Experimental Infection on a Horse with Microsporum canis from Equine Ringworm

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Trichophyton equinum is the main causal agent of equine ringworm [1, 4, 6–11], while Microsporum canis [3, 5, 6, 12] and Microsporum equinum [1, 2] have also been isolated from lesions of equine ringworm as the etiologic agents.

Present authors have been studying on equine ringworm since 1976 in a farm at Hidaka district, Hokkaido where more than 200 thoroughbred breed were kept. The rate of the infection in that farm were exceeding 80% in each year.

As the causal agent, Trichophyton equinum (33 out of 99 cases examined) was isolated from skin lesions and Microsporum canis was also cultured independently (18 out of 99 cases examined) or with T. equinum (7 out of 99 cases examined). From these findings the authors carried out the experimental infection with M. canis M# 395-3 isolated from the spontaneous case on 3 healthy horses of 6 month-old.

The mycological findings of M. canis M#395-3 were as follows; the colony on potato dextrose agar showed 45 mm in diameter in the end of 12 days at 30°C. The surface was flatty with pale brown to dull cream color (Fig. 1). In microscopical findings, echinuluted and thick walled macroconidia were moderately produced on sterile polished rice medium. The size was 7 to 15×70 to 95 μm. Microconidia were few or absent on rice medium and potato dextrose agar in 2 weeks. The isolate of M. canis (strain No. M#395-3) did not perforate equine and human hair in in vitro assay. The urease was produced in urea medium. The ascigerous forms could not be produced by the mating with Nannizzia oita (++) and (-) strains.

The experimental infection was carried out on two regions of cervical skin of 3 horses of 6 month-old. After shaving the skin hairs and rubbing on the skin with sand paper, M. canis M# 395-3 suspended in liquid paraffin (about 1×105 fungal segments) was dropped on each region of the skin. The skin lesion was found only in one horse. It was first small and then changed to round form of 3.0 cm to 3.5 cm in diameter covered with thick crust on 35 days after inoculation (Fig. 2). The recovery of infection was very slow, about 65 days after developing of the initial skin lesions. From this experiment, M. canis M# 395-3 was considered to be slightly
pathogenic to the healthy horses.

In micropathological findings of the crust, fungal sheath of small spores of 2 to 5 μm in diameter were observed around the infected hairs (Fig. 3). On histological examination of the skin lesions, fungal sheath around hairs in follicles was also observed (Fig. 4). Additionally, the isolate like M. canis M# 395-3 was recovered from the lesions (Fig. 5). In Wood’s lamp examination of the skin lesions, fluorescence was scarcely observed.

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REFERENCES


EXPLANATION OF FIGURES

Fig. 1. Colony on potato dextrose agar growing somewhat rapidly, attaining a diameter of 45 mm in 12 days at 30°C.

Fig. 2. Ringworm lesions of cervical skin regions at 35 days after experimental inoculation of Microsporum canis.

Fig. 3. Formation of fungal sheath around infected hair at ringworm lesion (35 days after experimental inoculation). ×800.

Fig. 4. Histological changes of skin biopsied. Fungal sheath in hair follicle was seen. Hematoxylin and cosin stain. ×1000.

Fig. 5. M. canis isolated from the lesion caused by experimental inoculation.

要約

馬の白癖から分離された Microsporum canis の馬に対する人工感染（総報）：一条 茂・小西辰雄・高鳥昭介1, 田中一郎2（福岡薬科大学薬学部薬学教室, 1)食品薬品安全センター 秋田研究部, 2)エーザイ株式会社）——北海道日高地方の1種の馬育成場で多発した馬白癖の原因菌学的検索をおこない, Trichophyton equinum 感染例のほかに Microsporum canis 感染例および両者の混合感染例を確認した。分離された M. canis M#395-3 株を 6 ヶ月齢の健康馬と 3 頭の皮膚に感染を試みた結果、1頭のみに接種後 25 日日から 65 日間にわたり病巣が認められ、生検により患部被毛の菌落形成を認め、組織学的に本菌の感染を確認し、また患部から M. canis を分離した。M. canis M#395-3 株は米粒培地で大型分生子を産生するが、小型分生子は産生されなかった。尿素培地でウレアーゼを産生したが、ヒトおよび馬の被毛に対する穿透性はみられなかった。Nannizzia otae (±) のおよび (−) 株との交配試験は成績しなかった。