First Isolation of *Sarcocystis hominis* from Cattle in Japan

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**ABSTRACT.** *Sarcocystis hominis* was first isolated from slaughtered cattle raised in Japan. Cysts were 1,220–4,460 × 80–384 µm in size and their wall was 3 to 6 µm thick and appeared radially striated in the histopathological sections because of the presence of palisade-like villar protrusions on the surface. The protrusions were 3.1–4.3 × 0.7–1.1 µm in size and had many microtubules in the core. Two cynomolgus monkeys, *Macaca fascicularis*, fed with the *Sarcocystis* cysts began to pass sporocysts, which measured a size of 14.3–15 × 9.5–10 µm, in the feces 10 days after ingestion.—**KEY WORDS:** cattle, cynomolgus monkey, *Sarcocystis hominis*.


Three species of *Sarcocystis* have been recorded from cattle: *S. cruzi*, *S. hirsuta*, and *S. hominis* [1, 3]. All these species except *S. hominis* have been detected from Japan [5, 8]. This paper deals with the first isolation of *S. hominis* from cattle in Japan.

Five 4 to 6-year-old Holstein cattle, which were raised at a farm in Fukaya city, Saitama Prefecture, were slaughtered at an abattoir in Saitama Prefecture.

Fresh cysts removed from the infected diaphragm muscle were measured with a micrometer under a light microscope. The tissues infected with cysts and cysts freshly removed were fixed in 10% formalin, embedded in paraffin, sectioned, and stained with hematoxylin and eosin through the routine procedure. Some formalin-fixed tissues and cysts were postfixed in 1% osmium tetroxide solution, after that the specimens were processed for electron microscopic observation.

Four of the 5 cattle examined were positive for the cyst. Fresh cysts measured a size of 1,220–4,460 × 80–384 µm (n=40) and the cyst wall was thick, 3–6 µm, and was observed radially striated by the presence of palisade-like villar protrusions on the cyst wall. Transmission and scanning electron micrographs showed that the protrusions measured a size of 3.1–4.3 × 0.7–1.1 µm, including many microtubules in the core.

Ten fresh cysts each were orally given to 2 3-month-old female mongrel dogs, 2 6-month-old female domestic cats, and 2 16- and 18-year-old female cynomolgus monkeys, *Macaca fascicularis*, with a small amount of pet food. One 3-month-old female mongrel dog, 1 6-month-old female domestic cat and 1 17-year-old male cynomolgus monkey were used as uninfected controls.

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**Fig. 1.** Fresh *Sarcocystis hominis* cyst from diaphragm muscle of cattle. × 200.

**Fig. 2.** Thick-walled cyst of *S. hominis* in diaphragm muscle of cattle. H. E. stain, Bar=10 µm × 400.
All the animals were daily examined for *Sarcocystis* sporocysts in the amount of feces by the flotation method with a saturated NaCl solution.

Two cynomolgus monkeys fed with fresh cysts passed sporocysts in the feces from 10 to 30 days after inoculation when the examination terminated. Two dogs and 2 cats fed with cysts and the non-inoculated controls, however, excreted no sporocysts in the feces throughout the experimental period. Ellipsoidal sporocysts passed in the feces were 14.3–15 × 9.5–10 µm (n=50) in size and contained 4 sporozoites and 1 large internal residual body.

Cysts of *S. hominis* attain to a length of 4,700 µm and have the thick wall which is provided with palisade-like villar protrusions on the surface [2, 3, 6, 7, 9]. Cysts of the present species also had the thick wall provided with palisade-like protrusions by histopathological and electron-microscopic observations.

Host specificity is also an important clue to identify *Sarcocystis* species. Bovine *Sarcocystis* species reported are *S. cruzi*, *S. hirsuta*, and *S. hominis* [1, 3]. Of these species only *S. hominis* utilizes humans and monkeys as the final host, and dogs and domestic cats are not successfully infected with *S. hominis* [4]. Cynomolgus monkeys orally inoculated with fresh cysts of the present species shed sporocysts in the feces, but dogs and cats did not.

The prepatent period of *S. hominis* was reported to be 9 to 10 days and the measurement of sporocysts to be 14.1–15.5 × 9.3–10.8 µm [4]. The prepatent period and size of sporocysts of the present species were similar to those reported previously on *S. hominis*.

Judging from the above morphological features of cysts and sporocysts and host specificity, we identified the present species as *S. hominis* Dubey, 1976.

**REFERENCES**