfected and left vacant for three weeks, we suspect our first case became infected here. The sow had no skin lesions on admission and they did not develop until ten days later. The udder lesion was unusual because infection rarely occurs on thinly haired body areas.

No other pigs in the herds from which case 1 or the suspected carrier sow came had clinical signs of ringworm.

In case 2, the percent morbidity and clinical aspects were similar to those reported by Ginther (9). He observed that lesions first appeared at the caudal base of the ear and were most common in this area. Our findings were similar (Figure 2). The owner reported that the lesions were less noticeable following a rain, presumably because the brownish orange flaky debris was washed from affected areas, and they were sometimes obscured by dirt and mud. Several sows with numerous lesions were nursing litters, but none of the young pigs was affected. In a study of 24 swine herds infected with *M. nanum*, Ginther (9) found only four in which young pigs were involved. There is no explanation for this observation.

No pigs had come into the herd from the United States, where *M. nanum* is common in

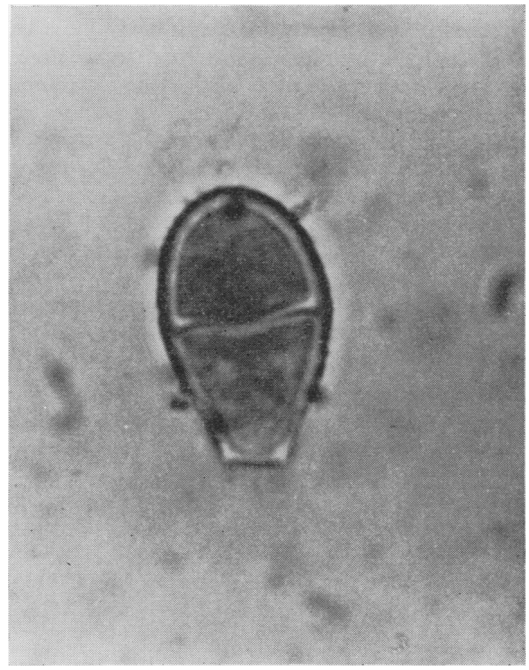

FIGURE 3. Typical rough, thick-walled macroaleuriospore of *M. nanum* containing two cells. ×730.

[2]Difco Laboratories, Detroit, Michigan.

swine in several states (1, 7, 9, 10), but sows had been introduced from Alberta and from other areas of Ontario. These are the two provinces from which *M. nanum* has been isolated from man.

Little has been reported on the treatment of this condition in swine. In case 1 the lesions were mild and it is difficult to assess whether or not treatment had any effect. It appeared to cause only slight improvement in the sows in case 2. Ginther (9) considered copper naphthenate[3] beneficial, and Connole and Baynes (6) suggest spraying with copper sulphate or Bordeaux mixture. Since *M. nanum* lives and multiplies in soil of swine lots (1, 11, 14), the soil can act as a continual source for reinfection, making elimination by treatment extremely difficult.

In neither of these cases were members of the farm family infected, although *M. nanum* is known to cause ringworm in man (1, 2, 3, 5, 8, 12, 13).

Summary

M. nanum was isolated from swine on two farms in southwestern Ontario. The clinical aspects of porcine ringworm caused by this fungus are discussed and the ecology of the organism is reviewed. There were no cases of ringworm due to *M. nanum* in either of the two farm families.

Résumé

Les auteurs ont isolé *M. nanum* dans deux troupeaux de porcs, au sud-ouest de l'Ontario. Ils commentent les signes cliniques de la teigne porcine causée par ce champignon et présentent des données relatives à l'écologie du micro-organisme. Aucun membre des familles vivant sur ces fermes ne fut atteint de la teigne causée par *M. nanum*.

Acknowledgments

The authors wish to thank Mr. J. B. Fischer, Mycologist, Public Health Laboratory, Ontario Department of Health, Toronto, for confirming the identification of our isolates. We also thank Dr. S. Djurickovic for arousing our interest in this clinical entity.

[3]Copersol. Ormond Veterinary Supplies Ltd., Hamilton, Ontario.

References

1. Ajello, L., E. Varsavsky, O. J. Ginther and G. Bubash. The natural history of *Microsporum nanum*. Mycologia 56: 873–884. 1964.
2. Baxter, M. Danger of contact infection from pig ringworm. N.Z. vet. J. 17: 69. 1969.
3. Brock, J. M. *Microsporum nanum*: a cause of tinea capitis. Archs Derm. 84: 504–505. 1961.
4. Bubash, G. R., O. J. Ginther and L. Ajello. *Microsporum nanum*: First recorded isolation from animals in the United States. Science 143: 366–367. 1964.
5. Carmichael, J. W. and J. F. Reid. *Microsporum nanum* infection in Alberta. Mycopath. Mycol. appl. 17: 325–326. 1962.
6. Connole, M. D. and I. D. Baynes. Ringworm caused by *Microsporum nanum* in pigs in Queensland. Aust. vet. J. 42: 19–24. 1966.
7. Dodd, D. C., R. W. Newlin and G. R. Niksch. Infection of swine with *Microsporum nanum*. J. Am. vet. med. Ass. 146: 486–489. 1965.
8. Fuentes, C. A., R. Aboulafia and R. J. Vidal. A dwarf form of *Microsporum gypseum*. J. Invest. Derm. 23: 51–61. 1954.
9. Ginther, O. J. Clinical aspects of *Microsporum nanum* infection in swine. J. Am. vet. med. Ass. 146: 945–953. 1965.
10. Ginther, O. J. and G. R. Bubash. Experimental *Microsporum nanum* infection in swine. J. Am. vet. med. Ass. 148: 1034–1037. 1966.
11. Kaplan, W. Epidemiology and public health significance of ringworm in animals. Archs Derm. 96: 404–408. 1967.
12. Mullins, J. F., C. J. Willis, J. R. Bergeron, D. A. Johnson and O. J. Stone. *Microsporum nanum*: Review of the literature and a report of two cases. Archs Derm. 94: 300–303. 1966.
13. Rebell, G. and D. Taplin. Dermatophytes, Their Recognition and Identification. Second Edition. Coral Gables, Florida: University of Miami Press. 1970.
14. Smith, J. M. B. and I. J. Steffert. *Microsporum nanum* in New Zealand pigs. N.Z. vet. J. 14: 97. 1966.