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HYMENOLEPIDID CESTODES FROM GREBES (AVES, PODICIPEDIDAE) IN UKRAINE: THE GENUS *CONFLUARIA*

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Hymenolepidid Cestodes from Grebes (Aves, Podicipedidae) in Ukraine: the Genus *Confluaria*. Vasileva G. P., Korniyushin V. V., Genov T. — Redescriptions of 5 species of the hymenolepidid cestodes from the genus *Confluaria* Ablasov in Spasskaja, 1966 recorded from grebes (Podicipedidae) in Ukraine are presented: *Confluaria podicipina* from *Podiceps nigricollis*; *Confluaria furcifera* from *P. griseogena*, *P. cristatus* and *P. nigricollis*; *Confluaria pseudofurcifera* (new geographical record) from *P. cristatus*; *Confluaria capillaris* from *P. griseogena* and *P. nigricollis*; *Confluaria multistriata* from *Tachybaptus ruficollis*. *Confluaria krabbei* sp. n. from *T. ruficollis* is described. It is differentiated from *C. multistriata* by possessing rostellar hooks with epiphyseal thickenings comprising both handle and guard and by the shorter cirrus-sac which does not reach the mid-line of the proglottis.

Key words: Cestodes, Hymenolepididae, *Confluaria*, grebes, Ukraine.

Цестоды-гимонолепидиды поганок (Aves, Podicipedidae) Украины: род *Confluaria*. Василева Г. П., Корнюшин В. В., Генов Т. — Даны переописания 5 видов гимнолепидид рода *Confluaria* Ablasov in Spasskaja, 1966, зарегистрированных у поганок в Украине: *C. podicipina* от *Podiceps nigricollis*; *C. furcifera* от *P. nigricollis*, *P. griseogena* и *P. cristatus*; *C. pseudofurcifera* (регистрируется в Украине впервые) от *P. cristatus*; *C. capillaris* от *P. griseogena*, *P. nigricollis*; *C. multistriata* от *Tachybaptus ruficollis*. Описан также новый вид *Confluaria krabbei* sp. n. от *T. ruficollis*, который дифференцируется от *C. multistriata* по наличию на крючьях хоботка больших эпифизарных утолщений, охватывающих как рукоятку, так и отросток корня, а также меньшей длине бурсы цирруса, не достигающей средней линии членика.

Ключевые слова: цестоды, Hymenolepididae, *Confluaria*, поганки, Украина.

Introduction

In our previous publication (Vasileva et al., 2001), the species of the genera *Dolpusilepis* Vasileva, Georgiev & Genov, 1998 and *Parafimbriaria* Vogt & Read, 1954 were redescribed on the basis of cestode specimens from grebes (Aves, Podicipedidae) in Ukraine. The further examinations on the hymenolepidid cestodes from grebes in the Parasitological Collection of the I. I. Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine (SIZK) resulted in the identification of 6 species of the genus *Confluaria* Ablasov in Spasskaja, 1966, including one new species. Their description is the aim of the present publication.

Material and methods

Specimens of *Confluaria* spp. from the Parasitological Collection of the SIZK had been isolated from 34 specimens of four grebe species: 12 *Podiceps cristatus* (L.), 10 *P. griseogena* (Boddaert), 10 *P. nigricollis* (Brehm) and 2 *Tachybaptus ruficollis* (Pallas). The birds were captured in the period 1949–1995 from various regions of Ukraine by L. A. Smogorzhevskaya, V. V. Korniyushin, I. V. Grushchinskaya. Localities: Yagotyń (lake Supoy), Kyiv (mouth of Desna river), Pology-Yanenko, Tatsenko (river Dniپر) — Kyiv Region; Prokhorovka, Kaniv, Khreshchatyc (river Dniپر), Trakhtemirov (Kaniv Reservoir), Zhovnino (Kremenchug Reservoir) — Cherkassy Region; Bugayevka (Kremenchug Reservoir) — Poltava Region; Vyshchetarasovka (river Dniپر) — Dnepropetrovsk Region; districts Potievka, Solenozerny, Yagorlytsky Kute Black-Sea Biosphere Reserve (BSBR) — Kherson Region; VilkoVo (Danube Delta) — Odessa Region; Minino (Crimean canal), Olenevka (cape Tarchankut) — Crimea. Details of hosts, localities and collection numbers are given in the text for each species.

Methods were described in the previous publications (Vasileva et al., 2001). The index length of the cirrus-sac/maximum width of the proglottis (L_{CS}/W_P), calculated for well-relaxed mature proglottides (taken from specimens in exact dorso-ventral position only), was used. The index length of the vagina/length of the

cirrus-sac (L_v/L_{CS}), calculated for mature proglottides, was used for distinguishing the two closely related species *Confluaria multistriata* and *C. krabbei*.

The metrical data are given as the range, the mean in parentheses and the number of measurements taken (n). The measurements are given in micrometers unless otherwise stated.

Results

Confluaria Ablasov in Spasskaya, 1966

Syn. *Colymbilepis* Spasskaya, 1966; *Dimorphocanthus* Maksimova, 1989

Remarks. Recently, the Palaearctic species of the genus *Confluaria* were a subject of a taxonomic revision (Vasileva et al., 1999 a, 1999 b, 2000). These studies revealed the validity of *C. capillaris* (Rudolphi, 1810) (Syn. *C. capillaroides* (Fuhrmann, 1906)), *C. multistriata* (Rudolphi, 1810), *C. japonica* (Yamaguti, 1935), *C. furcifera* (Krabbe, 1869) and *C. podicipina* (Szymanski, 1905) (Syn. *C. spasskii* Ablasov in Spasskaya, 1966). In addition, *C. pseudofurcifera* Vasileva, Georgiev & Genov, 2000, a specific parasite of *Podiceps cristatus*, was described. A key to the species was proposed and the previous records of *Confluaria* spp. from Palaearctic grebes were re-evaluated. This revision also confirmed the synonymy of the genera *Colymbilepis* and *Dimorphocanthus* with *Confluaria*, as previously proposed by Czaplinski (in Czaplinski & Vaucher, 1994).

The present study recorded from Ukrainian grebes 5 species of *Confluaria* recently redescribed by Vasileva et al. (1999 a, 1999 b, 2000). In addition, the present material provided a basis for the description of *C. krabbei* sp. n. from *Tachybaptus ruficollis* (Syn. *Confluaria* sp. Vasileva, Georgiev & Genov, 1999 b).

Confluaria podicipina (Szymanski, 1905) Spasskaya, 1966

Syn. *Confluaria spasskii* Ablasov in Spasskaya, 1966

Specimens studied. From *P. nigricollis*, Ukraine: Coll. Nos 49–1, 50–2, Zhovnino, 06.06.1974, 18 mature specimens and about 15 fragments of strobila, stained whole-mounts (14 slides), 6 scoleces mounted in Berlese medium and 6 mature specimens and 12 fragments of strobila, stained whole-mounts (4 slides). Coll. No 68–5, Bugayevka, 13.07.1974, 4 immature specimens and about 10 fragments of strobila, stained whole-mounts (4 slides), all mentioned by Grushchinskaya (1978) as *Confluaria spasskii*. Coll. No 24–1, Solenozerny (BSBR), 15.09.1960, 1 immature specimen, stained whole-mount. Coll. No 186–3, Yagorlytsky Kut (BSBR), 02.11.1963, 1 scolex mounted in Berlese medium and Coll. No 137–1, Yagotyń, 10.10.1952, Coll. No 51–2, Yagorlytsky Kut (BSBR), 12.12.1962, Coll. Nos 714–1, 715–2, Minino, 20.08.1969, Coll. No 54–3, Zhovnino, 08.07.1974 — fragments of strobila or separated scoleces.

Redescription (based on specimens from Coll. No 49–1; fig. 1–6; for some measurements see tab. 1). Strobila band-like, with maximum width at level of pregravid proglottides. Scolex (fig. 1) with anterior conical protrusion and maximum width at middle of suckers. Suckers round, with well-developed musculature. Rostellum powerful, mushroom-like, with well-developed musculature; intensely staining glandular cells situated in it. Rostellar sheath with well-developed musculature of walls, passing beyond posterior margins of suckers; intensely stained glandular masses present in it. Rostellum with crown of 10 hooks; each hook (fig. 2) consists of refractive particle (with well developed blade, shorter guard and handle) and long epiphyseal thickening of both handle and guard. Measurements of rostellar hooks: length of refractive particle 21–24 (23, n=24), length of blade 11–14 (13, n=24), length of base 41–51 (46, n=24). Proglottides (fig. 3–5) craspedote, much wider than long. Genital pores unilateral, situated almost in middle of lateral proglottis margin. Genital atrium (fig. 6) deep, cylindrical, surrounded with intensely stained cells. Ventral and dorsal osmoregulatory canals without transverse anastomoses. Diameter of osmoregulatory canals: ventral 18–31 (25, n=14), dorsal 10–15 (13, n=14). Genital ducts dorsal to osmoregulatory canals.

Strobila protandrous. Testes (fig. 3) three, small, compact; situated dorsally to female glands or to their primordia, usually in median field; testes arranged in triangle, rarely in row. External seminal vesicle (fig. 3–6) oval or elliptical. Cirrus-sac (fig. 3–6) elongate, cylindrical, thin-walled, usually crossing poral osmoregulatory canals; in hermaphroditic mature proglottides cirrus-sac does not extend to mid-line of proglottis. Internal seminal vesicle elongate, occupying almost 1/2 of cirrus-sac. Evaginated cirrus (fig. 3, 6) long, curved, whip-shaped; armed with minute needle-shaped spines arranged in 7–8 longitudinal rows; distal part of evaginated cirrus with sparse spines.

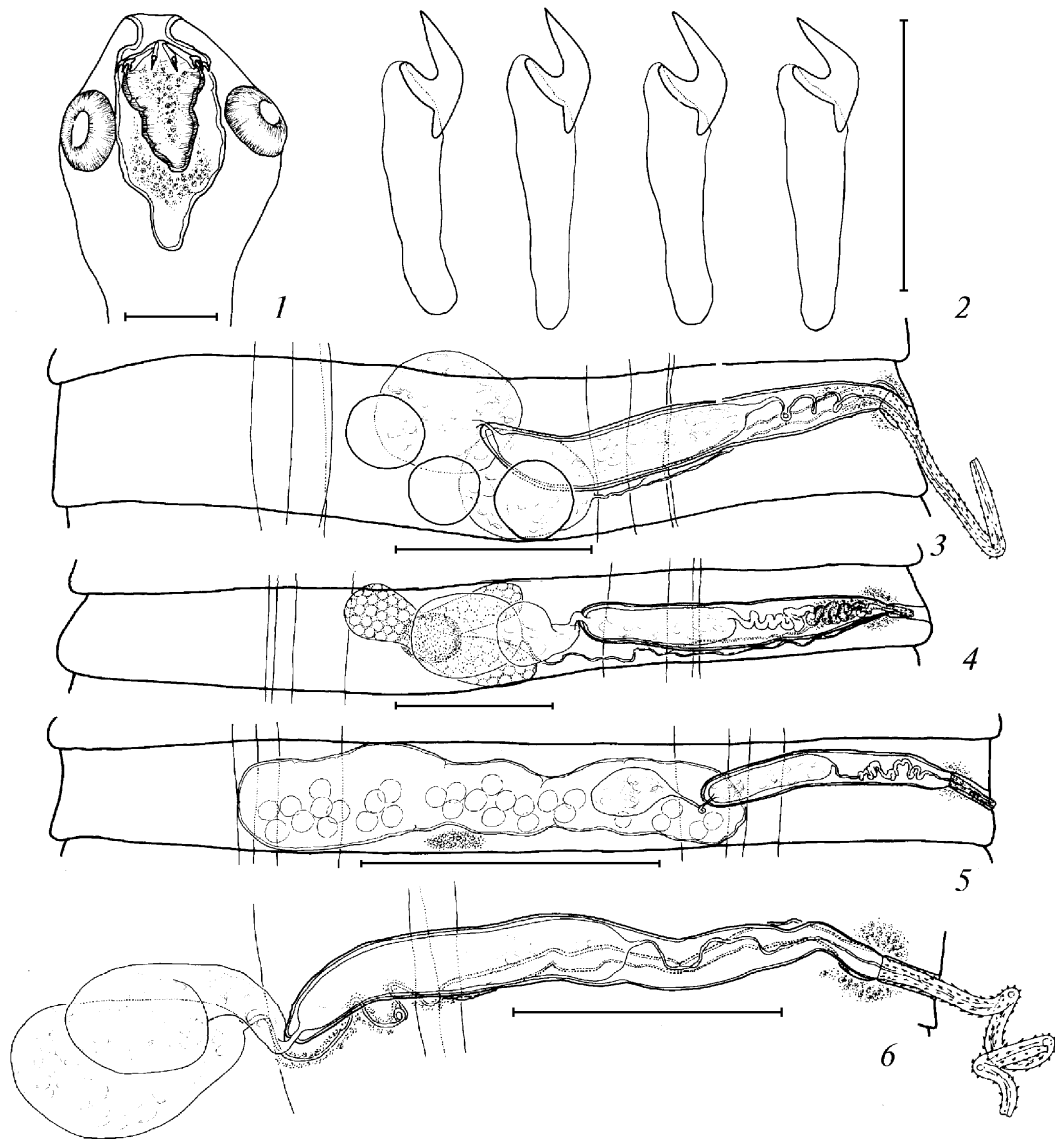


Fig. 1–6. *Confluaria podicipina*, specimens from *P. nigricollis*: 1 — scolex; 2 — rostellar hooks; 3 — male mature proglottis; 4 — hermaphroditic mature proglottis; 5 — pregravid proglottis; 6 — terminal genital ducts in hermaphroditic mature proglottis. Scale-bars: 1, 5 — 100 μm ; 2–4, 6 — 50 μm .

Рис. 1–6. *Confluaria podicipina*, экземпляры от *P. nigricollis*: 1 — сколекс; 2 — крючья хоботка; 3 — мужской членик; 4 — гермафродитный членик; 5 — не вполне зрелый членик; 6 — концевые участки половых протоков в гермафродитном членике. Масштабная линейка: 1, 5 — 100 мкм; 2–4, 6 — 50 мкм.

Vitellarium (fig. 4) compact, median, elliptical. Ovary (fig. 4) median, with three compact lobes. Seminal receptacle (fig. 3–6) oval or elliptical, situated almost at middle of proglottis, dorsally to ovary. Copulatory vagina (fig. 6) long, tubular, thick-walled, opening and passing ventrally to cirrus-sac. Conductive part curved, slender, surrounded with intensely stained cells.

Developing uterus (fig. 5) sac-like, transversely elongated, crossing dorsally osmoregulatory canals. Proglottides with fully-developed uterus and ripe eggs not available.

Remarks. The Ukrainian specimens of *C. podicipina* are in agreement with the main morphological and metrical characters of this species as described by previous authors (Vasileva et al., 2000) (tab. 1). The specimens studied have been reported as *Confluaria spasskii* too (Grushchinskaya, 1978). The present study confirms that this material belongs to *C. podicipina*.

The host range of *C. podicipina* includes *P. auritus* (L.), *P. cristatus*, *P. nigricollis* and *T. ruficollis*, type location — Dublyany, Lvov Region, Ukraine. Its geographical range except Ukraine (Szymanski, 1905 and present study), includes Poland, Slovak Republic, Czech Republic, Romania, Bulgaria, Kazakhstan (Macko, 1962; Rysavy, 1961; Rysavy & Sitko, 1992; Chiriac, 1960; Vasileva et al., 2000). In the Parasitological Collection of the SIZK, specimens collected by A. Eminov from *P. nigricollis* in Turkmenistan are preserved (Coll. Nos 2, 136). Their study revealed the affiliation of this material to *C. podicipina*. The remaining records (Vasileva et al., 2000) have been published without descriptions or illustrations and need further confirmation.

Confluaria furcifera (Krabbe, 1869) Spasskaya, 1966

Specimens studied. From *P. cristatus*: Coll. No 31–2, Khreshchatyk, 11.09.1950, one slide with mature fragment of strobila, stained whole mount.

From *P. grisegena*: Coll. Nos 570–10, 573–13, 567–7, Potievka (BSBR), 10.09.1988, about 20 fragments of strobila, stained whole-mounts (8 slides), 13 scoleces mounted in Berlese medium. Coll. N 856–14, Potievka (BSBR), 17.08.1989, about 5 fragments of strobila, stained whole-mounts (2 slides). Coll. No 29–2, Vyschetarasovka, 15.05.1953, 5 immature specimens, stained whole-mounts (5 slides), 5 scoleces mounted in Berlese medium and Coll. Nos 2–2, 7–4, Olenevka, 04. and 07.08.1958, Coll. Nos 88–1, 518–3 Yagorlytsky Kut (BSBR), 01.04.1963 and 28.11.1964, fragments of strobila or scoleces.

From *P. nigricollis*: Coll. Nos 49–1, 54–3, Zhovnino, 06.06.1974, 2 immature specimens and about 7 fragments of strobila, stained whole-mounts (3 slides). 08.07.1974, 2 immature specimens and 3 fragments of strobila, stained whole-mounts (one slide). Coll. No 24–1, Solenoozerny (BSBR), 15.09.1960, 3 fragments of strobila, stained whole-mounts (2 slides). Coll. No 137–1, Yagotyn, 10.10.1952, 2 immature specimens and 3 fragments of strobila, stained whole-mounts (one slide). Coll. No 51–2 Yagorlytsky Kut (BSBR), 02.12.1962, Coll. No 55–4 Zhovnino, 08.07.1974, fragments of strobila or scoleces.

Table 1. Metrical data for *Confluaria podicipina*

Таблица 1. Метрические данные *Confluaria podicipina*

Metrical data, μm	<i>P. auritus</i> *		<i>P. nigricollis</i> *							
	Ukraine (Szymanski, 1905)		Kazakhstan (Maksimova, 1989)		Bulgaria (Vasileva et al., 2000)			Ukraine (Present study)		
	1		1		1	2	3	1	2	3
Strobila: length, mm	140		170-290		37-71	-	2	16-51	0	13
width, mm	0.4-0.7		0.9-1.0		0.34-0.45		2	0.21-0.43	0.31	13
Scolex: length	372		420		252-378	318	6	199-399	289	10
width	296		340		164-353	269	6	199-264	232	10
Suckers: diameter	115		100-130		65-113	92	24	75-98	91	32
Rostellum: length	150		190		108-163	143	6	95-142	118	10
width	86		84		80-133	104	6	84-121	98	10
Rostellar sheath										
length			380		221-300	250	6	180-232	204	10
width			150		103-163	130	6	90-139	112	10
Rostellar hooks:										
total length	43-46		50-58		45-60	54	24	47-60	54	24
Testes: diameter			17-25		18-28	22	40	15-23	20	26
Cirrus-sac: length			170		98-132	113	33	93-135	119	13
width			17		10-20	13	33	8-15	12	13
Ratio L_{cs}/W_p					0.23-0.36	0.29	30	0.33-0.49	0.39	13
Evag. cirrus: length	99		120		75-113	91	11	85-108	97	10
width	4		4		3		11	3		10
Ext. seminal vesicle:										
length			40		30-43	37	20	41-52	46	10
width										
			8		10-18	14	20	21-28	24	10
Vitellarium: length			40-65		28-43	35	22	23-34	29	10
width			20-25		18-33	23	22	15-26	21	10
Seminal receptacle:										
length					30-45	38	22	36-44	42	10
width					15-38	25	22	23-28	26	10

1 — range; 2 — mean; 3 — quantity; * — host.

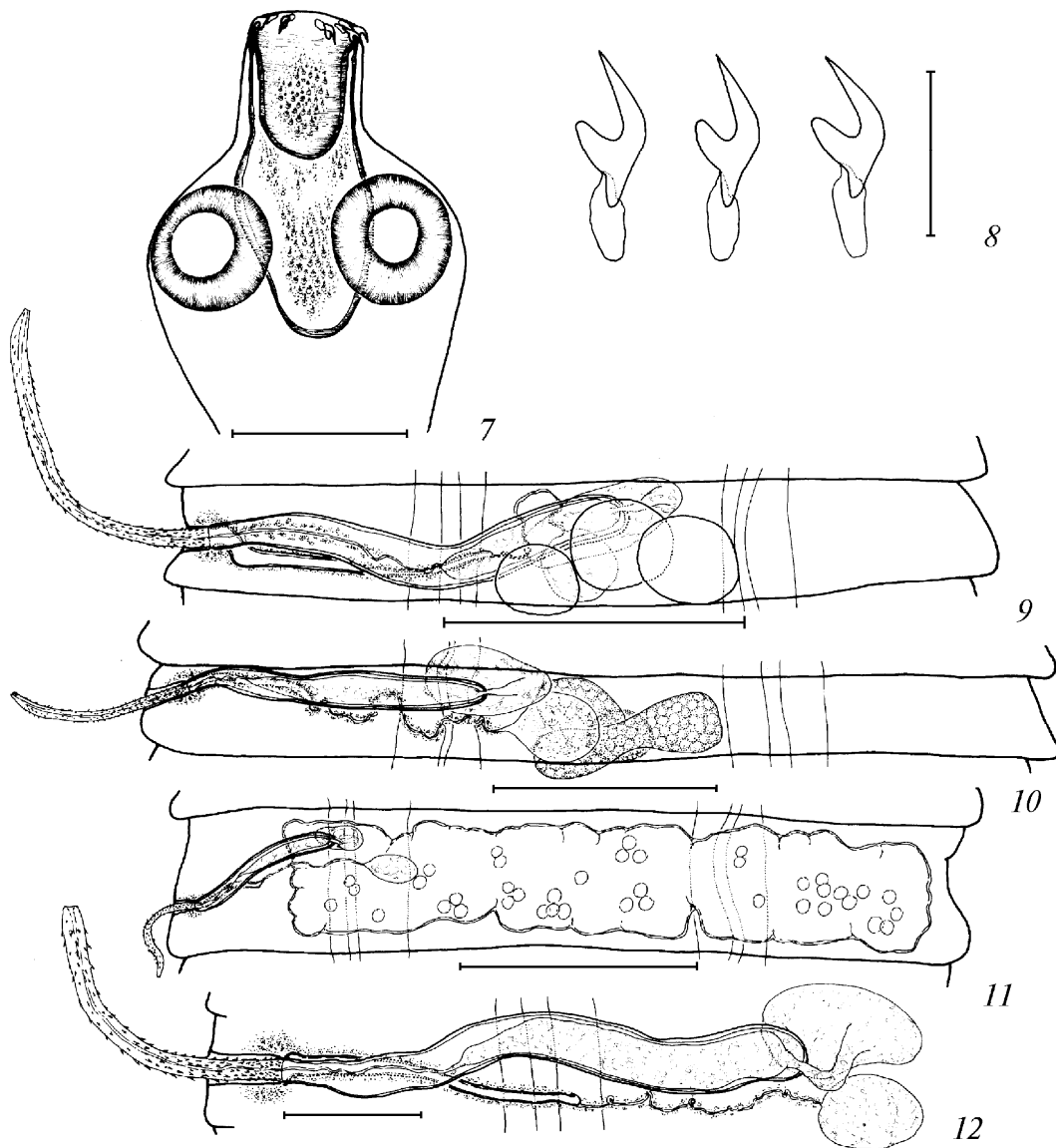


Fig. 7–12. *Confluaria furcifera*, specimens from *P. grisegena*: 7 — scolex; 8 — rostellar hooks; 9 — male mature proglottis; 10 — hermaphroditic mature proglottis; 11 — pregravid proglottis; 12 — terminal genital ducts in hermaphroditic mature proglottis. Scale-bars: 7, 9, 10 — 100 μm ; 8 — 20 μm ; 11 — 200 μm ; 12 — 50 μm .

Рис. 7–12. *Confluaria furcifera*, экземпляры от *P. grisegena*: 7 — сколекс; 8 — крючья хоботка; 9 — мужской членик; 10 — гермафродитный членик; 11 — не вполне зрелый членик; 12 — концевые участки половых протоков в гермафродитном членике. Масштабная линейка: 7, 9, 10 — 100 мкм; 8 — 20 мкм; 11 — 200 мкм; 12 — 50 мкм.

From *T. ruficollis*: Coll. Nos 4–1, 9, Pology Yanenky, 22.08.1953, 20 fragments of strobila, stained whole-mounts (7 slides).

Redescription (based on specimens from *P. grisegena*, Coll. Nos 570–10, 567–7, 573–1; fig. 7–12; for some measurements see tab. 2). Strobila band-like, slender. Scolex (fig. 7) oval, with conically protruded anterior part and maximum width at level of suckers. Suckers oval, with weakly-developed musculature. Rostellum conical, with well-developed musculature; intensely stained cells situated in it. Rostellar sheath thin-walled, passing beyond posterior margins of suckers; intensely stained masses present in it. Rostellar hooks 10; each hook (fig. 8) consisting of refractive particle (with long

blade and shorter guard and handle) and epiphyseal thickening of handle. Measurements of hooks: length of refractive particle 18–21 (19, n=28), length of blade 11–12 (11, n=28), length of base 16–19 (18, n=28). Proglottides (fig. 9–11) craspedote, wider than long. Genital pores unilateral, situated almost in middle of lateral proglottis margin. Genital atrium (fig. 12) cylindrical, surrounded by intensely stained cells. Ventral and dorsal osmoregulatory canals without transverse anastomoses; diameter of ventral osmoregulatory canals 28–39 (34, n=10), diameter of dorsal osmoregulatory canals 10–21 (15, n=10). Genital ducts dorsal to osmoregulatory canals.

Testes (fig. 9) three, compact, situated dorsally to female glands; arranged in one row or in shallow triangle. External seminal vesicle (fig. 9–12) elongate, elliptical. Cirrus-sac (fig. 9–12) elongate, thin-walled, usually crossing poral osmoregulatory canals, sometimes reaching mid-line of proglottis. Internal seminal vesicle elongate, usually occupies more than 1/2 of cirrus-sac. Evaginated cirrus (fig. 9, 12) cylindrical, armed basally with dense, needle-shaped spines; distal part of evaginated cirrus armed with sparse, rosethorn-shaped spines; extremity of fully-evaginated cirrus unarmed.

Vitellarium (fig. 10) compact, elliptical, median. Ovary (fig. 10) with three compact lobes, dorsal to vitellarium, median. Seminal receptacle (fig. 9–12) oval, ventral to male genital ducts and dorsal to ovary. Copulatory vagina (fig. 12) refractive, tubular, surrounded by thin cellular sleeve; opening and passing ventrally to cirrus-sac. Conductive part of vagina coiled, thin-walled, surrounded by intensely stained cells.

Developing uterus (fig. 11) sac-like, transversely elongate, crossing dorsally osmoregulatory canals. Proglottides with fully-developed uterus and ripe eggs not available.

Observations on specimens from *P. nigricollis* (Coll. Nos 49–1, 54–3). The morphology of these specimens is presented in figures 13–18. The metrical data are included in table 2. Additional measurements: Rostellar hooks: length of refractive particle 15–16 (15, n=5), length of blade 8–9 (9, n=5), length of base 15–18 (16, n=5). Diameter of osmoregulatory canals: ventral 23–31 (28, n=10), dorsal 5–10 (8, n=10).

Remarks. The present results on the morphology of *C. furcifera* correspond to the data of the previous descriptions (Vasileva et al., 2000). The comparative study on *C. furcifera* from *P. griseogena* and *P. nigricollis* demonstrates some metrical differences between cestodes found in the two host species (tab. 2). The specimens from *P. griseogena* possess larger rostellar hooks (24–28 μm) whilst those from *P. nigricollis* have rostellar hooks 22–24 μm long (tab. 2) from both Bulgaria and Ukraine. The cestodes from *P. griseogena* have also a larger cirrus-sac compared to those from *P. nigricollis*. In spite of these differences, the main morphological characters of *C. furcifera* from these two hosts are very similar (fig. 7–12, fig. 13–18), especially concerning the shape of the rostellar hooks, the ratio L_{CS}/W_P , the shape and the armament of the evaginated cirrus, the shape and the structure of the vagina which is characterised by a refractive copulatory part. Therefore, the metrical differences of *C. furcifera* from *P. griseogena* and *P. nigricollis* can be regarded as intraspecific variations.

The specimens of *C. furcifera* from *P. cristatus* and *T. ruficollis* consists of fragments of strobila in different stages of development. Their morphological and metrical characters (tab. 2) are in close correspondence with those of the specimens from *P. griseogena*.

Vasileva et al. (2000) redescribed *C. furcifera* from *P. griseogena* (syntypes), *P. nigricollis* and *T. ruficollis* from Bulgaria. In addition to these birds, the host range of this species includes also *Podiceps auritus* and *Podilymbus podiceps* (L.). Its geographical range includes Denmark, Germany, Bulgaria, Russia (Kamchatka), Canada (Vasileva et al., 2000) and Ukraine (present study). Several previous records described cestodes differing in their morphology from the present results (Brglez, 1981; Vasileva et al., 2000). Many authors mentioned this species without publishing any documentations (Vasileva et al., 2000). In view of the presence of another similar species, *Confluaria pseudofurcifera* Vasileva, Georgiev & Genov, 2000, these records need further confirmation.

***Confluaria pseudofurcifera* Vasileva, Georgiev & Genov, 2000**

Syn. *Hymenolepis furcigera* (Krabbe, 1869) of Joyeux & Baer (1950); *H. furcifera* (Krabbe, 1869) of Jarocka (1958) and Korpaczewska (1960); *Confluaria furcifera* (Krabbe, 1869) of Galkin (1986) and Rysavy & Sitko (1995)

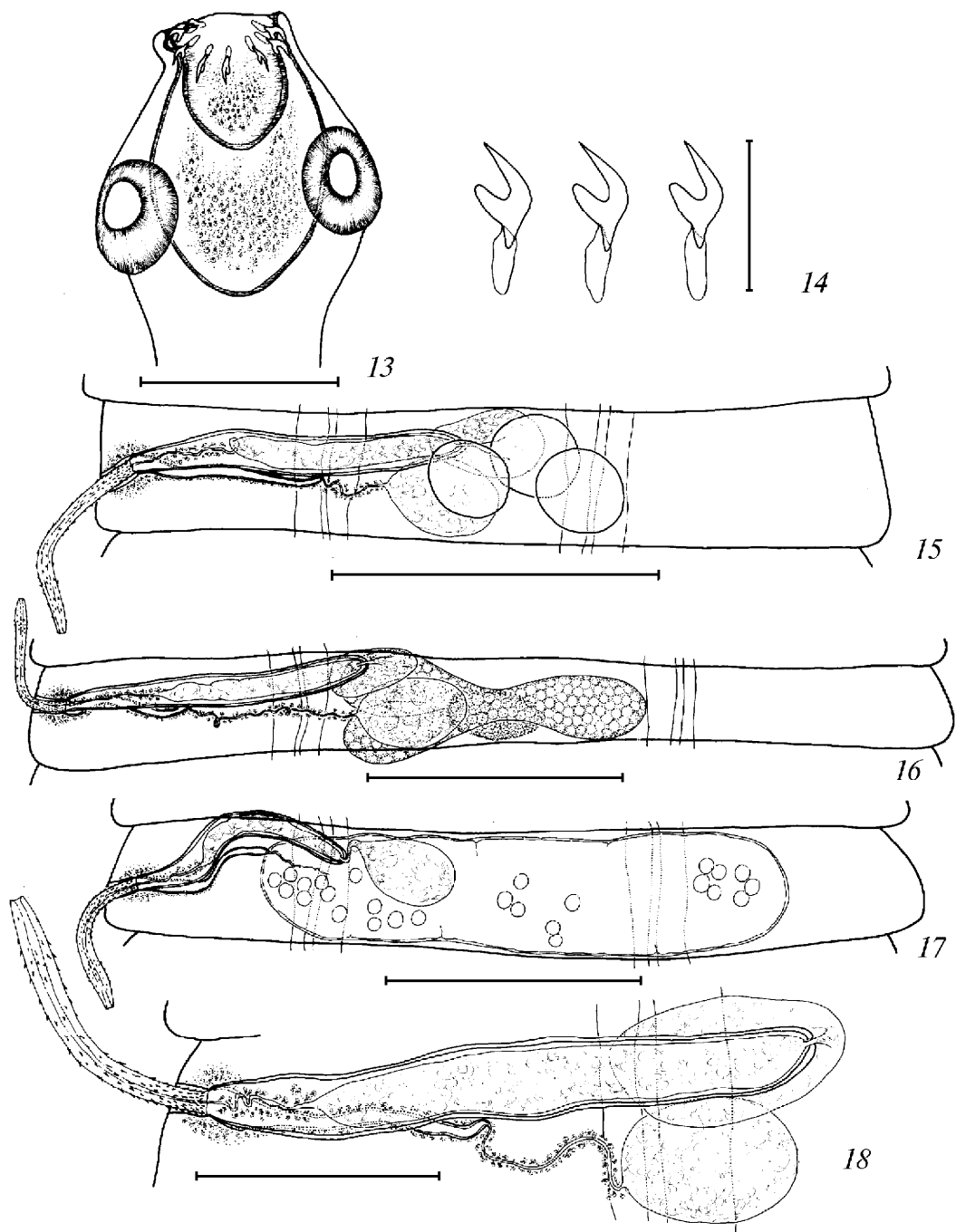


Fig. 13–18. *Confluaria furcifera*, specimens from *P. nigricollis*: 13 — scolex; 14 — rostellar hooks; 15 — male mature proglottis; 16 — hermaphroditic mature proglottis; 17 — pregravid proglottis; 18 — terminal genital ducts in hermaphroditic mature proglottis. Scale-bars: 13, 15–17 — 100 μm ; 14 — 20 μm ; 18 — 50 μm .

Рис. 13–18. *Confluaria furcifera*, экземпляры от *P. nigricollis*: 13 — сколекс; 14 — крючья хоботка; 15 — мужской членик; 16 — гермафродитный членик; 17 — не вполне зрелый членик; 18 — концевые участки половых протоков в гермафродитном членике. Масштабная линейка: 13, 15–17 — 100 мкм; 14 — 20 мкм; 18 — 50 мкм.

Specimens studied. From *P. cristatus*: Coll. No 1–1, Khreshchatyk, 19.10.1952, 1 immature specimen and 12 fragments of strobila, stained and mounted in Canada balsam (3 slides), 1 scolex mounted in Berlese medium. Coll. Nos 9–4, 11–5, Khreshchatyk, 29.10.1952, about 20 fragments of strobila, stained and mounted in Canada balsam (5 slides). Coll. No 31–2, 11.09.1950, Coll. No 33–3, Kaniv, 17.09.1950, 2

Table 3. Metrical data for *Confluaria pseudofurcifera* from *P. cristatus*Таблица 3. Метрические данные *Confluaria pseudofurcifera* от *P. cristatus*

Metrical data, μm	Switzerland (Vasileva et al., 2000)			Bulgaria (Vasileva et al., 2000)			Ukraine (Present study)		
	1	2	3	1	2	3	1	2	3
Strobila: length, mm	42-59	-	2	25-32	29	4	221-234	-	2
width, mm	0.4-0.7	-	2	0.4-0.5	0.5	4	0.8-1.0	-	2
Scolex: length	168-219	186	4	152-215	188	6	180-238	173	3
width	137-170	159	4	145-179	162	6	160-180	173	3
Suckers: diameter	57-72	65	16	52-72	62	24	64-75	71	12
Rostellum: length	108-116	112	4	81-90	89	6	103-124	114	3
width	62-64	64	4	50-66	60	6	52-64	60	3
Rostellar sheath									
length	149-168	160	4	137-175	156	6	147-186	163	3
width	72-82	78	4	68-86	77	6	82-90	87	3
Rostellar hooks									
total length	31-37	35	16	32-37	34	10	31-36	34	11
Testes: diameter	44-49	46	20	36-62	44	30	41-64	56	20
Cirrus-sac: length	180-257	224	20	180-212	200	20	267-302	285	10
width	26-32	27	20	18-23	19	20	10-13	12	10
Ratio L_{cs}/W_p	0.29-0.38	0.35	20	0.36-0.42	0.39	20	0.32-0.36	0.34	10
Evag. cirrus:									
length of basal part	13-23	19	10	8-15	10	12	15-18	17	10
width of basal part	13-18	14	10	10-21	14	12	15-18	16	10
length of distal part	13-23	16	10	21-31	26	12	23-31	28	10
width of distal part	3	-	10	3	-	12	3	-	10
Ext. seminal vesicle:									
length	110-180	152	13	52-103	79	17	77-121	102	10
width	31-57	47	13	21-52	37	17	36-77	54	10
Vitellarium: length	59-67	64	10	59-75	68	15	57-77	64	10
width	31-39	34	10	23-36	29	15	31-39	34	10
Seminal receptacle (full):									
length	103-180	139	15	137-173	153	10	103-173	137	10
width	31-62	45	15	44-77	62	10	41-62	50	10
Copulatory vagina length	31-36	33	8	31-36	33	15	36-41	38	6
width	3-8	5	8	3-8	5	15	3-8	5	6

1 — range; 2 — mean; 3 — quantity.

scolecemes mounted in Berlese medium. Coll. No 97-1, Prohorovka, 06.09.1949, 10 fragments of strobila, stained and mounted in Canada balsam (3 slides). Coll. No 28-1, Vyshchetarasovka, 15.05.1953, 4 fragments of strobila, stained and mounted in Canada balsam (1 slide). Coll. No 291-2, Potievka (BSBR), 29.07.1987, 3 mature specimens stained whole-mounts (5 slides), 1 specimen and 4 fragments of strobila mounted in Berlese medium (2 slides). Coll. No 1031-1, Vilkovo, 30.07.1995, 1 immature specimen mounted in Berlese medium. Coll. No 37-4, Khreshchatyk, 22.09.1950, Coll. No 1-1, Kyiv, 01.04.1953, Coll Nos 70-1, 71-2, Zhovnino, 15 and 16.07.1974 — fragments of strobila or scolecemes.

Redescription (based on specimens from Coll. No 291-2; fig. 19-24; for measurements see tab. 3). Strobila band-like. Scolex (fig. 19) with conically tapering anterior part; maximum width at about middle of suckers. Neck long. Suckers round, unarmed, with well-developed musculature. Rostellum with well-developed musculature of walls; intensely staining glandular cells situated centrally. Rostellar sheath with weakly-developed musculature of walls, passing beyond posterior margins of suckers; intensely stained glandular masses present in it. Rostellum with crown of 10 hooks; each hook (fig. 20) consisting of refractive particle (with long straight blade, short handle and slightly larger guard), and large epiphyseal thickening of both handle and guard. Measurements of hooks: length of refractive particle 20-24 (22, n=11), length of blade 13-15 (14, n=11), length of base 23-27 (25, n=11). Proglottides (fig. 21-23) craspedote, much wider than long. Genital pores unilateral, situated almost at middle of lateral proglottis margin. Genital atrium (fig. 24) deep, thick-walled, cylindrical, surrounded by intensely stained cells. Ventral and dorsal osmoregulatory canals without transverse anastomoses; diameter of dorsal osmoregulatory canals 10-31 (16,

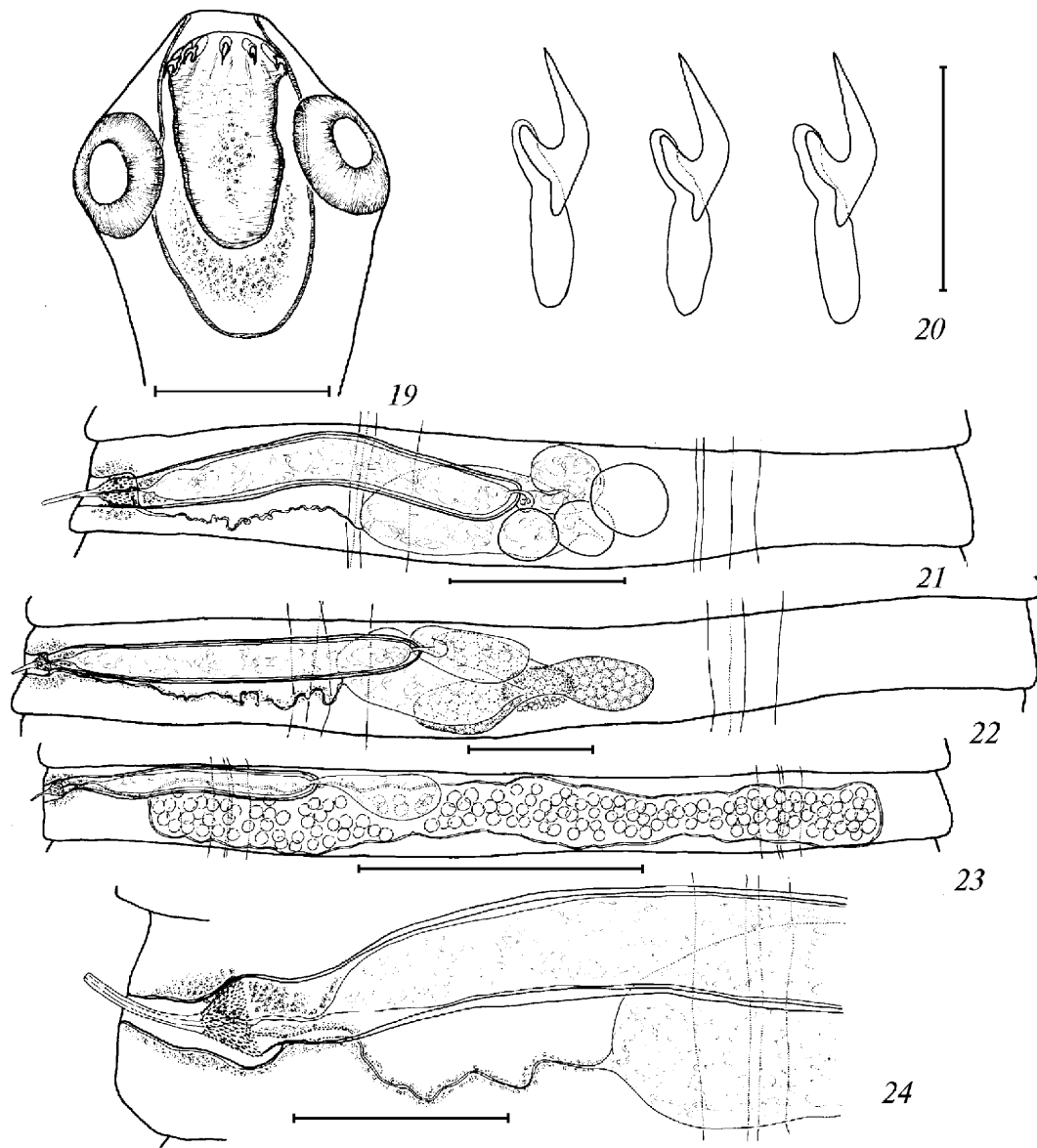


Fig. 19–24. *Confluaria pseudofurcifera*, specimens from *P. cristatus*: 19 — scolex; 20 — rostellar hooks; 21 — male mature proglottis; 22 — hermaphroditic mature proglottis; 23 — pregravid proglottis; 24 — terminal genital ducts. Scale-bars: 19, 21, 22 — 100 μm ; 20 — 30 μm ; 23 — 300 μm ; 24 — 50 μm .

Рис. 19–24. *Confluaria pseudofurcifera*, экземпляры от *P. cristatus*: 19 — сколекс; 20 — крючья хоботка; 21 — мужской членик; 22 — гермафродитный членик; 23 — не вполне зрелый членик; 24 — концевые участки половых протоков. Масштабная линейка: 19, 21, 22 — 100 мкм; 20 — 30 мкм; 23 — 300 мкм; 24 — 50 мкм.

$n=10$); diameter of ventral osmoregulatory canals 21–52 (29, $n=10$). Genital ducts dorsal to osmoregulatory canals.

Strobila protandrous. Testes (fig. 21) three, oval, compact, situated usually in triangle, rarely in one row; dorsal to female primordia. External seminal vesicle (fig. 21–23) elliptical, situated dorsal to female glands and seminal receptacle. Cirrus-sac (fig. 21–23) elongate, thin-walled; intensely stained cells surrounding ejaculatory duct; in “male” proglottides, cirrus-sac crossing poral osmoregulatory canals, ratio L_{CS}/W_P 0.47–0.53 (0.49, $n=10$); in mature hermaphroditic proglottides, cirrus-sac shorter and never reaching mid-line of proglottis. Internal seminal vesicle (fig. 21–23) large, elongate, occupy

ing almost all cirrus-sac. Evaginated cirrus (fig. 24) with enlarged conical basal part armed with rosethorn-shaped spines and thin, cylindrical, unarmed distal part.

Vitellarium (fig. 21) compact, elliptical, median. Ovary (fig. 21) with three compact lobes, median, dorsal to vitellarium. Seminal receptacle (fig. 21, 22) elongate, sac-like, voluminous; situated dorsally to ovary. Copulatory part of vagina (fig. 24) funnel-shaped, thick-walled, with thin cellular sleeve; opening and passing ventrally or postero-ventrally to cirrus-sac. Conductive part of vagina (fig. 24) thin-walled, with thin cellular sleeve.

Uterus (fig. 23) sac-like, transversely elongate, crossing osmoregulatory canals dorsally to them, fills complete proglottis with further maturation. Eggs with oval embryophore, with diameter 23–28 (25, n=8); oncosphere round, with diameter 15–18 (16, n=8); length of embryonic hooks 8–10 (8, n=10).

Remarks. The present results on *C. pseudofurcifera*, including the metrical data (tab. 3), are in agreement with the original description (Vasileva et al., 2000). *C. pseudofurcifera* is a specific parasite of *P. cristatus* (confirmed also by the present results). On the basis of the re-examination of specimens or the re-evaluation of published descriptions or illustrations, Vasileva et al. (2000) recognised some previous records of *C. furcifera* from *P. cristatus* in Europe as referring to *C. pseudofurcifera* (see above). The geographical range of this species includes Switzerland, Poland, Russia (Kaliningrad Region), Czech Republic, Bulgaria (Rysavy, Sitko, 1995; Vasileva et al., 2000) and Ukraine (present study).

Confluaria capillaris (Rudolphi, 1810) Spasskaya, 1966

Syn. *Confluaria capillaroides* (Fuhrmann, 1906) Spasskaya, 1966

Table 4. Metrical data for *Confluaria capillaris*

Таблица 4. Метрические данные *Confluaria capillaris*

Metrical data, μm	Germany ? (Vasileva et al., 1999 a)**			Brasil (Vasileva et al., 1999 a)***			Bulgaria (Vasileva et al., 1999 a)			Ukraine (Present study)		
	<i>Podiceps auritus</i> *			<i>Tachybaptus dominicus</i> *			<i>P. griseogena</i> *			<i>P. griseogena</i> *		
	1	2	3	1	2	3	1	2	3	1	2	3
Strobila: length, mm	13-19	16	3	29	-	1	-	-	-	-	-	-
width, mm	0.1	-	3	0.4	-	1	-	-	-	-	-	-
Scolex length	196	-	1	157-186	168	3	135-182	153	5	-	-	-
width	180	-	1	103-142	121	3	109-127	118	5	-	-	-
Suckers: diameter	59-62	-	2	46-52	49	12	44-56	48	20	-	-	-
Rostellum length	-	-	-	49-64	55	3	51-64	59	5	-	-	-
width	-	-	-	36-39	38	3	29-38	34	5	-	-	-
Rostellar sheath: length	-	-	-	116-137	123	3	100-136	122	5	-	-	-
width	-	-	-	34-57	46	3	45-53	48	5	-	-	-
Rostellar hooks:												
total length	18-21	19	5	20-23	21	7	19	-	7	-	-	-
Testes: diameter	26-31	28	5	21-34	26	40	-	-	-	18-23	21	20
Cirrus-sac length	77-103	89	10	82-106	94	20	-	-	-	90-111	104	16
width	10-18	13	10	13-21	16	20	-	-	-	13-18	14	16
Ratio L_{CS}/W_P	0.25-0.44	0.34	10	0.30-0.47	0.39	20	-	-	-	0.21-0.27	0.24	16
Ev. cirrus: length	18-26	20	7	21-28	24	20	-	-	-	18-39	28	11
width	3	-	7	3	-	20	-	-	-	3	-	11
External seminal vesicle:												
length	26-36	30	5	21-31	26	20	-	-	-	39-49	43	10
width	18-21	20	5	10-21	17	20	-	-	-	18-39	25	10
Vitellarium: length	20-27	24	10	31-39	35	10	-	-	-	31-44	38	11
width	15-20	17	10	23-28	26	10	-	-	-	26-36	29	11
Seminal receptacle:												
length	-	-	-	28-44	38	20	-	-	-	31-44	38	11
width	-	-	-	23-28	25	20	-	-	-	23-34	28	11

1 — range; 2 — mean; 3 — quantity; * — host; ** — syntypes of *C. capillaris* (Rudolphi, 1810); *** — syntypes of *C. capillaroides* (Fuhrmann, 1906).

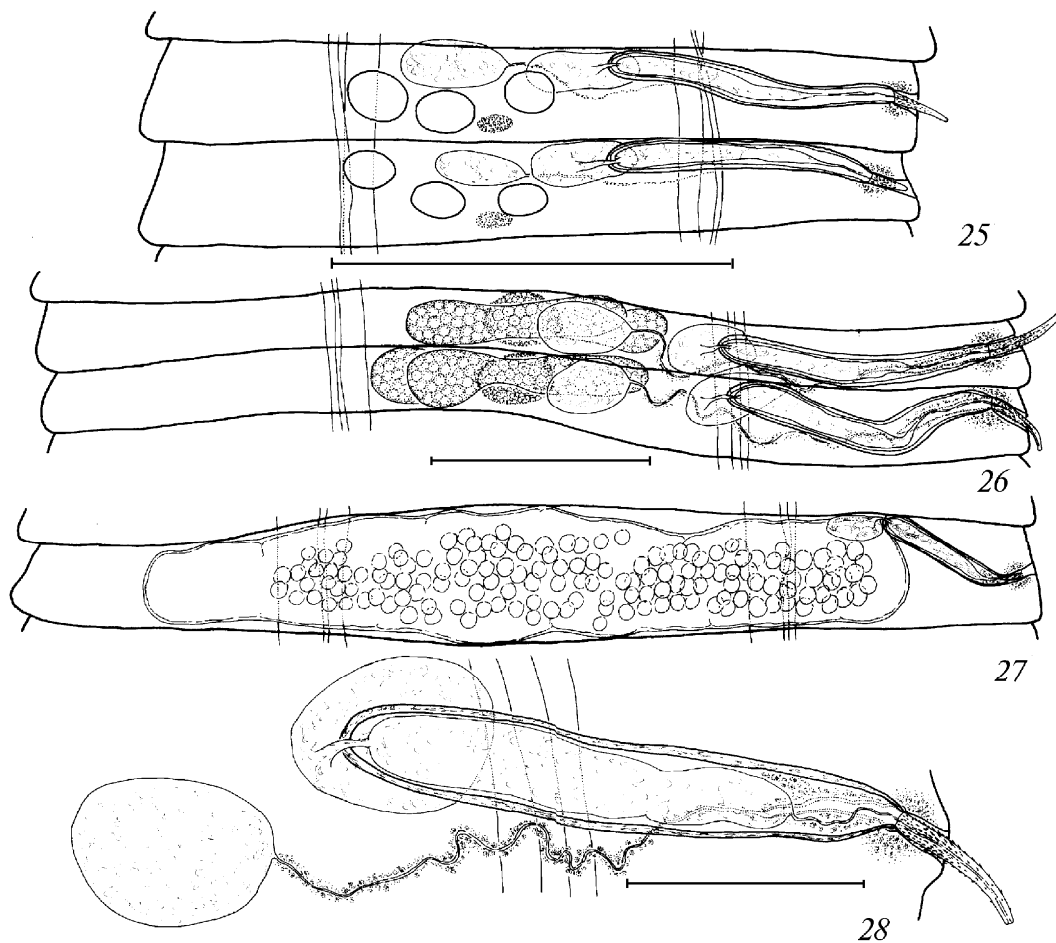


Fig. 25–28. *Confluaria capillaris*, specimens from *P. grisegena*: 25 — male mature proglottides; 26 — hermaphroditic mature proglottis; 27 — pregravid proglottis; 28 — terminal genital ducts. Scale-bars: 25–27 — 100 μm ; 28 — 50 μm .

Рис. 25–28. *Confluaria capillaris*, экземпляры от *P. grisegena*: 25 — мужские членики; 26 — гермафродитные членики; 27 — не вполне зрелый членик; 28 — концевые участки половых протоков. Масштабная линейка: 25–27 — 100 мкм; 28 — 50 мкм.

Specimens studied. From *P. grisegena*: Coll. No 12–1, Vyshchetarasovka, 10.05.1953, 24 fragments of strobila, stained whole-mounts (5 slides), scoleces not available. Coll. No 572–14, Potievka (BSBR), 10.09.1988, 1 specimen, mounted in Berlese medium.

From *P. nigricollis*: Coll. Nos 54–3, 55–4, Zhovnino, 06.06. and 08.07.1974, Coll. No 68–5, Bugayevka, 13.07.74 — fragments of strobila.

Redescription (fig. 25–28; for some measurements see tab. 4). Strobila slender. Proglottides (fig. 25–27) craspedote, wider than long. Genital pores open at about middle of lateral proglottis margin. Genital atrium (fig. 28) cylindrical, surrounded by intensely stained cells. Ventral and dorsal osmoregulatory canals without transverse anastomoses; diameter of ventral osmoregulatory canals 8–28 (17, $n=15$), diameter of dorsal osmoregulatory canals 3–15 (7, $n=15$). Genital ducts dorsal to osmoregulatory canals.

Testes (fig. 25) three, compact, arranged in flattened triangle, one poral or overlapping primordium of vitellarium; two testes antiporal. External seminal vesicle (fig. 25–28) elliptical or oval, situated dorsally to female glands. Cirrus-sac (fig. 25–28) with comparatively thick walls, elongate, with rounded antiporal and tapering poral end; reaching poral osmoregulatory canals, in “male” mature proglottides crossing them; never reaching mid-line of proglottis. Internal seminal vesicle (fig. 28) occupy-

ing almost all cirrus-sac. Evaginated cirrus (fig. 28) thin, conical, armed with minute needle-shaped spines situated more densely at base and lacking at cirrus tip.

Vitellarium (fig. 26) elliptical or oval, compact, median. Ovary (fig. 26) with three compact oval lobes, situated centrally, dorsal to vitellarium. Seminal receptacle (fig. 26–28) oval, situated dorsally to ovary. Vagina (fig. 28) with funnel-shaped, thick-walled copulatory part, opening and passing ventrally to cirrus-sac. Conductive part of vagina slender, curved, surrounded by intensely stained cells.

Uterus (fig. 27) sac-like, transversely elongate, situated dorsally to osmoregulatory canals and ventrally to cirrus-sac. Fully-developed uterus fills entire proglottis. Eggs with thin-walled, oval embryophore with diameter 23–26 (25, n=10); oncosphere round, with diameter 13–18 (16, n=10); embryonic hooks 5–8 (7, n=10) long.

Remarks. The present results on the morphology, including metrical data (tab. 4), correspond well to the recent redescription of this species (Vasileva et al., 1999 a). The cirrus-sac and the evaginated cirrus of specimens from Ukraine are similar in shape and size to those of the types and specimens from Bulgaria. Although there are no scoleces in the material from Ukraine, on the basis of the similarities in the strobilar morphology, we regard these specimens from *P. grisegena* as belonging to *C. capillaris*.

The comparative study of types of *C. capillaris* and *Hymenolepis capillaroides* (Fuhrmann, 1906) revealed the position of *C. capillaroides* as a junior synonym of *C. capillaris* (Vasileva et al., 1999 a). The host range of *C. capillaris* includes *P. auritus*, *P. cristatus*, *P. grisegena*, *P. nigricollis* and *T. dominicus*. On the basis of the well-documented previous records, its geographical range includes Germany (?), Iceland, Czech Republic, Slovak Republic, Bulgaria, Kazakhstan and Brasil (Vasileva et al., 1999 a). The present study adds also Ukraine to this list. All the other previous records need confirmation because they do not include either descriptions or illustrations.

***Confluaria multistriata* (Rudolphi, 1810) Spasskaya, 1966**

Syn. *Confluaria podicipina* (Szymanski, 1905) of Galkin (1986)

Specimens studied. From *T. ruficollis*: Coll. No 235, Tatsenky, 12.08.1976, 6 mature specimens and about 15 fragments of strobila, stained whole-mounts (4 slides), 7 scoleces, mounted in Berlese medium. Coll. Nos 4–1, Pology Yanenky, 22.08.1953, 1 mature specimen and about 25 fragments of strobila, stained whole-mounts (10 slides).

Redescription. (fig. 29–34; for some measurements see tab. 5). Strobila band-like, with maximum width at gravid proglottides. Scolex (fig. 29) oval, with conically protruded anterior part and maximum width at level of suckers. Suckers round, muscular, unarmed. Rostellum powerful, with well-developed musculature; intensely stained cells present in it. Rostellar sheath sac-like, with weakly-developed musculature of walls; intensely stained glandular masses situated in it. Rostellum provided with crown of 10 hooks. Each hook (fig. 30) with refractive particle and epiphyseal thickening of handle. Measurements of rostellar hooks: length of refractive particle 45–51 (49, n=18), length of blade 18–21 (19, n=18), length of base 36–40 (38, n=18). Proglottides craspedote. Genital pores unilateral, opened almost in middle of lateral margin of mature proglottides. Genital atrium (fig. 31–34) deep, cylindrical, surrounded by intensely stained cells. Ventral and dorsal osmoregulatory canals without transverse anastomoses; diameter of dorsal osmoregulatory canals 5–13 (8, n=12), diameter of ventral 15–52 (26, n=12). Genital ducts dorsal to osmoregulatory canals.

Testes (fig. 31) three, compact, situated in flattened triangle, rarely in one row; usually antipodal testis disposed slightly anteriorly. External seminal vesicle (fig. 31–34) elliptical or oval, often overlapping antipodal end of cirrus-sac; situated anteriorly and dorsally to female glands. Cirrus-sac (fig. 31–34) elongated, thick-walled; crossing dorsal osmoregulatory canals, usually crossing mid-line of proglottis. Internal seminal vesicle elongate, occupies more than 1/2 of cirrus-sac. Evaginated cirrus (fig. 31–34) cylindrical, distally enlarged, armed with sparse rosethorn-shaped spines on distal part and dense fine spines at basal part; fully-evaginated cirrus with conical terminal portion without armament.

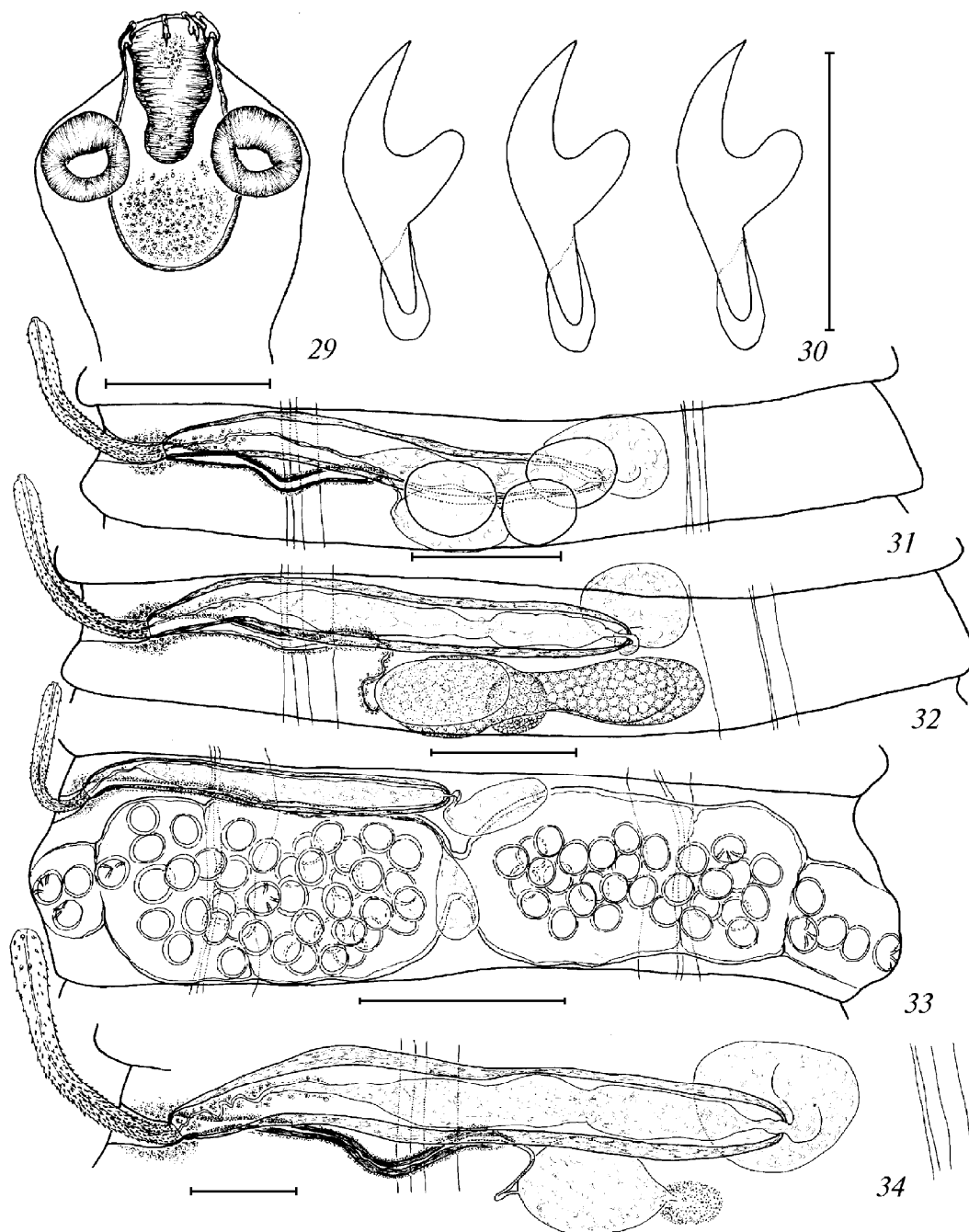


Fig. 29–34. *Confluaria multistriata*, specimens from *T. ruficollis*: 29 — scolex; 30 — rostellar hooks; 31 — male mature proglottis; 32 — hermaphroditic mature proglottis; 33 — gravid proglottis; 34 — terminal genital ducts. Scale-bars: 29, 33 — 200 μm ; 31, 32 — 100 μm ; 30, 34 — 50 μm .

Рис. 29–34. *Confluaria multistriata*, экземпляры от *T. ruficollis*: 29 — сколекс; 30 — крючья хоботка; 31 — мужской членик; 32 — гермафродитные членики; 33 — зрелый членик; 34 — концевые участки половых протоков. Масштабная линейка: 29, 33 — 200 мкм; 31, 32 — 100 мкм; 30, 34 — 50 мкм.

Vitellarium (fig. 32) compact, median. Ovary (fig. 32) median, with three compact transversely elongate lobes. Seminal receptacle (fig. 34) oval or elliptical, situated dorsally to ovary. Copulatory part of vagina (fig. 31–34) tubular, thick-walled, surrounded by thin cellular sheath, opening and passing ventrally or postero-ventrally to cirrus-sac; length of copulatory vagina almost 1/2 of length of cirrus-sac. Ratio L_V/L_{CS}

Table 5. Metrical data for *Confluaria multistriata* from *Tachybaptus ruficollis*Таблица 5. Метрические данные *Confluaria multistriata* от *Tachybaptus ruficollis*

Metrical data, μm	Locality unknown (Vasileva et al., 1999 b)*			Bulgaria (Vasileva et al., 1999 b)			France (Vasileva et al., 1999 b)			Ukraine (Present study)		
	1	2	3	1	2	3	1	2	3	1	2	3
Strobila:												
length, mm	-	-	-	16-27	22	9	24	-	1	10-15	12	4
width, mm	-	-	-	0.26-0.38	0.32	9	0.5	-	1	0.4-0.7	0.5	4
Scolex length	-	-	-	227-272	260	9	321-386	356	5	289-366	348	6
width	-	-	-	159-218	181	9	302-366	323	5	257-347	308	6
Suckers: diameter	-	-	-	53-64	58	36	77-99	87	20	101-124	112	24
Rostellum length	-	-	-	109-136	126	9	137-180	156	5	142-173	160	6
width	-	-	-	64-73	67	9	77-108	94	5	99-113	104	6
Rostellar sheath	:											
length	-	-	-	182-245	213	9	209-289	254	5	237-289	259	6
width	-	-	-	86-123	102	9	119-160	138	5	141-178	157	6
Rostellar hooks:												
total length	-	-	-	51-53	53	29	47-51	48	17	49-56	53	18
Testes diameter	26-31	26	15	18-25	23	40	41-52	47	20	44-59	54	24
Cirrus-sac length	186-283	235	20	163-180	170	20	231-283	257	20	296-347	320	20
width	26-32	28	20	16-20	18	20	31-39	36	20	39-51	45	20
Ratio L_{CS}/W_P	0.57-0.67	0.61	20	0.56-0.69	0.64	30	0.54-0.70	0.62	20	0.48-0.53	0.52	20
Evag. cirrus: length	106-126	116	15	113-127	119	20	119-147	131	10	142-162	153	10
width	10-13	13	15	9-13	11	20	13-15	15	10	15	10	
Ext. seminal vesicle:												
length	52-67	62	15	44-55	51	20	64-88	77	15	77-103	84	12
width	36-44	40	15	27-33	31	20	46-64	54	15	44-70	61	12
Vitellarium: length												
length	36-39	38	10	22-27	25	20	44-49	46	10	46-59	51	10
width	26-31	28	10	16-24	19	20	31-39	34	10	36-44	39	10
Seminal receptacle:												
length	39-52	46	15	45-60	54	20	54-72	63	10	52-77	67	10
width	26-39	30	15	24-35	28	20	31-52	38	10	39-46	42	10
Cop vagina: length												
length	121-137	129	15	102-127	112	20	129-152	138	10	147-168	153	10
width	8	-	15	9-13	10	20	8-10	9	10	8-13	10	10

1 — range; 2 — mean; 3 — quantity; * — material from Rudolphi's collection.

measures: 0.45–0.51 (0.49, n=20) for “male” proglottides, 0.45–0.51 (0.48, n=20) for mature hermaphroditic proglottides and 0.44–0.52 (0.48, n=20) for pregravid and gravid proglottides. Conductive part thin, coiled.

Uterus (fig. 33) sac-like, usually divided into two transversely elongate lobes; crossing dorsally osmoregulatory canals. Fully developed uterus occupying almost entire proglottis. Eggs with thin-walled outer shell; embryophore oval or elliptical, with diameter 34–39 (36, n=10); oncosphere oval, with diameter 28–31 (30, n=10); embryonic hooks 10–13 (13, n=10) long.

Remarks. The present material corresponds to the previous descriptions of this species from the same host (Vasileva et al., 1999 b). The metrical data are also similar (tab. 5). The specimens from Ukraine possess a larger scolex, and testes, external seminal vesicle and longer cirrus-sac and vagina, especially in comparison with cestodes described from Bulgaria (Vasileva et al., 1999 b). These variations in the metrical data could be explained by the differences in the development of the strobila of the cestodes from these two localities. The cestodes from Ukraine have gravid strobila, with fully-developed uteri and ripe eggs whilst those from Bulgarian Black Sea coast terminate with proglottides with a developing uterus.

According to Vasileva et al. (2000), the ratio L_{CS}/W_P was defined as “almost constant in all mature proglottides” in *Confluaria* spp., with the only exception *C. pseudofurcifera*. In the present study, we examined more abundant material of *C. multistriata* than previously available. In Ukrainian specimens of this species, L_{CS}/W_P varies from 0.56–0.71 (0.60, n=20) for “male” to 0.48–0.53 (0.52, n=20) for hermaphroditic proglottides, i. e., it is not constant in proglottides at the different degree of maturation. Therefore, *C. multistriata* can also be characterised as having a varying ratio L_{CS}/W_P .

The host range of *C. multistriata* includes *Tachybaptus ruficollis ruficollis*, *T. ruficollis capensis*, *Podiceps cristatus*, *P. nigricollis* and *P. auritus*. Its geographical range is Switzerland, France, Czech Republic, Spain, Russia (Kaliningrad Region), Bulgaria, Tadjikistan, India (Illescas-Gomez & Lopez-Roman, 1980; Vasileva et al., 1999 b; Singh, 1959) and Ukraine (present study).

***Confluaria krabbei* Vasileva, Korniyushin et Genov, sp. n.**Syn. *Confluaria* sp. Vasileva, Georgiev & Genov, 1999 b

Specimens studied. From *T. ruficollis*: Holotype: BMNH 2000.11.15.1, Pology Yanenky, Pereyaslav — Khmel'nytsky rayon, Kyiv Region, 22.08.1953, one slide containing one mature specimen, stained whole-mount (from Coll. No 4-1 (9)). Paratypes: Parasitological Collection, Institute of Zoology, Kyiv, Coll. No 4-1 (9), Pology Yanenky, 22.08.1953, 2 mature specimens, stained whole-mounts (2 slides).

Description (fig. 35–40; for some measurements see tab. 6). Strobila band-like, with strong musculature and maximum width at gravid proglottides. Scolex (fig. 35) round, with maximum width at level just posterior to suckers. Suckers round, muscular, unarmed. Rostellum conical, with well-developed musculature; intensely stained cells present in it. Rostellar sheath sac-like, with weakly-developed musculature of walls; intensely stained glandular masses and four retractor muscles present in it. Rostellum provided with crown of 10 hooks. Each hook (fig. 36) with almost diorchoid refractive particle and epiphyseal thickening of both handle and guard. Measurements of rostellar hooks: length of refractive particle 42–44 (43, n=4), length of blade 17–19 (18, n=4), length of base 36 (n=4). Proglottides (fig. 37–39) craspedote, with well expressed velum, much wider than long in every stage of development. Genital pores unilateral, open in anterior 1/3–1/2 of lateral proglottis margin. Genital atrium (fig. 37–40) very deep, cylindrical or slightly funnel-shaped; its bottom surrounded by intensely stained cells. Ventral and dorsal osmoregulatory canals without transverse anastomoses; diameter of dorsal osmoregulatory canals 8–13 (10, n=20), diameter of ventral osmoregulatory canals 34–62 (50, n=20). Genital ducts dorsal to osmoregulatory canals.

Testes (fig. 37) three, compact, elliptical; situated usually in one row, rarely in flattened triangle. External seminal vesicle (fig. 37–40) elliptical or oval, connected

Table 6. Metrical data for *Confluaria krabbei* from *Tachybaptus ruficollis*Таблица 6. Метрические данные *Confluaria krabbei* от *Tachybaptus ruficollis*

Metrical data, μm		Kaliningrad (Vasileva et al., 1999 b)			Ukraine (Present study)		
		1	2	3	1	2	3
Strobila:	length, mm	54	-	1	44-82	-	2
	width, mm	0.5	-	1	1.1-1.2	-	2
Scolex:	length	238	-	1	334-354	-	2
	width	302	-	1	289-296	-	2
Suckers:	diameter	82-88	85	4	100-108	104	8
Rostellum:	length	134	-	1	186-193	-	2
	width	88	-	1	95-111	-	2
Rostellar sheath:	length	198	-	1	232-264	-	2
	width	116	-	1	147-160	-	2
Rostellar hooks:	total length	49-50	-	2	47-49	48	4
Testes:	length	-	-	-	54-72	64	20
	width	34-39	37	20	31-44	37	20
Cirrus-sac:	length	180-225	197	10	231-302	266	20
	width	32-45	39	10	51-64	58	20
Ratio L_{CS}/W_P		0.36-0.47	0.41	10	0.28-0.39	0.34	20
Evaginated cirrus:	length	95-129	114	10	162-188	173	20
	width	13-15	14	10	15-18	17	20
External seminal vesicle:	length	52-77	60	10	98-129	114	20
	width	39-59	44	10	59-80	68	20
Vitellarium:	length	31-39	35	10	52-70	59	20
	width	23-26	25	10	26-36	31	20
Seminal receptacle:	length	36-54	45	10	95-121	110	20
	width	21-34	26	10	31-52	41	20
Copulatory vagina:	length	116-134	127	10	157-174	166	20
	width	8-10	9	10	8-10	9	20

1 — range; 2 — mean; 3 — quantity.

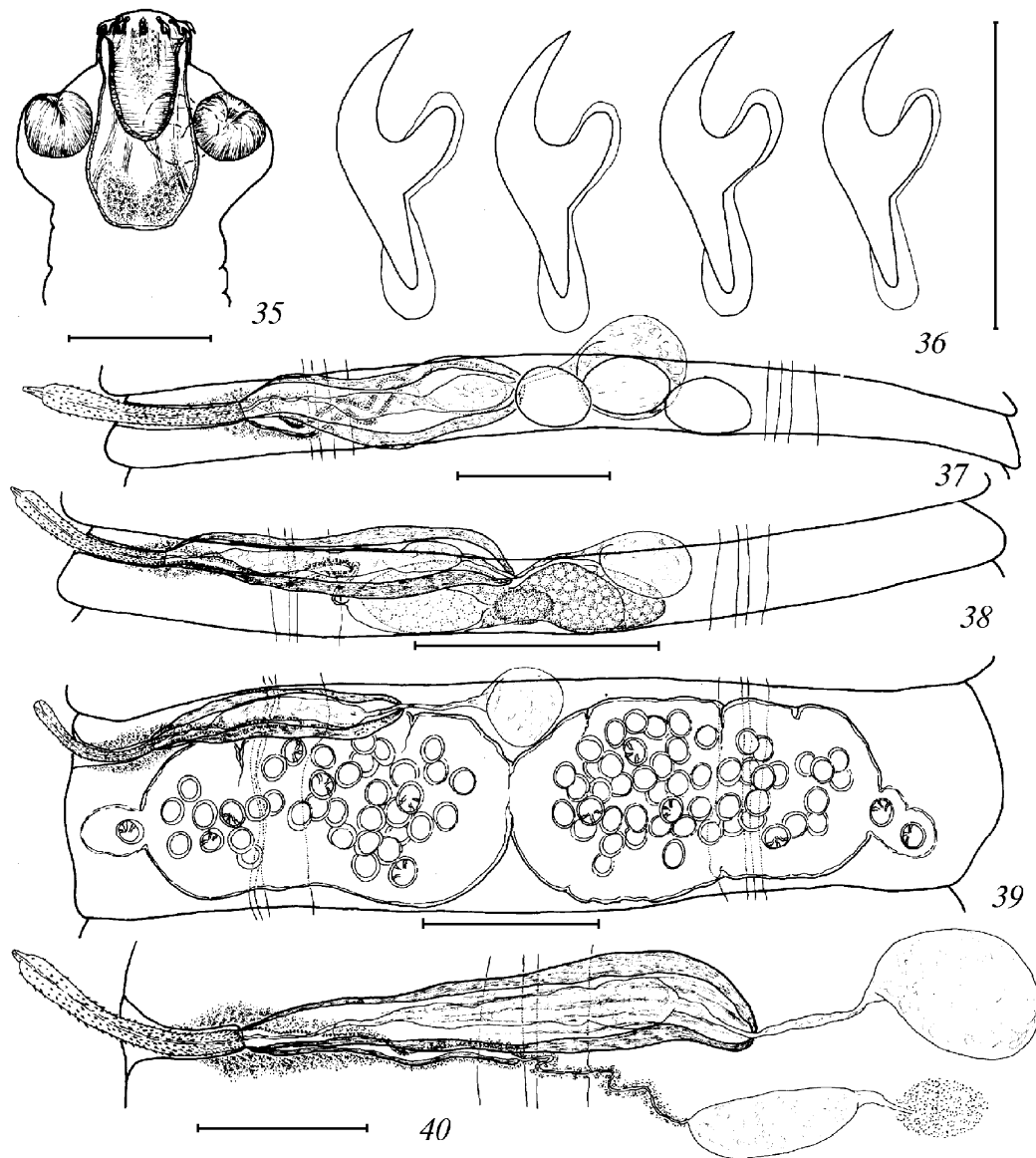


Fig. 35–40. *Confluaria krabbei*, specimens from *T. ruficollis*: 35 — scolex; 36 — rostellar hooks; 37 — male mature proglottis; 38 — hermaphroditic mature proglottis; 39 — gravid proglottis; 40 — terminal genital ducts. Scale-bars: 35, 38, 39 — 200 μm ; 37, 40 — 100 μm ; 36 — 50 μm .

Рис. 35–40. *Confluaria krabbei*, экземпляры от *T. ruficollis*: 35 — сколекс; 36 — крючья хоботка; 37 — мужской членик; 38 — гермафродитные членики; 39 — зрелый членик; 40 — концевые участки половых протоков. Масштабная линейка: 35, 38, 39 — 200 мкм; 37, 40 — 100 мкм; 36 — 50 мкм.

with cirrus-sac by long isthmus. Cirrus-sac (fig. 37–40) elongate, with thick muscular walls; never reaching mid-line of proglottis. Internal seminal vesicle elongate, occupying 1/2–1/3 of cirrus-sac. Evaginated cirrus (fig. 37–40) cylindrical, distally enlarged, armed with sparse, rosethorn-shaped spines on distal portion and dense, fine spines at basal portion. Fully-evaginated cirrus (fig. 37, 38, 40) terminating with conical unarmed tip with length 13–21 (16, $n=20$) and maximum width 8 ($n=20$).

Vitellarium (fig. 38) compact, elliptical, median. Ovary (fig. 38) median, with three transversely elongate lobes. Seminal receptacle (fig. 38, 40) elliptical, situated dorsally to ovary. Copulatory vagina (fig. 40) well-differentiated, tubular, thick-walled; poral part surrounded by thick sleeve of intensely stained cells; antiporal part sur-

rounded by thin cellular cover; copulatory vagina opening and passing ventrally or postero-ventrally to cirrus-sac; length of copulatory vagina is more than 1/2 of length of cirrus-sac at all developmental stages. Ratio L_V/L_{CS} 0.58–0.75 (0.67, n=20) for “male” mature proglottides, 0.56–0.75 (0.64, n=20) for hermaphroditic mature proglottides and 0.58–0.76 (0.65, n=20) for pregravid and gravid proglottides. Conductive part of vagina (fig. 40) thin, surrounded by intensely stained cells.

Uterus (fig. 39) sac-like, usually divided into two transversely elongate lobes; uterus crossing osmoregulatory canals dorsally to them. Gravid uterus (fig. 39) fills entire proglottis. Eggs with thin-walled outer shell; embryophore oval or elliptical, with diameter 31–39 (34, n=10); oncosphere round, with diameter 26–28 (27, n=10); length of embryonic hooks 10–13 (10, n=10).

Remarks. Vasileva et al. (1999 b) revealed that there are three species of *Confluaria* with similar shape of rostellar hooks (resembling diorchoid) parasitising *Tachybaptus ruficollis* in the Palaearctic: *C. multistriata*, *C. japonica* (Yamaguti, 1935) and *Confluaria* sp. The latter was described on the basis of a single specimen from *T. ruficollis* from Koenigsberg (now Kaliningrad, Russia) from Krabbe's Collection. In the present study, we found three further specimens from *T. ruficollis* which had similar characters.

Confluaria krabbei sp. n. resembles *C. multistriata* and *C. japonica*. It is close to *C. japonica* in the shape and structure of the rostellar hook (with an epiphyseal thickening of both handle and guard), the thick-walled and relatively short cirrus-sac which does not reach the mid-line of the proglottis and by the long isthmus connecting the external seminal vesicle and the cirrus-sac. However, the length of the hooks in the new species is 47–49 μm whilst in *C. japonica* it is 38–40 μm (Vasileva et al., 1999 b). In addition, *C. japonica* has a thick-walled, almost pear-shaped cirrus-sac with an enlarged middle part, composed of strong longitudinal muscular fibres (Vasileva et al., 1999 b); in contrast, in *C. krabbei*, the cirrus-sac is elongate and the muscular fibres of its walls are not clearly distinct.

C. krabbei is similar to *C. multistriata* in the length of the hooks, the shape of the evaginated cirrus and the shape of the cirrus-sac. However, the two species differ in the length of the cirrus-sac. The ratio L_{CS}/W_P is av. 0.24–0.39 in *C. krabbei* instead of av. 0.42–0.71 in *C. multistriata* (present study). The ratios L_V/L_{CS} are also different in the two species. In *C. krabbei*, the ratio L_V/L_{CS} is 0.56–0.76 (0.65, n=60) whilst it is 0.44–0.52 (0.48, n=60) in *C. multistriata*. In addition, the evaginated cirrus of *C. krabbei* terminates with very well-expressed unarmed conical portion whilst, in *C. multistriata*, this part of the cirrus is considerably shorter (fig. 31–33, 37, 38, 40). On the basis of the differences mentioned, we recognise the specimens described above as a new species.

The specimens of *C. krabbei* from Ukraine differ slightly from the specimen from Krabbe's Collection (Vasileva et al., 1999 b) in some metrical characters as length of the cirrus-sac, length of the cirrus, lengths of the external seminal vesicle and the seminal receptacle (tab. 6). These differences are within the scope of the intraspecific variability of hymenolepidid cestodes.

Conclusion

The results of the re-examination of cestodes of grebes from Ukraine (Vasileva et al., 2001; present study) demonstrate that these birds are hosts of hymenolepidid species of three genera: 2 species of *Dollfusilepis* (including one new species), one species of *Parafimbriaria* and 6 species of *Confluaria* (including one new species). All these cestodes are specific parasites of the Podicipedidae.

The recent faunistic survey of the cestodes from grebes from the Bulgarian Black Sea coast (Vasileva et al., 1996 a; 1996 b; 1998; 1999 a; 1999 b; 2000; Vasileva, Georgiev, 1999) recorded 12 species of the family Hymenolepididae. These were 9 species of specific grebe parasites and 3 species typically parasitising other aquatic birds. Species of the latter group were not found in Ukrainian grebes in the course of the present study. In addition, species of two other genera which include specific parasites of grebes and have been recorded at the Bulgarian Black Sea coast, *Mackoja* Kornyushin, 1983 and *Pararetinometra* Stock & Holmes, 1981, were not found yet in Ukrainian grebes.

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