

**ECHINOPARYPHIUM OSCITANSI N.SP. (TREMATODA: ECHINOSTOMATIDAE):
NATURAL INFECTION IN ASIAN OPEN-BILLED STORKS (*ANASTOMUS OSCI-
TANS*; AVES: CICONIIDAE) IN THAILAND**

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ABSTRACT

*In examining 71 Asian open-billed storks (*Anastomus oscitans*), *Echinoparyphium oscitansi* n.sp. was recovered from the intestinal lumen of 3 storks with concurrent infection by *Chaunocephalus ferox*, found in cysts forming in the intestinal wall. The adult *E. oscitansi* n.sp. had only 25 collar spines. The morphology and structure of the adult fluke are given. Four spines were grouped on each corner, 4 arranged singly on each side and the remainder arranged in two alternate rows, orally and aborally. All spines were equal in size. Vitellaria were small follicles that extended from the posterior to the level of the ovary. The uterus was short and contained a few comparatively large eggs. It does not resemble any of the described species of genus *Echinoparyphium* except *E. jubilarum*, which possesses 27 collar spines and is larger than *E. oscitansi* n.sp.*

INTRODUCTION

Trematodes recovered in Asian open-billed storks (*Anastomus oscitans*) are in the Families Strigidae, Diplostomatidae, Cyathocotylidae and Echinostomatidae.¹⁻⁴ Some members of the Diplostomatidae and Echinostomatidae families, such as *Chaunocephalus ferox* of the Echinostomatidae, often caused death in storks. This trematode is known to cause death in both white (*Ciconia ciconia*) and Asian open-billed storks.⁵⁻⁷

An undescribed *Echinoparyphium* species with 25 collar spines was recovered from Asian open-billed storks. The purpose of this paper is to report on the morphology of the adult worm of this undescribed species and propose it as a new species.

MATERIALS AND METHODS

With the permission of the Royal Forest Department, 71 Asian open-billed storks (66 juveniles and 5 adults) were captured from Wat Phai Lom bird sanctuary, Ampoe Sam Kok, Pathum Thani Province. Storks were captured alive by mist nets.

The captured storks were sacrificed and the visceral organs were all removed and examined for parasites. The parasites were counted and transferred to a petri-dish containing 0.85% NaCl for further preparation, i.e. relaxed, fixed in AFA fixative, then stained in Semichon carmine, dehydrated, cleared and mounted in Caedax. Specimens have been deposited in the Museum of Malacology and Entomology, Faculty of Science, Mahidol University under accession number MUFSP 00002.

A total of 452 snails (*Pila* sp.) were collected from stork feeding grounds. All organs of each snail were processed for the examination of larval stages.

RESULTS

Adult fluke: *Echinoparyphium oscitansi* n.sp. was recovered from 3 of the 71 Asian open-billed storks examined (prevalence of infection was 4.2%). This fluke was found in the lumen of the small intestine. Another fluke species, *C. ferox* was found concurrently pairing in cysts forming in the wall of the small intestine (prevalence of infection was 80.3%). *E. oscitansi* n.sp. was very small and did not have many collar spines. Numerous haemorrhagic spots were observed in the intestinal lumen and corresponded to the number of worms. The number of worms found in each of the 3 infected storks was 1, 212 and 298. The following morphology and measurements are based on 20 specimens (see Figs.1 and 2).

Shape: Fresh specimens often curled themselves into a U or comma shape.

Size: The length varied from 1.4-2.76 mm, with a mean of 2.31 ± 0.28 mm. The width at the widest part of the body varied from 0.22–0.36 mm, with a mean of 0.278 ± 0.55 mm.

Head collar: The head collar had 25 spines consisting of 9 spines of equal size arranged alternately into two rows, orally and aborally. Four spines were arranged singly on each lateral and 4 spines were grouped on each corner.

Body covering: The anterior half of the body surface from oral sucker to ventral sucker was covered with minute spines.

Ventral sucker: The ventral sucker or acetabulum was located about half way between the oral sucker and the mid-body. It was clearly seen raised well above the body surface in fresh specimens. It was large and occupied almost the whole body area in the region. The diameters varied from 0.17–0.234 mm, with a mean of 0.193 ± 0.024 mm.

Oral sucker and digestive tract: The oral sucker was much smaller than the ventral sucker. The diameters varied from 0.042–0.056 mm with a mean of 0.047 ± 0.005 mm. The prepharynx was short and the muscular pharynx was about the same size as the oral sucker. The esophagus bifurcated anterior to the ventral sucker. The caeca continued laterally but their terminations could not be differentiated.

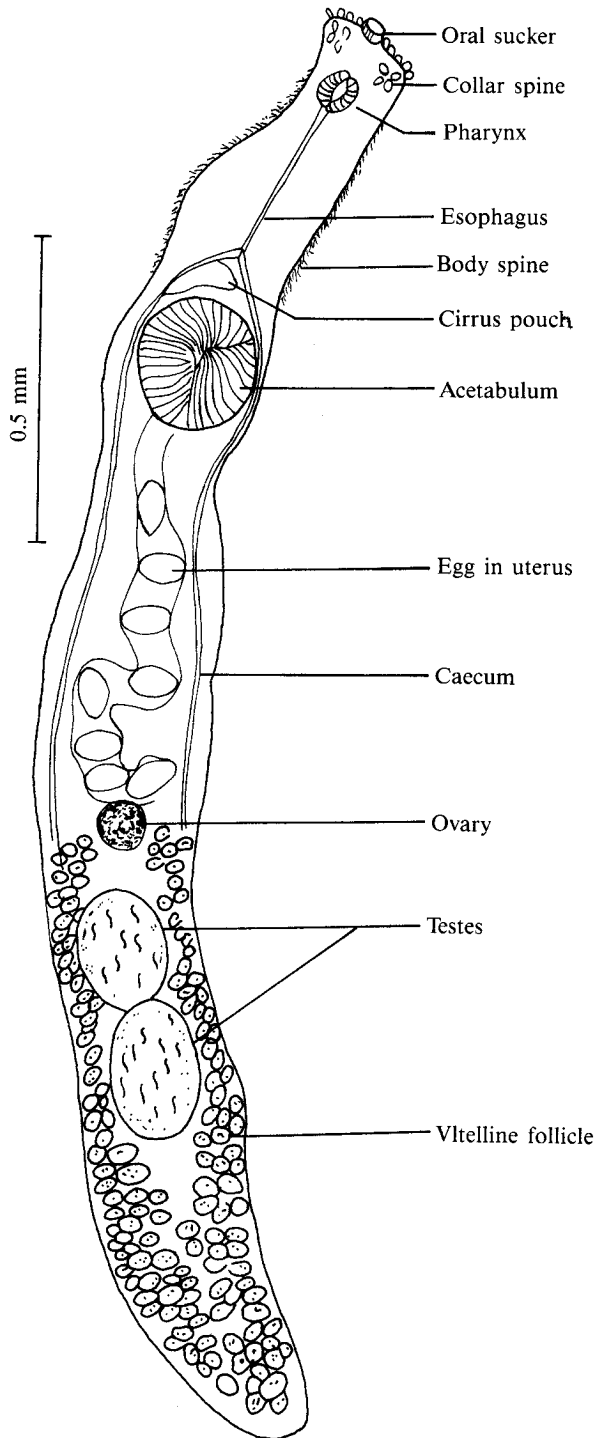


Fig.1 A diagram of the structure of an adult *Echinoparyphium oscitansi* n.sp. recovered from Asian open-billed storks.

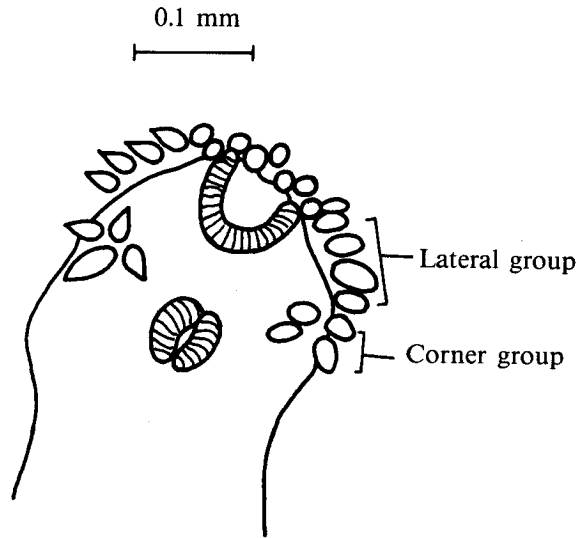


Fig.2 A diagram of the arrangement of collar spines of *E. oscitansi* n.sp.

Reproductive organs: The ovary was round and located in the posterior half close to the midline. The diameters varied from 0.063–0.085 mm, with a mean of 0.073 ± 0.006 mm. Neither the seminal receptacle nor *receptaculum seminis uterium* were seen. The uterus was almost straight with only a few eggs arranged singly in the tube. The uterus opened at the common genital pore.

Posterior to the ovary were the two tandemly arranged testes which were oval. They were almost equal in size. The anterior testis varied from 0.156–0.234 mm by $0.092 - 0.184$ mm, with a mean of 0.190 ± 0.025 mm by 0.134 ± 0.023 mm. The posterior testis was 0.127–0.276 mm by $0.099 - 0.213$ mm, with a mean of 0.21 ± 0.038 mm by 0.137 ± 0.031 mm. The cirrus pouch was distinct and located between the bifurcation of the esophagus and the acetabulum. The pouch opened at the common genital pore. The cirrus was short and indistinct, with a mean size of 0.185 ± 0.039 mm by 0.06 ± 0.02 mm.

The vitellaria were confined laterally and posteriorly to the ovary.

Eggs and miracidia: Eggs were ovoid and brown. The sizes were relatively large and varied from 0.108–0.126 mm in length (mean 0.117 ± 0.009 mm) and 0.72–0.09 mm in width (mean 0.073 ± 0.005 mm).

The miracidia developed inside the eggs within 7 days at room temperature (28–30°C) and were found to hatch spontaneously from day 10 onward.

DISCUSSION

The adult fluke has the characteristic morphology of the genus *Echinoparyphium* described by Yamaguti.¹ These characteristics are a short uterus with few eggs, the vitellaria in the form of small follicles do not extend beyond the ovary.

There was only one species of *Echinoparyphium* on record with the number of collar spines close to 25, *E. jubilarum* from a Eurasian kestrel, *Falco tinnenculus*, with a size not smaller than 4.5 mm and having 27 collar spines and without body spines. However, *E. jubilarum* was finally included under genus *Petasiger*, subgenus *Neopetsiger*.⁸ The genus *Petasiger* usually possesses 27 collar spines, of which the 4 largest ones on each side from the corner spines, with the remainder decreasing in size towards the median plane. Vitellaria follicles extend forward beyond the ventral sucker. Testes are transversely ovoid or lobed and slightly flattened.⁹

Regarding the size of *E. oscitansi* n.sp., there are two other *Echinoparyphium* species of similar size given by Yamaguti,¹ *aconiatum* and *elegans*. Neither species exceeds 3.0 mm in size. However, the former species bears 37 collar spines and the latter 43 spines. The difference in the number of collar spines is too great for it to be considered belonging to either of these two species. Therefore, the present species is considered to be a new species of *Echinoparyphium*. The name “*oscitansi*” is proposed.

Examination of 452 *Pila* snails, the major food supply of Asian open-billed storks, and of 83 *Filoparudina* snails failed to find any other larval stages such as cercaria or metacercaria of *E. oscitansi*. This, perhaps, is due to the low prevalence of this fluke in the intermediate snail hosts. It is also possible that the fluke uses other animals or substances as intermediate host or agent.

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บทคัดย่อ

จากการศึกษาปากห่าง (*Anastomus oscitans*) จำนวน 71 ตัว นั้น มีนกกปากห่าง 3 ตัว ที่ติดเชื้อพยาธิใบไม้ชนิดใหม่คือ *Echinoparyphium oscitansi* n.sp. อยู่ในช่องลำไส้ (intestinal lumen) และยังมีพยาธิใบไม้ อีกชนิดหนึ่งที่พบร่วมกัน คือ *Chaunocephalus ferox* และพยาธิชนิดนี้พบว่าอยู่ภายใน cyst ซึ่งถูกสร้างขึ้นในผนัง ลำไส้ของนกกปากห่าง *E. oscitansi* n.sp. นี้มีลักษณะสำคัญคือ มีหนามบริเวณ oral sucker (collar spines) ขนาด เท่า ๆ กันจำนวน 25 อัน หนาม 9 อัน เรียงสลับกันเป็น 2 แถว บน-ล่าง ต่อด้วยข้างละ 4 อัน เรียงเดี่ยว แล้วสิ้นสุด ด้วยกลุ่มของหนามข้างละ 4 อันทางด้านหน้า Vitellaria จัดตัวเป็นกลุ่มเล็ก ๆ กระจายจากส่วนล่างของลำตัวขึ้นไปจนถึงตำแหน่งของรังไข่ (ovary) มดลูก (uterus) สันมีไข่ขนาดใหญ่จำนวนเล็กน้อยอยู่ใน พยาธิใบไม้ชนิดนี้มี ลักษณะที่แตกต่างไปจากพยาธิใบไม้ใน genus *Echinoparyphium* ชนิดอื่น ๆ ที่ได้เคยมีผู้พบและบรรยายลักษณะไว้ มีเพียงชนิดเดียวคือ *E. jubilarum* ซึ่งมีจำนวนหนาม (collar spines) ใกล้เคียงคือ 27 อันแต่มีขนาดตัวใหญ่กว่า *E. oscitansi*