[Jap. J. Parasit., Vol. 32, No. 3, 177-182, June, 1983]

A New Echinostome Trematode, *Patagifer toki* sp. n., from the Japanese Crested Ibis, *Nipponia nippon*

CHIKAGE ONDA, SOICHI IMAI AND TOSHIO ISHII

(Received for publication; January 31, 1983)

Key words: Echinostomatidae, *Nipponia nippon*, *Patagifer toki* sp. n., trematode

Recently, some Japanese crested ibises were captured at Sado-island, Niigata Pref. on the purpose of artificial reproduction. Of them, however, one was died soon after the capture. When the pathological examination of it was done at the Department of Veterinary Pathology, University of Tokyo, 20–30 flukes were detected from the upper part of the small intestine. Some of these flukes were examined with light and scanning electron microscopes for the purpose of their classification. As a result, it was concluded that these were new species of the genus *Patagifer* Dietz, 1909 and described as *Patagifer toki* sp. n.

Materials and Methods

The specimens examined were 6 individuals in the condition of sticking to the small intestine of the ibis. All the specimens had been fixed and preserved in 10% formalin solution for the pathological investigations. These specimens were separated from the wall of intestine and washed with running water for over night. After pressing, 3 of them were refixed in Bouin's solution. Then they were stained with borax-carmine, dehydrated with ethanol series, and mounted. The other 3 specimens were refixed with 2% osmium tetroxide, dehydrated, and dried in accordance with general methods (Tanaka and Nagatani, 1980). Dried specimens were examined with JEOL 25S-III scanning electron microscope.

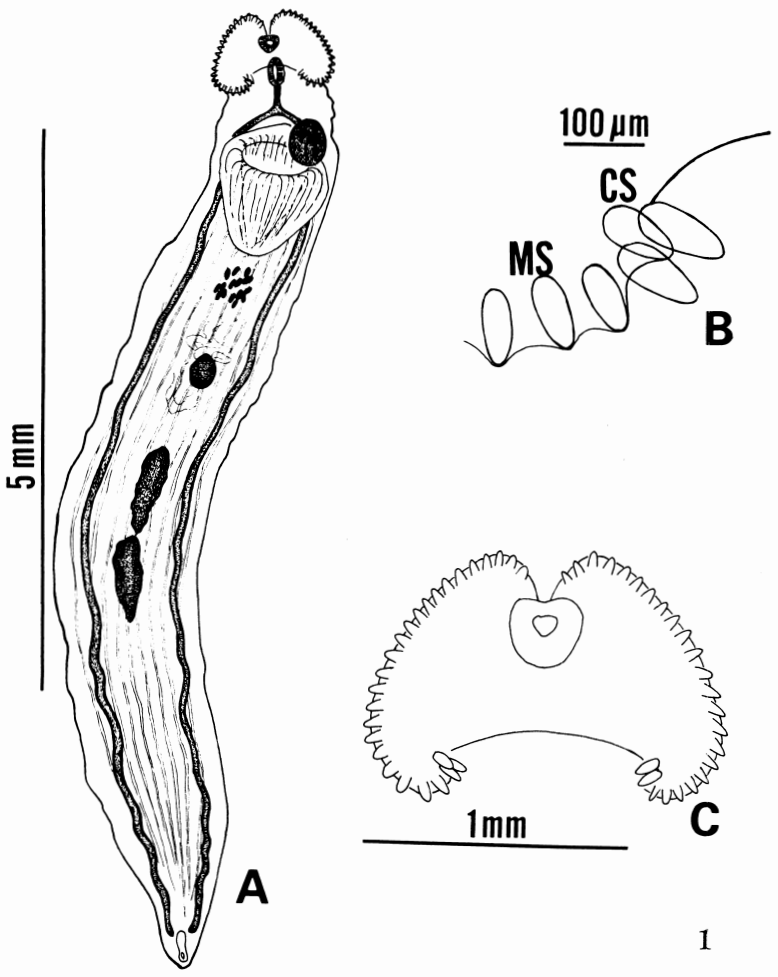
Department of Parasitology, Nippon Veterinary and Zootechnical College, Musashino-shi, Tokyo 180, Japan.

Description

Patagifer toki sp. n.
(Figs. 1–6)

Diagnosis– Body elongate and cylindical, 9.0–10.4 by 1.9–2.6 mm. Head collar with 2 lobes, narrower than the body. 21–23 marginal spines and 3 corner spines per one side of the collar. Cirrus pouch overlapped on the anterior left part of large acetabulum. 2 testes indefinite oval at the posterior center of body. Ovary spherical at the middle center of body.

Description– The body is cylindical and elongated with the well developed head collar at the anterior end. The length is 9.0–10.4 mm and the maximal width 1.9–2.6 mm. The head collar is narrower than the body width and measures 1.3–1.5 mm. It is divided into 2 lobes from dorsal incision. The ventral angles are slightly separated (Fig. 5). There are 21–23 spines in a single row along the edge of the collar on each side (Fig. 3). All of them are rod-shaped with blunt ends. Some of them are look to be covered with membrane (Fig. 4). On each ventral angle of the collar, there are 3 spines directed inward, which are

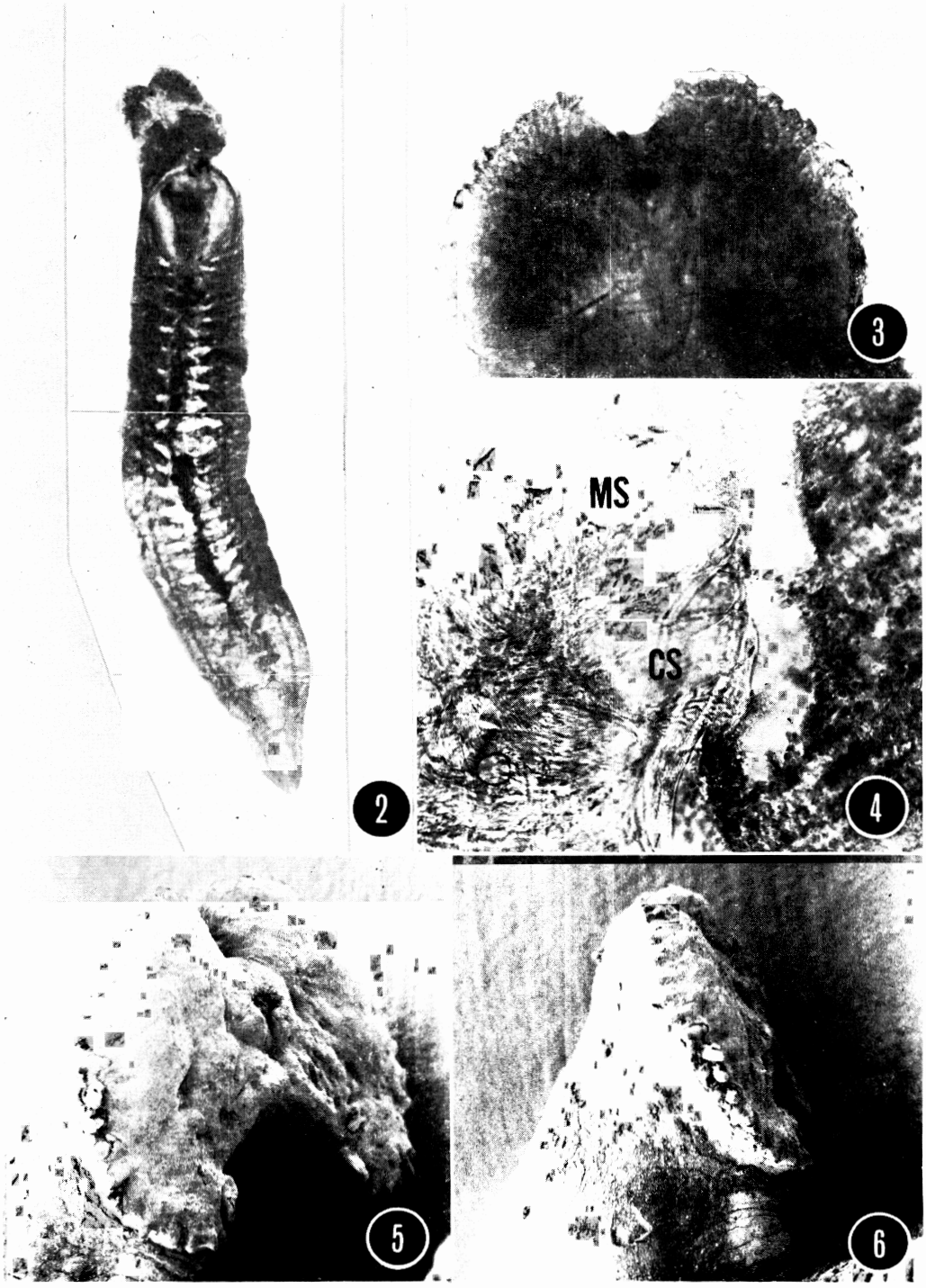


Explanation of Figures

Fig. 1 *Patagifer toki* sp. n.
A. Whole body. Ventral view.
B. Corner and marginal spines. CS: corner spine; MS: marginal spine.
C. Head collar.

Figs. 2–4 Photomicrographs of *Patagifer toki* sp. n.
2 Whole body of holotype. Ventral view. ×12.
3 Head collar. Ventral view. ×60.
4 Marginal and corner spines of the head collar.
CS: corner spine; MS: marginal spine. ×200.

Figs. 5–6 Scanning electron micrographs of the head of *Patagifer toki* sp. n.
5 Ventral view. ×43.
6 Right view. ×43.


MS
CS
2
3
4
5
6

not lying as in the series with the row of marginal spines. These spines are almost similar size, 100–120 μm long by 30 μm width, except smaller those nearby the oral sucker. Round oral sucker, 275–300 by 250–300 μm, is located at the center of the anterior part of the head collar (Figs. 3, 5). Behind it, there is an elongated pharynx measuring 300–400 by 175–225 μm. The acetabulum is large and prominent, measuring 1.50–1.78 by 1.05–1.23 mm. It is situated at just behind the head collar. The cirrus pouch, 400 by 500 μm, is overlapped on the anterior left part of the acetabulum. The esophagus, 280–480 μm, is situated in front of the acetabulum. Intestinal ceca run parallel to the right and left sides of body and terminate as *cal-de-sacs* at the posterior extremity. Two testes are indefinite ellipsoidal and lie one behind the other on the median line of the posterior part of the body. The anterior testis measures 550–800 μm long and 280–380 μm in width, and posterior one 700–900 by 280–340 μm. The ovary is almost spherical, 300 by 170–300 μm, and situated at the center of the body. In the uterine coils there are the eggs which are oval-shaped and measures 94 μm long by 49 μm broad.

Discussion

The species of the genus *Patagifer* are found out from the intestine of birds, especially Threskiornithidae containing ibis, and 13 species have been described hitherto (Table 1). To classify this genus, the number and disposition of the spines of the head collar have been the most important characters (Lumsden, 1962; Skrjabin, 1964). According to it, *P. toki* resembles to *P. acuminatus* Johnston, 1917 and *P. vioscai* Lumsden, 1962 in the point of possessing 3 corner spines. The number of marginal spines of *P. acuminatus*, however, differs apparently from the present species. The range of the number of marginal spines

Table 1 Species of the genus *Patagifer* and their hosts described hitherto

Species	Host	Distribution
P. acuminatus Johnston, 1917	*Ibis molucca*	Australia
P. bilobus (Rudolphi, 1819)	*Ibis falcinellus*	Europe
	Ibis sp.	Africa
	Plegadis sp.	Africa
	Platalea sp.	Africa
	Theristicus sp.	Africa
P. brygooi Richard, 1964	*Lophotibis cristata*	Madagascar
P. chandrapuri Srivastava, 1952	*Threskiornis melanocephalus*	India
P. consimilis Dietz, 1909	*Geronticus albicollis*	Brazil
	Molybdophanes coerulescens	Brazil
P. fraternus Johnston, 1917	*Herodias timoriensis*	Australia
P. parvispinosus Yamaguti, 1933	*Podiceps ruficollis*	Japan
P. sarai Saksena, 1957	*Threskiornis melanocephalus*	India
P. simarai Nigam, 1944	*Platalea leucorodia major*	India
P. skrjabini Hilmy, 1949	*Plegadis falcinellus*	Egypt
P. srivastavai Peter, 1954	pigeon*	India
P. vioscai Lumsden, 1962	*Eudocimus albus*	U.S.A.
P. wesleyi Verma, 1936	*Ibis* sp.	India
	Numenius sp.	India
	Pseudoibis papillosa	India

* No scientific name has been provided.

Table 2 Comparison of measurement of *P. toki* and related species

	Present species	*P. acuminatus**	*P. parvispinosus*†	*P. vioscai*‡
Body length (mm)	9.0–10.4	7.7–10.5	8.7–14.4	8.567
Body width (mm)	1.9–2.6	1.01–1.56	1.2–2.0	1.699
Head collar (mm)	1.3–1.5	–§	–	1.557
No. of spine (each side)				
Marginal	21–23	25	21–22	23–25
Corner	3	3	4	3
Oral sucker (mm)	0.28–0.30×0.25–0.30	0.194–0.290×0.116–0.232	0.28×0.33	0.142×0.496
Pharynx (mm)	0.30–0.40×0.18–0.23	0.2–0.3×0.1–0.2	0.25×0.21	0.24×0.23
Esophagus (mm)	0.28–0.48	–	0.38	0.496
Cirrus pouch (mm)	0.40×0.50	–	0.40×0.58	0.512
Acetabulum (mm)	1.50–1.78×1.05–1.23	0.97–1.55×0.77–1.21	1.38×1.18	1.451×1.522
Sucker ratio	1 : 6	1 : 5	1 : 4	1 : 7
Testis (mm)				
Anterior	0.55–0.80×0.28–0.38	0.815×0.582	1.16×0.65	0.602×0.333
Posterior	0.70–0.90×0.28–0.34	0.873×0.524	1.27×0.65	0.708×0.333
Ovary (mm)	0.30×0.17–0.30	–	0.58×0.46	0.486×0.409
Egg (mm)	0.094×0.049	0.107×0.048	0.100×0.058	0.084×0.050

* Johnston (1917), † Yamaguti (1933), ‡ Lumsden (1962), § Not measured.

of *P. vioscai* is partly overlapped with it of *P. toki*, but the present species can be distinguished by the apparent smaller size of oral sucker (Table 2). In addition, the cirrus pouch of *P. vioscai* is situated at the median line. The marginal spines are also different in size. The new species also differs from *P. parvispinosus* Yamaguti, 1933 which is only the species described in Japan from the dabchick, *Podiceps ruficollis*, by the following points: the number of corner spines, body width, sucker ratio, and the sizes of pharynx, testis and ovary (Table 2). When the original figures of these species are compared with the present species, the shapes of head collars of *P. acuminatus* and *P. parvispinosus* are also different.

From the facts mentioned above, the present species have apparent morphological differences from any known species. In addition, the geographical distribution of the host is extremely limited to the narrow region, such as Japan and its surrounding area. Therefore, the present species is concluded as a new species.

Type host: *Nipponia nippon*.

Habitat: Small intestine.

Type locality: Sado, Japan.

Type series: The holotype and two paratypes are kept at Department of Parasitology, Nippon Veterinary and Zootechnical College, Tokyo.

Acknowledgments

The authors thank to Dr. Reiji Takahashi, of the Department of Veterinary Pathology, Faculty of Agriculture, University of Tokyo, for supplying the specimens.

References

1) Dietz, E. (1909): Die Echinostomiden der Vogel. Zool. Anz., 34, 180–192.
2) Hilmy, I. S. (1949): *Patagifer skrjabini* n. sp. from the glossy ibis, *Plegadis falcinellus falcinellus*. Proc. Egypt Acad. Sci., 4, 20–23.
3) Jain, S. P. (1967): Redescription of *Patagifer wesleyi* Verma. Indian J. Helminthol., 19, 70–76.
4) Johnston, S. J. (1917): On the trematodes of Australian birds. J. R. Soc. New South Wales, 50, 187–261.
5) Lumsden, R. D. (1962): Four echinostome trematodes from Louisiana birds including the

description of a new species. Tulane Stud. Zool., 9, 301–308.
6) Peter, C. T. (1954): A note on the life cycle of *Patagifer srivastavai* n. sp. raised experimentally. Proc. Indian Acad. Sci., 41, 221.
7) Richard, J. (1964): Trematodes d'oiseaux de Madagascar. Note 3. Espéce de la famille Echinostomatidae Poche, 1926. Ann. Parasitol. Hum. Comp., 39, 607–620.
8) Skrjabin, K. I. (1964): Key to the Trematodes of Animals and Man, Univ. Illinois Press, Urbana, 351p.
9) Tanaka, K. and Nagatani, T. (1980): Atlas of Scanning Electron Microscopy (Zusetsu Sohsa-Denshi-Kenbikyo), Asakura Shoten, Tokyo, 282p, (In Japanese).
10) Verma, S. C. (1936): Notes on trematode parasites of Indian birds. Allahabad Univ. Stud., 12, 147–188.
11) Yamaguti, S. (1933): Studies on the helminth fauna of Japan. Jpn. J. Zool., 5, 1–134.

日本産トキ *Nipponia nippon* より得られた新吸虫 *Patagifer toki* sp.n. について

恩田千景　今井壮一　石井俊雄
（日本獣医畜産大学寄生虫学教室）

新潟県佐渡で捕獲後斃死したトキ1個体から得られた棘口吸虫科の新種 *Patagifer toki* を記載した．体は円筒形で，体長 9.0～10.4 mm，体幅 1.9～2.6 mm．頭冠は良く発達し 1.3～1.5 mm で背側中央から2葉に分かれている．周縁には 21～23 本の先端の鈍な楔状の棘が一列に並んでおり，腹側角には周縁の棘とは別に3本の棘がやや内側に向いて生じている．口吸盤は頭冠の前端部中央にあり大きさは 292×267 μm で，それに続く咽頭は縦に長い楕円形を呈し，大きさは 350×200 μm である．腹吸盤は大きく，1.59×1.12 mm で頭冠のすぐ後位にあり，その左前方に重なって，大きさ 400～500 μm の cirrus pouch が認められる．精巣は細長い不正楕円形で体の後方正中に，2個縦列している．卵巣は体中央部やや前方に位置する．本種は *P. acuminatus* および *P. vioscai* に似るが，前者とは頭冠の形と周縁の棘の数が異なり，後者とは sucker ratio と cirrus pouch の位置が異なる．また，本邦からはカイツブリより *P. parvispinosus* が記載されているが，頭冠の形と腹側角の棘の数，咽頭，精巣，卵巣の大きさが異なる．