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HYMENOLEPIDOID CESTODES (CYCLOPHYLLIDAE, HYMENOLEPIDOIDAE) OF PRATINCOLE (*GLAREOLA PRATINCOLA*) FROM THE SOUTH OF UKRAINE

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Hymenolepidoid Cestodes (Cyclophyllidae, Hymenolepidoidae) of Pratincole (*Glareola pratincola*) from the South of Ukraine. Kornyushin V. V., Greben O. B. — Four hymenolepidoid cestode species *Glareolepis porale* (Meggitt, 1927) Spassky, 1967; *Wardium* (s. l.) *tauricum* Kornyushin et Greben, sp. n.; *Wardium* (s. l.) sp. n.; and *Echinocotyloides longirostris* (Rudolphi, 1819) Kornyushin, 1983 from pratincole from the Southern Ukraine are discribed. The morphology of *G. porale* is described in details. An interesting new observation is that testes are lacking in female proglottides of *G. porale*; the structures described in literature as testes in hermaphroditic proglottides are, in fact, ovarian lobes. The new cestode species *Wardium* (s. l.) *tauricum* sp. n. is described. It is characterised by aploparaksoid hooks, 13–15 μm long, and conical armed cirrus, 20–22 μm long. Another cestode species, *Wardium* (s. l.) sp., is identified to the generic level only. It differs from all the species of the genus in the size and armament of the cirrus; however, no scolex was present in the material studied.

Key words: *Glareola pratincola*, *Glareolepis porale*, *Wardium* (s. l.) *tauricum* sp. n, *Echinocotyloides longirostris*, Ukraine.

Гименолепидоидные цестоды (Cyclophyllidae, Hymenolepidoidae) луговой тиркушки (*Glareola pratincola*) юга Украины. Корнюшин В. В., Гребень О. Б. — Приведены описания 4 видов гименолепидоидных цестод от луговой тиркушки юга Украины: *Glareolepis poralae* (Meggitt, 1927) Spassky, 1967; *Wardium* (s. l.) *tauricum* Kornyushin et Greben, sp. n.; *Wardium* (s. l.) sp.; *Echinocotyloides longirostris* (Rudolphi, 1819) Kornyushin, 1983. Детально описана морфология *G. poralae*. Установлено, что в гермафродитных члениках у *G. poralae* семенники отсутствуют, а структуры, описанные в литературе как семенники в гермафродитных члениках — это лопасти яичника. Описан новый вид цестод *Wardium* (s. l.) *tauricum* sp. n. с аплопараксоидными крючьями 13–15 мкм длиной и конусовидным вооруженным циррусом 20–22 мкм длиной. Еще один вид цестод *Wardium* (s. l.) sp. из-за отсутствия сколекса определен только до рода. Он отличается от всех известных видов этого рода размерами и вооружением цирруса.

Ключевые слова: *Glareola pratincola*, *Glareolepis poralae*, *Wardium* (s. l.) *tauricum* sp. n, *Echinocotyloides longirostris*, Украина.

Introduction

In Ukraine, 14 helminth species have been recorded from *Glareola pratincola* L. Four of them are cyclophillidean cestodes, i. e. *Dictymetra nymphaea* (Schrank, 1790) Spasskaja et Spassky, 1977 (family Dilepididae Railliet et Henry, 1909); *Glareolepis porale* (Meggitt, 1927) Spassky, 1967; *Wardium himantopodis* (Krabbe, 1869) Spassky et Spasskaja, 1954 (family Aploparaksidae Mayhew, 1925) and *Echinocotyloides longirostris* (Rudolphi, 1819) Kornyushin, 1983 (family Echinocotylidae Ariola, 1899) (Smogorzhevskaya et al., 1988). The latter three species are cestodes of the superfamily Hymenolepidoidea, with only *G. porale* considered as a specific pratincole parasite. During the revision of cestode specimens from pratincole stored in the helminthological collection of the Institute of Zoology, National Academy of Sciences of Ukraine, two previously recorded species, *G. porale* and *E. longirostris*, were redescribed. The specimens previously identified as *W. himantopodis* (see Smogorzhevskaya et al., 1988) were found to belong to the new species *Wardium* (s. l.) *tauricum* sp. n. Furthermore, the material contained strobilar fragments of another cestode

species, which morphologically may be attributed to the genus *Wardium* (s. l.) but does not correspond to the description of any known species in this group. In the absence of scolex, we refrain from describing a new species and mention it herein as *Wardium* (s. l.) sp.

In this paper, we adopt the broad concept for the genus *Wardium* Mayhew, 1925 as proposed by Bondarenko and Kontrimavichus (2006). However, we believe that further studies are needed due to the heterogeneous character of *Wardium* (s. l.) In our opinion, *Wardium porale* significantly differs from all the other species in this group and this is a reliable basis for validation of the genus *Glareolepis* Spassky, 1967. Its amended generic diagnosis is also given below.

Cestodes from pratincole deposited in the collection of the Department of Parasitology of the Institute of Zoology, Kyiv, were used for the present study. In general, the collection included material from 16 birds examined in 1964–1965 at Potiivka Plot of the Black Sea National Biosphere Reserve and in 1967–1969 on Bokal Spit in Crimea. Worms were stained with hematoxylin, lactocarmine, iron acetocarmine and embedded in Canada balsam. To study scolex armament and cirrus armament, cestodes were cleared in Berlese's medium.

All measurements in the descriptions are given in micrometres unless otherwise indicated.

Below we give the descriptions of the cestode species studied.

Superfamily HYMENOLEPIDOIDEA

Family APLOPARAKSIDAE

Glareolepis porale (Meggitt, 1927) Spassky, 1967

Syn.: *Hymenolepis porale* Meggitt, 1927; *Sphenacanthus porale* (Meggitt, 1927) Lopez-Neyra, 1942; *Hymenolepis* (*H.*) *porale* (Meggitt, 1927) Deblock, 1964; *Wardium porale* (Meggitt, 1927) Gvozdev, 1964; *Dicranotaenia porale* (Meggitt, 1927) Schmidt, 1986.

Host. *Glareola pratincola* L.

Prevalence. In 4 out of 16 examined birds, i. e. 25%.

Intensity of infection. 1–7 specimens.

Locality. Potiivka Plot of the Black Sea National Biosphere Reserve (Kherson Oblast), Bokal Spit of Karkinytsky Bay (Crimea).

Morphology (fig. 1, 2). Length of cestodes with uterine segments up to 168 mm, maximum width up to 4 mm. Scolex oval, slightly flattened dorso-ventrally, 220–360 in diameter. Suckers rounded, 90–120 in diameter. Rostellum oval or mushroom-shaped, 70–115 long and 55–90 in maximum diameter, armed with 10 hooks close to aploparaksoid in shape. Hooks 23–25 long, with base 18 long; handle 3.0–3.8 long; blade 13–15 long. Guard flattened in plane of proboscis surface, its length 10. Rostellar pouch sac-like, with weak muscles, 160–190 x 80–100 in size.

Scolex not always clearly separated from strobila. Neck 150–260 wide. Both external and internal strobilation beginning just posterior to neck. Numerous longitudinal muscular bundles present. Genital pores unilateral. Longitudinal excretory canals connected by transverse anastomoses. Male and female genital glands transposed porally in relation to longitudinal axis of proglottis.

Strobilar development characterised by well-expressed protandry. Primordia of testes appear in 55th–56th segments (680 wide); mature testes distinct in 112th–113th segments (1100 wide); testes disappear in 239th–244th segments (1610 wide). Primordium of cirrus sac appears in 102nd–104th segments (1030 wide). In 134th segment (1270 wide), cirrus sac completely formed. Posterior to "male" part of strobila, a group of segments containing non-developed gonads (approximately segments 240th–280th) present. Female genital primordia appear in 240th–244th segments. In 282nd–285th proglottides (2200 wide), fully formed ovary and vitellarium present. Uterus distinct from 376th–378th segments (2760 wide). Ripe eggs present in 522nd–526th segments (reaching up to 3860 in width). Along the poral edge of proglottides with female primordia, female proglottides and uterine proglottides, distinct glandular fields present.

In the proglottids nearest to scolex, three testes formed and become mature. Testes rounded (oval in some slides stained in lactocarmine), 35–125 in diameter, situated in

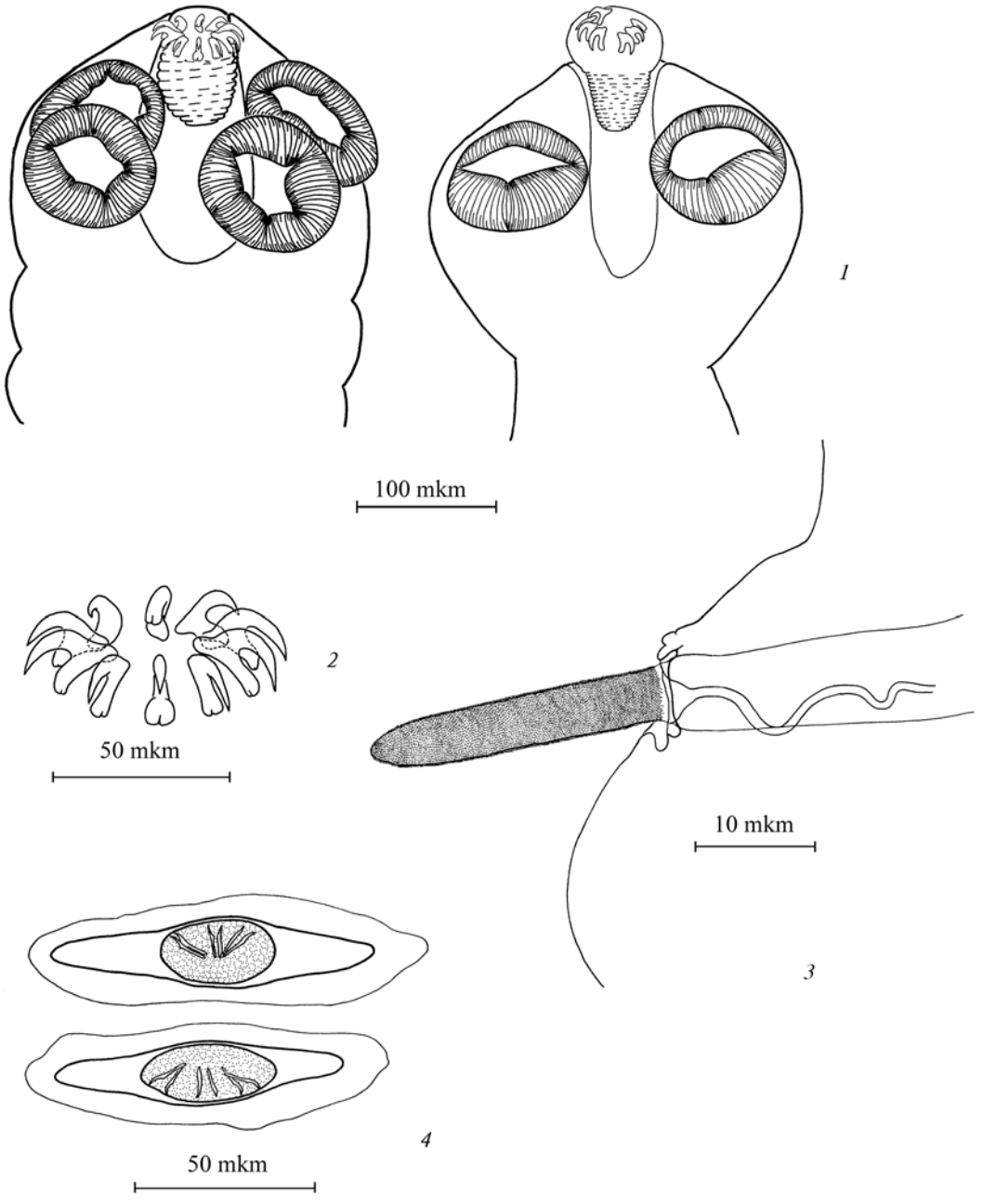

Fig. 1. *Glareolepis porale*: *1*— scolices; *2* — rostellar hooks; *3* — cirrus and vagina; *4* — eggs. Scale bars: *1* — 100 μm; *2, 4* — 50 μm; 3 — 10 μm.

Рис. 1. *Glareolepis porale*: *1* — сколексы; *2* — хоботковые крючья; *3* — циррус и вагина; *4* — яйца. Масштабные линейки: *1* — 100 мкм; *2, 4* — 50 мкм; *3* — 10 мкм.

obtuse triangle, sometimes in row occupying poral part of median field of segment. Genital atrium at lateral margin of segment, forming spherical cavity with diameter of 40–45. At this stage, orifice of cirrus sac distinct, terminating into closed cavity. Later on (130th–136th segments), with partial evagination of cirrus, atrial cavity opens outwards. In proglottids with evaginated cirrus, atrial wall often forming ring-shaped fold

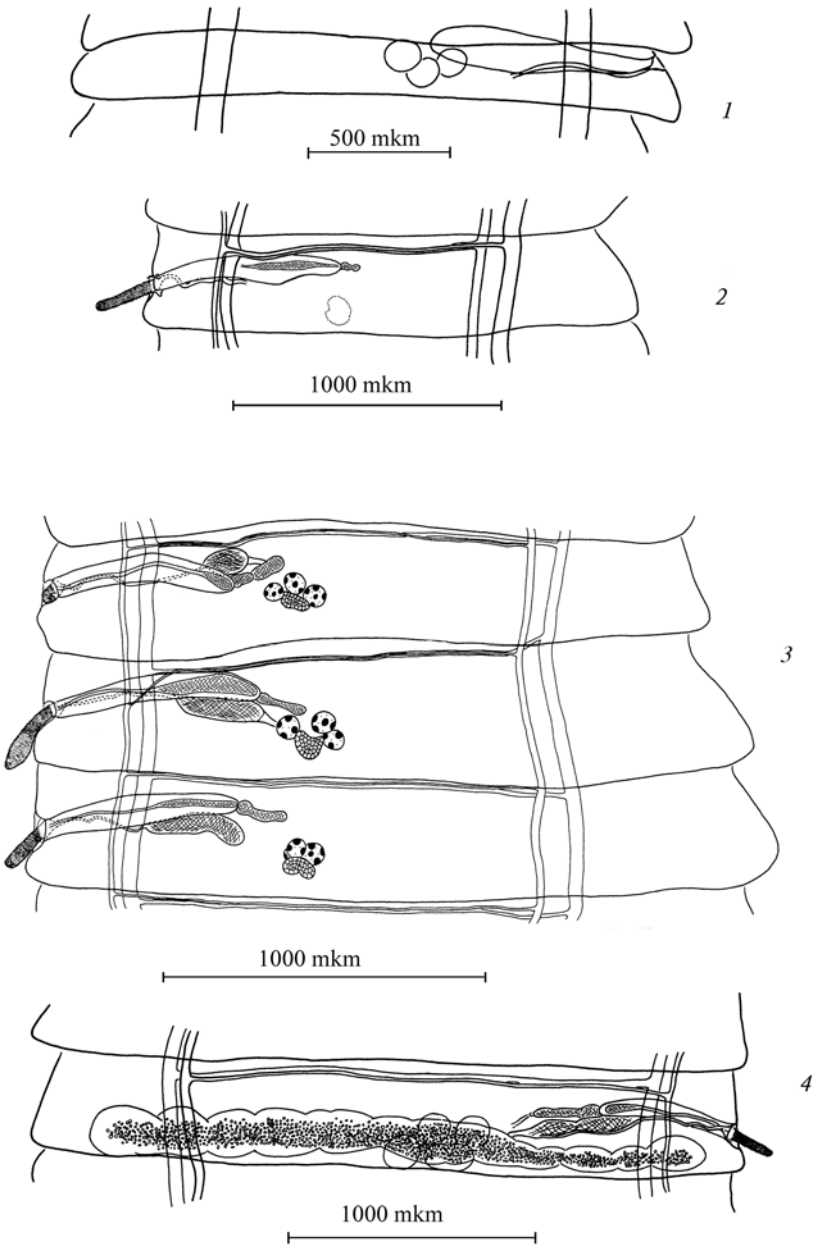

Fig. 2. *Glareolepis porale*: *1* — male proglottid; *2* — proglottid with female primordium; *3* — proglottid with female gonade only; *4* — female proglottid. Scale bars: *1* — 500 μm; *2–4* — 1000 μm.

Рис. 2. *Glareolepis porale*: *1* — мужской членик; *2* — членик с женским зачатком; *3* — женский членик; *4* — маточный членик. Масштабные линейки: *1* — 500 мкм; *2–4* — 1000 мкм.

resembling finger-like "processes" in front of and behind the base of cirrus, as described by previous authors (Deblock, 1964; Maksimova, 1989).

Cirrus sac and external seminal vesicle formed later that testes. Cirrus sac cigar-shaped, with dense muscular wall, relatively narrow, elongate. Normally, cirrus sac straight, sometimes it can bend. Length of cirrus sac 500–720, its diameter 60–100; not reaching middle of segment. Internal seminal vesicle with variable shape, can occupy up to ? of cirrus sac. External seminal vesicle oval or pear-shaped, 150–300 x 60–160 in size, overlapping antiporal part of cirrus sac. In proglottides with female primordia,

external seminal vesicle situated aporally to cirrus sac or wrapping dorsally to it. In the proglottids with female gonads, external seminal vesicle has often irregular shape. Cirrus cylindrical, slightly tapering towards its distal end, densely covered with small spines. Length of fully-evaginated cirrus 280—300, its diameter 30—40, up to 50 at basal part. Distal extremity of fully-evaginated cirrus conical.

Primordia of female gonads initially distinct in proglottides with developed testes as rounded granular masses, 80—100 in diameter, from which three-lobed ovary (rarely with more lobes) and irregular vitellarium are further formed. Female gonads situated closely to poral excretory vessels and not reaching aporal half of median field. In proglottides with formed female gonads, testes are absent. Maximum width of ovary 580, vitellarium 200 wide. Copulative part of vagina funnel-shaped, 60—70 in diameter and 30—40 in length, passing into narrow tube (5 in diameter) situated posterior to cirrus sac. Conductive portion of vagina may form arbitrary curves. Seminal receptacle oval or elongate in some proglottides, 85—400 x 40—100 μm, situated posteriorly to cirrus sac or may overlap it.

Uterus starting its development as transverse strand in place of female gonads. With filling with eggs and their maturation, uterus growing in width and becoming saccular, entering lateral fields between ventral and dorsal osmoregulatory canals, thus filling entire proglottis. Eggs fusiform, 100—110 x 20—25 in size. Hexacanth oval, 40—50 x 18—20. Embryonic hooks 10—13 long.

Remarks. This specific pratincole parasite was described as *Hymenolepis porale* on the basis of strobilar fragments (without scoleces) from North-West Africa (Meggitt, 1927). The author gave a short description indicating the poral displacement of gonads and the presence of 3 testes; that allowed placing this species within the genus *Hymenolepis*. Deblock (1964) proposed a detailed description of the type material and noted the presence of glandular complex consisting of four parts in the genital atrium. Gvozdev (1964) also gave a detailed redescription of this species on the basis of new materials; he found out the presence of 10 aploparaksoid rostellar hooks and placed this species into the genus *Wardium*. In his description, Gvozdev (1964) mentioned the poral displacement of the gonads but gave no record of 4-lobed glandular complex in the atrium. Spassky (1967) erected the monotypic genus *Glareolepis* for *W. porale*; the presence of glandular complex in the atrium and the poral displacement of gonads were considered as differentiating characters (Spassky, 1967). Maksimova (1989) accepted the validity of the genus *Glareolepis* and presented a detailed description based on specimens collected from pratincoles from southern Kazakhstan, indicating the presence of an atrial body of sclerotic structure (Maksimova, 1989). Kornyushin (1993) also recognised *Glareolepis* as a valid genus (Kornyushin, 1993).

S. K. Bondarenko and V. L. Kontrimavichus (2006), in their monograph on the cestode family Aploparaksidae, considered the genus *Glareolepis* as a synonym of *Wardium*. In their opinion, the special atrial structure is actually only folds of the large genital atrium and the poral displacement of gonads is not sufficient to justify the erection of a distinct genus.

Analysing the description and illustrations of this species in the papers of previous authors (Deblock, 1964; Gvozdev, 1964; Maksimova, 1989), we believe that they contain misinterpretations relative to the presence of testes in female proglottides. Their drawings show hermaphrodite segments with testes in front of female gonads. In our opinion, the structures interpreted as testes by the above-mentioned authors are the three lobes of the ovary; the aggregation of the "female glands" in their concept is actually the irregular vitellarium. According to our observations, testes are present in male segments only and disappear before the differentiation of the female primordum into ovary and vitellarium. This feature, along with the poral location of both male and female gonads, the peculiar shape of the ovary (the presence of 3 lobes fairly well sep-

arated from each other), the peculiar structure of the cirrus sac, cirrus and atrium as well as the spindle-shaped eggs seem to be sufficient to justify the validation of the genus *Glareolepis*.

We would like to specify only that more research is desirable to study the life cycles, because the genus *Wardium* (s. l.) has other species with pronounced protandry.

Diagnosis of the genus *Glareolepis* Spassky, 1967: Massive strobila consisting of transversely-elongate proglottides. Scolex relatively small, oval, sometimes round, slightly flattened dorso-ventrally. Suckers transversely oval, muscular. Rostellum armed with 10 hooks with shape similar to aploparaksoid. The hook guard bifurcated and flattened in the plane of rostellum. Strobila expanding immediately after scolex, its anterior portion wedge-shaped. Well-expressed protandry in strobilar development. Three testes formed, maturate and disappear before ovary and vitellarium start their differentiation. Female primordia oval in proglottides with mature testes. Intermediate part of strobila characterised by the lack of testes and the presence of undifferentiated female primordia only. Genital atrium simple, shallow. In poral margin of segment, glandular field present, situated anterior and posterior to genital atrium. Gonads occupying poral part of median field of segment; aporal testis and female gonads not extending in antiporal direction beyond median line of proglottis. Ovary with three (rarely more) clearly distinct spherical lobes. Uterus saccular, extending across segment, forming shallow sacculations, entering lateral fields. Eggs fusiform, hexacanth oval or lemon-shaped. Type and only species: *Glareolepis porale* (Meggitt, 1927) Spassky, 1967.

Wardium* (s. l.) *tauricum Kornyushin et Greben, **sp. n.**

Type host. *Glareola pratincola* L.

Type locality. Crimea, Bokal Spit, Karkinytsky Bay (45°77' N; 33°17' E).

Type material. Holotype, CH 32.1, slide no. 651–12, 06/06/1969. Paratypes: CP 32.1–32.3, slides nos. 651–12 b-d (3 specimens); CP 32.4, slides nos. 81–1 e, 11/07/1967 (1 specimen); CP 34.5–34.10, slides nos. 85–2 f-g, 11/07/1967 (2 specimens), no. 87–3 h-m, 11/07/1967 (6 specimens).

Prevalence. in 4 out of 16 birds examined, i. e. 25%.

Intensity of infection. 1–7 specimens.

Etymology. The species name reflects the type locality of the new species (Crimean Peninsula).

Description (fig. 3–5; measurements of paratypes given in parentheses). Total length of cestode terminating with segments with testes about 4 mm, length of specimens with uterine segments up to 32 mm. Maximum width 3.5 mm (paratype). Strobila ribbon-like, gracile, with weak muscles. Diameter of conical scolex at level of suckers 130 (120–160). Suckers oval, cup-shaped, 55–65 x 45–48 (55–85 x 55–63). Length of proboscis depends on evagination rate, 123 (93–123). Rostellum small, 41 (26–40) long and 30 (25–35) in diameter at level of hooks. Holotype with 9 aploparaksoid hooks (one hook lost, remaining specimens possessing 10 hooks). Length of hooks 13–15, length of base 10 (10–11), handle 4 (2–4) long, guard 8 (8–10) long, blade 10 (8–10) long. Rostellum pouch sac-like, normally flask shape, 110 x 43 (60–90 x 38–45), extending beyond posterior margin of suckers. Scolex clearly outlined from neck. Neck up to 48 (45–85) wide. Internal and external segmentation begin simultaneously at 550 (240–520) from scolex. Excretory canals narrow; transverse anastomoses 5 in diameter, distinct in some proglottides only. Genital pores unilateral. Strobilar development protandrous.

Testes three, rounded, 10–23 (13–20) in diameter, arranged in transverse row; present in young proglottides only, starting from the 182nd–183rd proglottides (140 wide) till 240th–244th (160 wide). Starting from the 72nd (70–145) proglottis, cirrus

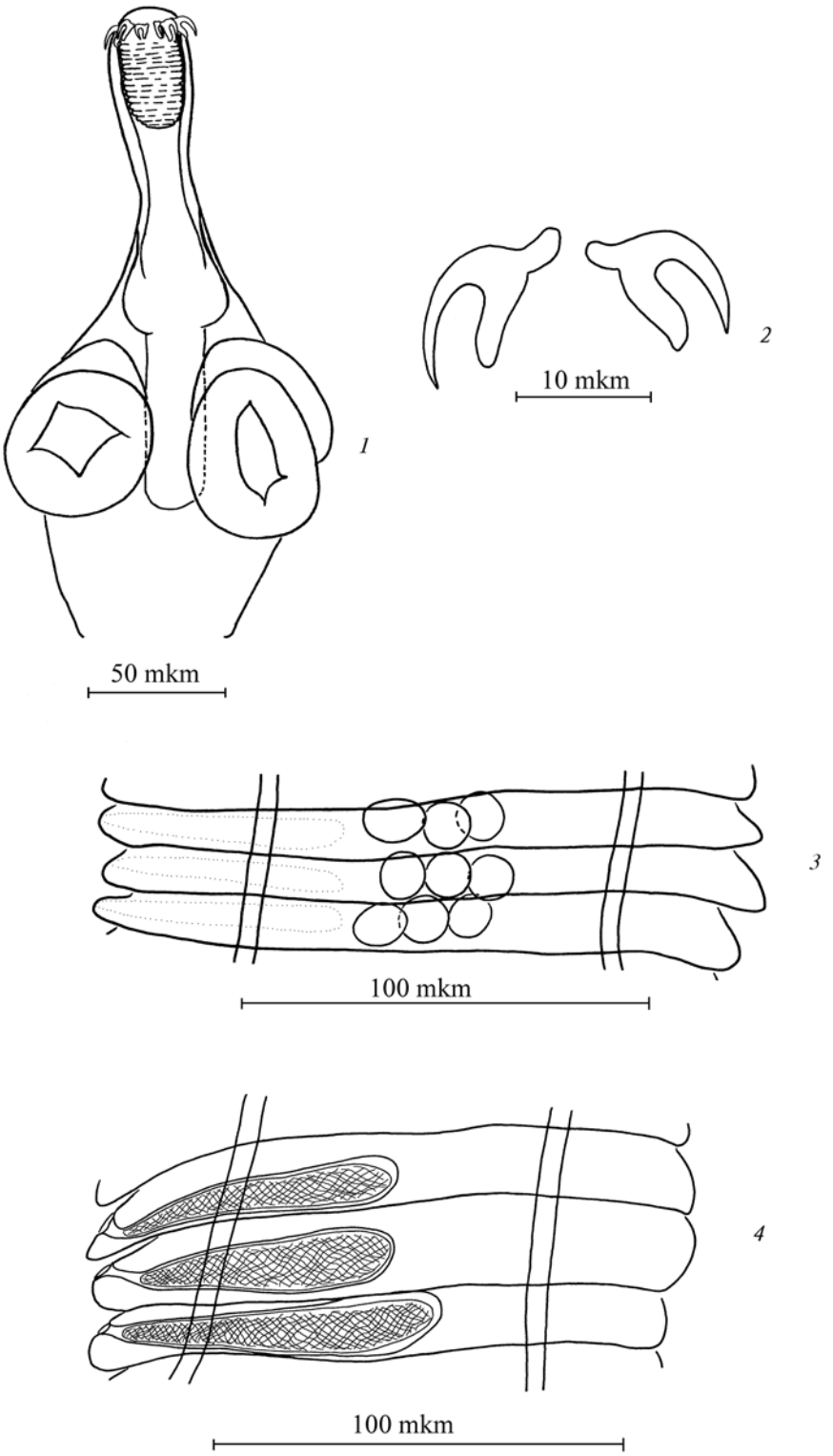

Fig. 3. *Wardium* (s. l.) *tauricum* sp. n., holotype: *1* — scolex; *2* — rostellar hooks; *3* — male proglottids; *4* — proglottids with cirrus-sac only. Scale bars: *1* — 50 μm; *2* — 10 μm; *3*, *4* — 100 μm.

Рис. 3. *Wardium* (s. l.) *tauricum* sp. n., голотип: *1* — сколекс; *2* — хоботковые крючья; *3* — мужские членики; *4* — членики с бурсой цирруса. Масштабные линейки: *1* — 50 мкм; *2* — 10 мкм; *3, 4* — 100 мкм.

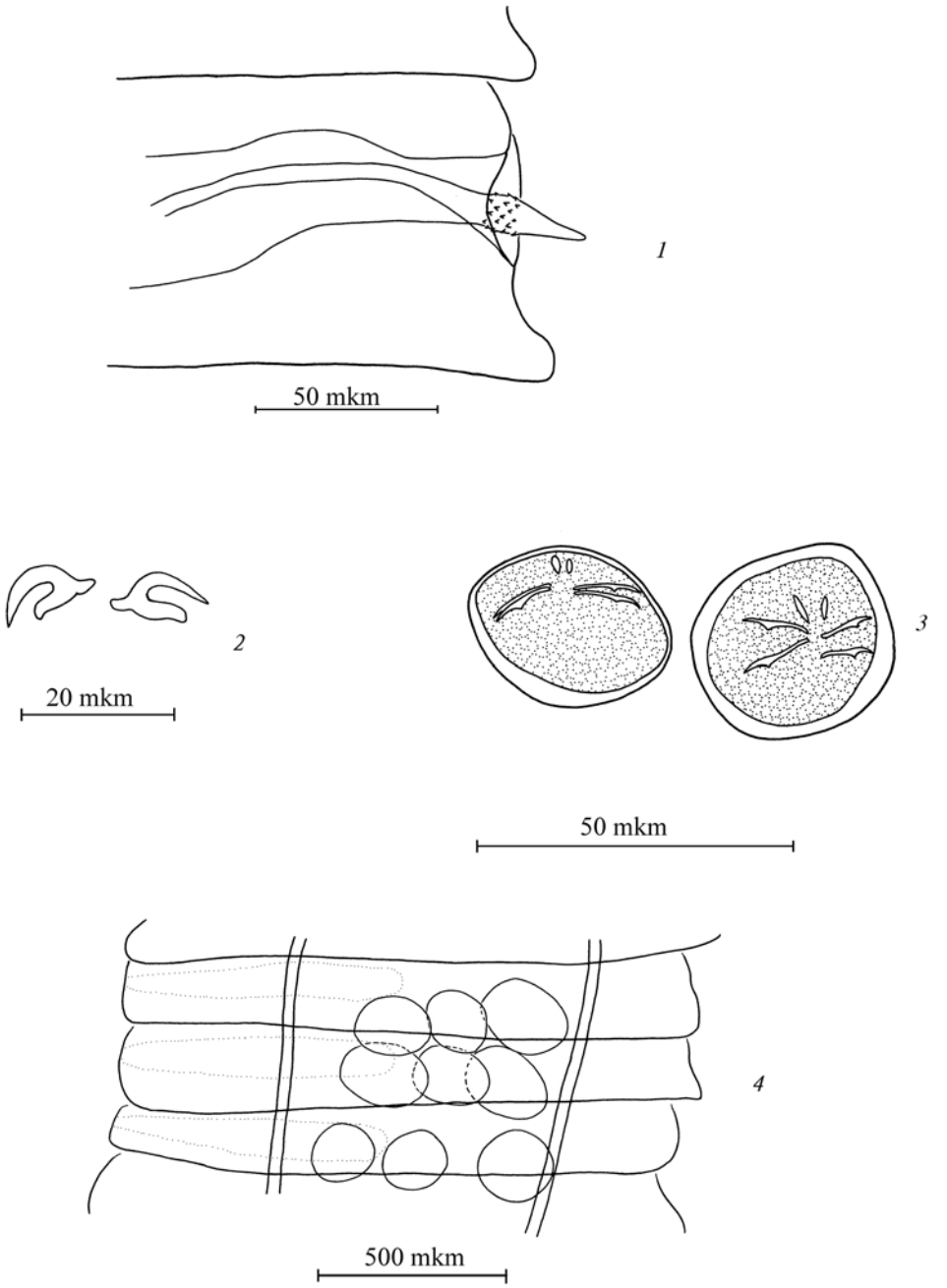

Fig. 4. *Wardium* (s. l.) *tauricum* sp. n. Paratype: *1* — cirrus and vagina; *2* — rostellar hooks; *3* — eggs; *4* — male proglottids. Scale bars: *1*, *3*, *4* — 50 μm; 2 — 20 μm.

Рис. 4. *Wardium* (s. l.) *tauricum* sp. n. паратип: *1* — циррус и вагина; *2* — крючья; *3* — яйца; *4* — мужские членики. Масштабные линейки: *1, 3, 4* — 50 мкм; *2* — 20 мкм.

sac, external seminal vesicle and (sometimes) seminal receptacle are distinct. With development of cirrus sac and seminal vesicle, testes gradually shift to aporal canals and then disappear totally. Cirrus sac long and narrow, crossing midline and sometimes reaching aporal osmoregulatory canals in young proglottides. With further development of proglottides, cirrus sac becoming relatively shorter, reaching only midline in proglottides with developing uterus, not reaching midline or even not crossing poral osmoreg-

ulatory canals. Cirrus sac 68–88□15–18 (88–120□13–18). Almost entire cirrus sac occupied by internal seminal vesicle with size 63–68□15–18 (52–85 x 10–45). External seminal vesicle round or oval, 30 x 25 (30–70 x 22–50), formed together with cirrus sac and situated at its antiporal end; in young proglottides, external seminal vesi-

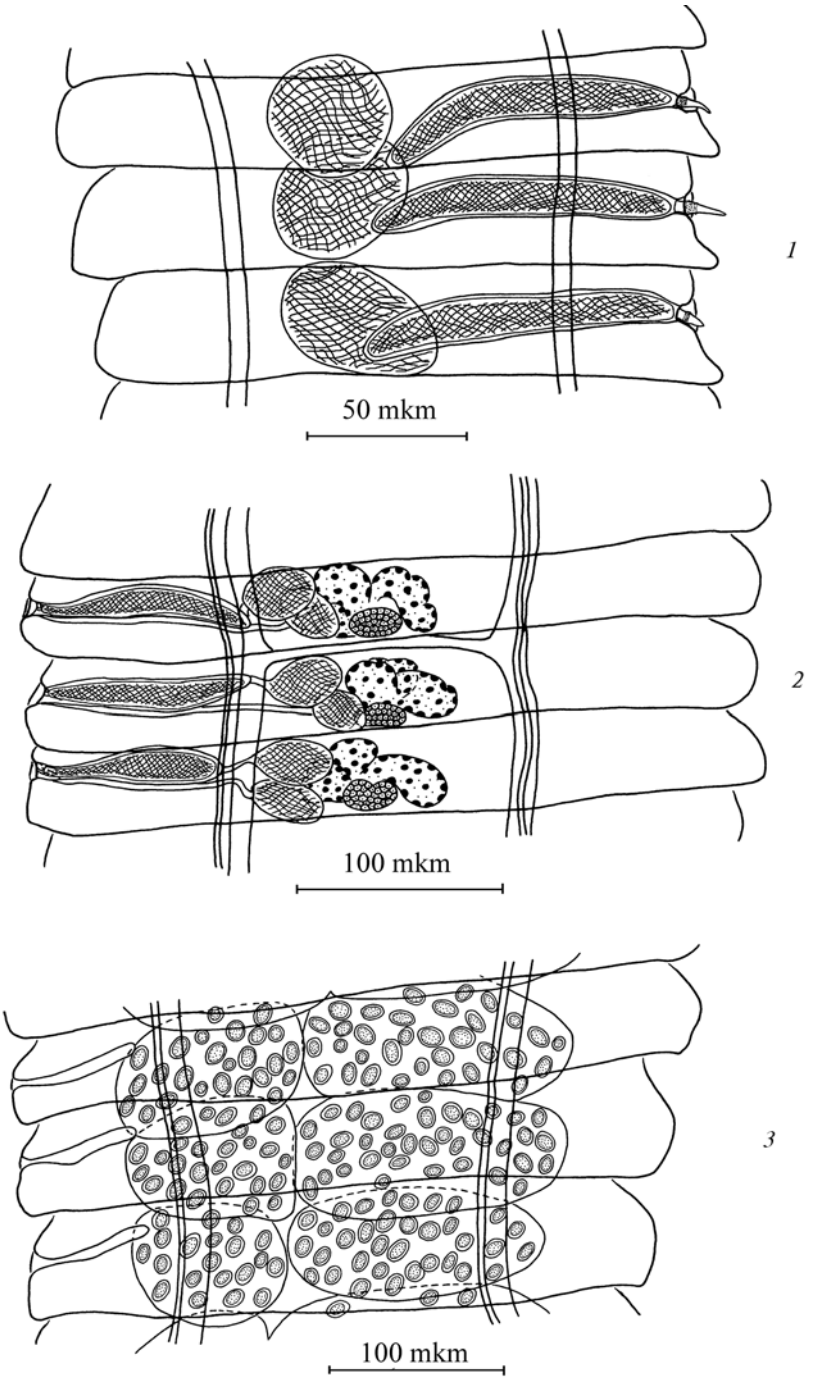

Fig. 5. *Wardium* (s. l.) *tauricum* sp. n. Paratype: *1* — proglottids with cirrus-sac only; *2* — proglottids with female gonade only; *3* — female proglottids. Scale bars: *1* — 500 μm; *2*, *3* — 100 μm.

Рис. 5. *Wardium* (s. l.) *tauricum* sp. n. паратип: *1* — членики с бурсой цирруса; *2* — женские членики; *3* — маточные членики. Масштабные линейки: *1* — 500 мкм; *2*, *3* — 100 мкм.

cle adjacent to aporal canals; with further development, external seminal vesicle shifting in poral direction and situated at antiporal portion of cirrus sac. Cirrus minute, up to 20–22 long, conical (incompletely evaginated), covered with small spines situated in diagonal rows, with 5–6 spines per row. Diameter of cirrus base about 4 μm; base followed by unarmed portion, 5 long, and then by armed part, 6 in diameter and 5–6 long. Distal part of cirrus 10–11 long, conically narrowing to 2 at distal end. When cirrus invaginated, spines not clearly seen. Genital atrium simple, funnel-shaped or tubular, 9–10 deep.

Female genital glands starting their development as round primordium in middle of proglottis in segments with developed cirrus sac and external seminal vesicle, i. e. in 692nd–694th segments (215 wide). Small intermediate portion of strobila consisting of segments without developed gonads. In proglottides with width 410–430, ovary and vitellarium fully formed. Ovary is lobed, with 3–5 distinct lobes, with maximum width 200. Vitellarium oval, 20–55 x 15–22, situated posteriorly to ovary, sometimes slightly displaced aporally. Vagina as thin-walled tube with diameter 3–4, situated posteriorly to cirrus sac. Seminal receptacle oval, measuring 35–55 x 20–30, formed simultaneously with cirrus sac and external seminal vesicle, prior to appearance of primordia of female reproductive glands.

Saccular uterus formed on place of vitellarium, ovary and seminal receptacle; with maturation of eggs, uterus growing across segment and extending beyond excretory canals. In whole-mounted individuals, ripe eggs oval, measuring 33–38 x 25–30. Embryonic hooks 13–15 long. Embryophore smooth.

Differential diagnosis. By the length of rostellar hooks, the new species resembles several species parasitic in charadriiform hosts: *Wardium cervotestis* (Ahern et Schmidt, 1976) Bondarenko, 1999 (hook length 16), *Wardium collariella* (Coil, 1956) Bondarenko et Kontrimavichus, 2006 (hook length 15–16 μm), *Wardium paraclavicirrus* Oschmarin, 1963 (hook length 16), *Wardium recurvirostrae* (Krabbe, 1869) Spassky et Spasskaja, 1954 (hook length 14–15) and *Wardium tinamoui* (Olsen, 1970) Bondarenko et Kontrimavichus, 2006 (hook length 16.6). In *W. cervotestis*, the cirrus sac and the cirrus are similar in length but the spindle-shaped cirrus and the nature of its armament as well as the orientation of oncosphere along the major axis of the embryophore distinguish this species from that described herein. From the other above-mentioned species, *Wardium* (s. l.) *tauricum* sp. n. differs in length, shape and armament of cirrus, cirrus-sac size (in all these species, cirrus sac is much larger than that in the present species) and the shape of the ovary (transversely elongated in the other species).

Moreover, the handle of the rostellar hooks in *Wardium* (s. l.) *tauricum* sp. n. is longer than that in *W. cervotestis* and *W. paraclavicirrus* whereas it is not expressed in *W. collariella* and *W. tinamoui*. Hook shape in *W. recurvirostrae* is the closest one to the hooks of the present species but cestodes have a larger strobila and a different shape and size of the cirrus.

This species was previously identified as *Wardium himantopodis* (Krabbe, 1869) Spassky et Spasskaja, 1954 (Smogorzhevskaya et al, 1988). However, the revision of this material showed that *Wardium* (s. l.) *tauricum* sp. n. is clearly differentiated from *W. himantopodis* in the size of rostellar hooks, which is shorter than 8–10 in the latter, the size of the cirrus sac, which is larger in *W. himantopodis*, and the length of cirrus. The cirrus of *W. himantopodis* is 35–40 x 6–10.

In addition, it should be mentioned that none of the species of the genus *Wardium* has been registered in pratincoles till now.

***Wardium* (s. l.) sp.**

In one pratincole collected on Bokal Spit, along with *Wardium* (s. l.) *tauricum* sp. n., fragments of another cestode species were found. Their identification to the species

level was impossible. The structure of proglottides, i. e. the presence of 3 testes, unilateral genital pores, details of formation of gonads, cirrus shape and armament, allows us to place these cestodes tentatively to the genus *Wardium* (s. l.). However, these fragments of cestodes cannot be attributed to any of the known species of this genus. The absence of a scolex render impossible the description of a new species.

Morphology (fig. 6). Length of immature specimen without scolex about 30 mm, maximum width of segments with female gonads 0.58 mm. Genital pores unilateral, open in mid-lateral margin of segment. Protandry expressed. Male gonads appear first, their primordium oblong. Testes situated in row filling all space between excretory canals; oval, measuring 25–60 x 23–40. Cirrus sac formed later than testes; cigar-shaped in developed male proglottids, extending beyond midline of proglottis but not reaching aporal excretory canals, measuring 120–215 x 20–45. Internal seminal vesicle occupying almost entire cirrus sac. External seminal vesicle oval, formed as testes disappear, sometimes overlapping antiporal part of cirrus sac, measuring 50–160 x 35–70. Fully evaginated cirrus lacking in the studied material. Length of partially evaginated

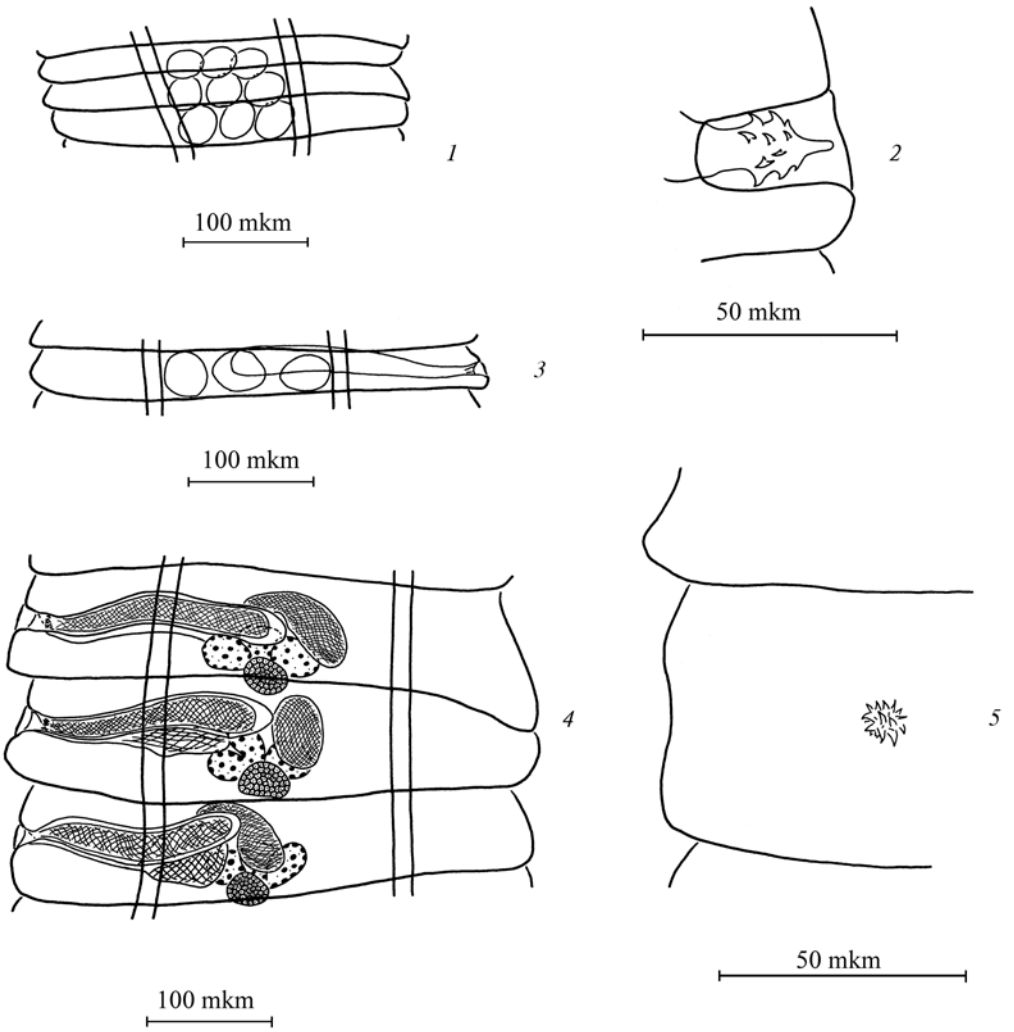

Fig. 6. *Wardium* (s. l.) sp.: *1* — male proglottids; *2* — cirrus; *3* — proglottids with female gonade only; *4* — invaginated cirrus. Scale bars: *1*, 3 — 100 μm; *2*, *4* — 50 μm.

Рис. 6. *Wardium* (s. l.) sp.: *1* — мужские членики; *2* — циррус; *3* — женские членики; *4* — инвагинированный циррус. Масштабные линейки: *1*, *3* — 100 мкм; *2*, *4* — 50 мкм.

cirrus 35, with broad basal unarmed part (13 in diameter), then narrowing to 8 and further passing into expanded part with diameter of 13 and 13 long; latter part armed with large (5 long) spines, situated in diagonal row, 4 hooks per row. Distal part of cirrus tapering as pipette tip, narrow, 3 in diameter, probably unarmed. In withdrawn position, cirrus resembles rosette of spines with diameter of 10 (poorly visible in stained individials). Genital atrium simple, funnel-shaped or tubular, with variable depth, 20–75.

Female gonads appear as oval primordium after disappearance of testes. Ovary forming 3–4 lobes; its maximum width 110. Vitellarium round or oval, measuring 33–45 x 25–30, posterior to anatomic centre of ovary. Vagina opening into genital atrium posterior to orifice of cirrus sac; copulative part funnel-shaped, with diameter 15 μm; conducting part of vagina as narrow tube with diameter of 2.5. No gravid segments were present in studied material.

Family ECHINOCOTYLIDAE

Echinocotyloides longirostris (Rudolphi, 1819) Kornyushin, 1983

Syn.: *Taenia longirostris* Rudolphi, 1819; *Echinocotyle longirostris* (Rudolphi, 1819) Kornyushin, 1967.

Host. *Glareola pratincola*.

Prevalence. In 2 out of 16 birds studied, i. e. 12.5%.

Intensity of infection. 1–19 specimens.

Localities. Crimea, Bokal Spit; the Black Sea National Reserve, Potiivka Plot.

Morphology (fig. 7). Immature specimens about 1.5 mm long. Scolex oval, 90–140 in diameter and 200–230 long. Suckers oval, measuring 85–90 x 50–55, armed with small hooks; armament along anterior margins of suckers consisting of single hooks or hooks arranged in pairs; lateral sucker margins armed with numerous transverse rows of hooks, with 3–4 hooks per transverse row. On bottom surface of suckers, 4–6 randomly situated hooks. In posterior direction, sucker armament interrupted. Rostellar sheath long, extending beyond posterior margin of suckers, measuring 100–160 x 45–70. Rostellum measuring 95–100 x 30–40. Rostellum armed with 10 nitidoid hooks, 35–38 long. Neck 150 long. Internal and external strobilation begin simultaneously. In proglottides, developing gonads distinct. Most developed specimens consisting of 17 segments.

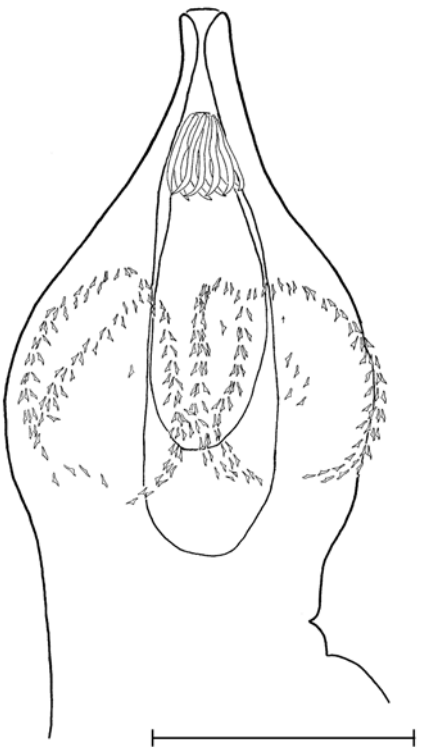

Fig. 7. *Echinocotyloides longirostris*: scolex. Scale bar 100 μm.

Рис. 7. *Echinocotyloides longirostris*: сколекс Масштабная линейка 100 мкм.

The details of the structure of specimens of *E. longirostris* from pratincole correspond to morphology of this cestode recorded from other charadriiform host (Deblock, 1964; Kornyushin, 1967).

Remarks. This species was described from pratincole in Europe (Skriabin, Matevossian, 1945). Today it is registered in many plovers and sand-pipers. In Potiivka Plot of the Black Sea reserve, it was

found in Kentish plover (*Charadrius alexandrius* L.), ruff (*Philomachus pugnax* L.), little stint (*Calidris minuta* (Leisler, 1812)); in Bokal Spit, it was recorded also from avocet (*Recurvirostra avocetta* L.) (Kornyushin, 1967; Smogorzhevskaya et al., 1988).

In conclusion, the fauna of the hymenolepidoid cestodes of pratincole in Ukraine is represented by 4 species. Two of them, *G. porale* and *Wardium* (*s. l.) tauricum* sp. n., are specific pratincole parasites. *E. longirostris* is a common parasite of charadriiform birds. Another cestode, *Wardium* (s. l.) sp., is identified to the generic level only. The previous record of *Wardium himantopodis* from pratincole (Smogorzhevskaya et al., 1988) is now considered as a misidentification and is actually related to *Wardium* (*s. l.) tauricum* sp. n.

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Bondarenko S. K., Kontrimavichus V. L. Aploparaksidae of wild and domesticated birds. — Moscow : Nauka, 2006. — 446 p. — (Principles of Cestodology ; Vol. 14). — Russian : *Бондаренко С. К., Контримавичус В. Л.* Аплопараксиды диких и домашних птиц.

Deblock S. Les Hymenolepis de Charadriiformes (Seconde note a propos d'une vingtaine d'autres descriptions dont deux nouvelles) // Ann. parasitol. hum et comp. — 1964. — **39**, N 6. — P. 695–754.

Gvozdev E. V. Tapeworms of game birds of southern Kazakhstan. // Proc. of Institute of Zoology KazSSR. — 1964. — **22**. — P. 74–109. — Russian : *Гвоздев Е. В.* Ленточные черви охотничье-промысловых птиц Южного Казахстана // Тр. Ин-та зоологии АН КазССР.

Kornyushin V. Cestodes of waterfowl and wading birds of North-Western Black Sea Region : Dis. ... cand. biol. science. — Kyiv, 1967. — 255 p. — Russian : *Корнюшин В. В.* Цестоды водоплавающих и болотных птиц Северо-Западного Причерноморья : Дис. ... канд. биол. наук.

Kornyushin V. Genus Wardium Mayhew, 1927, its range, species composition and place in the system of Hymenolepidoid cestodes // XI Conf. Ukr. Soc. of Parasitologists : Abstracts. Proceedings. — Kyiv, 1993. — P. 67–68. — Russian : *Корнюшин В. В.* Род Wardium Mayhew, 1927, его объем, видовой состав и место в системе гименолепидоидных цестод // XI конф. Укр. об-ва паразитологов : Тез. докл.

Maksimova A. P. Hymenolepidoid cestodes of aquatic birds from Kazakhstan // Institute of Zoology KazSSR. — Alma-Ata, 1989. — 224 p. — Russian : *Максимова А. П.* Цестоды — гименолепидиды водных птиц Казахстана // Ин-т зоологии АН КазССР.

Meggitt F. J. Report on a collection of Cestoda, mainly from Egypt. Pt 2. Cyclophyllidea: family Hymenolepididae // J. Parasitol. — 1927. — **19**. — P.420–450.

Skriabin K. I., Matevossian E. M. Hymenolepidoid cestodes of poultry and game birds. Moscow : OGIZ, 1945. — 488 p. — Russian : *Скрябин К. И., Матевосян Е. М.* Ленточные гельминты — гименолепидиды домашних и охотничье-промысловых птиц.

Smogorzhevskaya L. A., Kornyushin V. V., Iskova N. I. Helminths circulation in the colonies of charadriiform birds // Hydrophilic colonial birds of the Southern Ukraine. — Kyiv : Nauk. dumka, 1988. — P. 158–175. — Russian : *Смогоржевская Л. А., Корнюшин В. В., Искова Н. И.* Циркуляция гельминтов в колониях ржанкообразных птиц // Колониальные гидрофильные птицы Юга Украины / Сиохин и др.

Spassky A. A. Two new genera of Hymenolepidoid cestodes from waders // Proc. AN MSSR. — 1967. — N 1. — P. 11–16. — Russian : *Спасский А. А.* Два новых рода гименолепидид болотной птицы // Изв. АН МССР.