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Revista Mexicana de Biodiversidad

Revista Mexicana de Biodiversidad 86 (2015) 888–895

Instituto de Biología UNAM
www.ib.unam.mx/revista/

Taxonomy and systematics

Redescription of *Tanaisia dubia* (Digenea) from the northeast region of Argentina, with a key to Neotropical species of the genus, and a key to genera of Tanaisiinae

Redescripción de Tanaisia dubia *(Digenea) en la región nordeste de Argentina, con una clave de las especies neotropicales del género y una clave de los géneros de Tanaisiinae*

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Received 14 January 2015; accepted 12 June 2015
Available online 11 November 2015

Abstract

Tanaisia dubia Freitas, 1951 (Digenea: Eucotylidae) is redescribed on the basis of specimens collected from the urinary tubules of the White-backed Stilt *Himantopus melanurus* (Charadriiformes: Recurvirostridae), and the Great Kiskadee *Pitangus sulphuratus* (Passeriformes: Tyrannidae), from Argentina. The specimens studied here are consistent with the original description, which was based on 1 specimen found parasitizing the Gray Yellowlegs *Tringa melanoleuca* (Charadriiformes, Scolopacidae), from Brazil. This redescription adds new morphological characters and enlarges the range of morphometric data for this species. A key to the genera of Tanaisiinae, as well as one for Neotropical species of *Tanaisia* Skrjabin, 1924 are presented. The diagnosis of Tanaisiinae is emended to include the presence of a cirrus sac. *T. dubia* is reported for the first time in Argentina and *H. melanurus* and *P. sulphuratus* represent new host records.
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Keywords: Eucotylidae; *Himantopus melanurus*; Recurvirostridae; *Pitangus sulphuratus*; Tyrannidae

Resumen

Tanaisia dubia Freitas, 1951 (Digenea: Eucotylidae) es redescrita a partir de ejemplares encontrados en los túbulos urinarios del tero real *Himantopus melanurus* (Charadriiformes: Recurvirostridae) y del benteveo *Pitangus sulphuratus* (Passeriformes: Tyrannidae) de Argentina. Los especímenes aquí estudiados corresponden con la descripción original, basada en un ejemplar hallado parasitando al pitotoy grande *Tringa melanoleuca* (Charadriiformes, Scolopacidae), de Brasil. Esta redescripción aporta nuevos caracteres morfológicos y amplía el intervalo de valores morfométricos para esta especie. Se presenta una clave para la identificación de los géneros de Tanaisiinae y otra para las especies neotropicales del género *Tanaisia* Skrjabin, 1924. La descripción de Tanaisiinae es enmendada para incluir la presencia del saco del cirro. *Tanaisia dubia* se registra por primera vez para Argentina parasitando 2 especies hospedadoras nuevas, *H. melanurus* y *P. sulphuratus*.
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Palabras clave: Eucotylidae; *Himantopus melanurus*; Recurvirostridae; *Pitangus sulphuratus*; Tyrannidae

Introduction

The White-backed Stilt, *Himantopus melanurus* Vieillot (Charadriiformes: Recurvirostridae) – also considered as *Himantopus mexicanus melanurus* (Remsen et al., 2014) – inhabits marshes, shallow lakes and ponds and is widely distributed in South America, being a well-studied

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Peer Review under the responsibility of Universidad Nacional Autónoma de México.

http://dx.doi.org/10.1016/j.rmb.2015.06.012
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species in Argentina. At present, the records for helminth parasites of the White-backed Stilt from South America are represented by *Microphallus simillimus* (Travassos, 1920), *Microphallus szidati* Martorelli, 1986, *Levinseniella cruzi* Travassos, 1920 (Microphallidae); *Psilochasmus oxyurus* (Creplin, 1825) (Psilostomidae); *Pygidiopsis crassus* Ostrowski-de Núñez, 1995, *Ascocotyle* (*Ascocotyle*) *felippei* Travassos, 1928 (Heterophyidae), *Profilicollis chasmagnathi* (Holcman-Spector, Mane-Garzón, & Dei-Cas, 1977) (as *Falsifilicollis ch.*) (Polymorphidae) and *Davainea himantopodis* Johnston, 1911 (Davaineidae) in Argentina; *Stomylotrema bijugum* Braun, 1901 (Stomylotrematidae) and *Tanaisia valida* Freitas, 1951 (Eucotylidae) in Brazil; *Microsomacanthus kaulobatroni* Deblock and Vaucher, 1997, and *Wardium neotropicale* Deblock and Vaucher, 1997 (Hymenolepididae) in Paraguay (Alda, Martorelli, & Sarria, 2011; Deblock & Vaucher, 1997; Martorelli, 1986, 1988, 1989, 1991; Martorelli & Ivanov, 1996; Tanzola, 1989; Travassos, Freitas, & Kohn, 1969). The Great Kiskadee, *Pitangus sulphuratus* (L.) (Passeriformes: Tyrannidae), inhabits open woodlands and is widely distributed in the American continent. The records of parasites for this bird are represented by *Neodiplostomum branchiocystis* (Lutz, 1928) Dubois, 1937 (Diplostomidae) and *Stephanoprora pitangui* (Lutz, 1924) (Echinostomatidae) from Brazil and Venezuela; *Echinochasmus sulphuratus* (Nasir & Diaz, 1973) in Venezuela; *Echinochasmus everardi* (Rutledge, Schmidt, & Tikasingh, 1977) (Echinostomatidae) in Trinidad; *Posthodiplostomum nanum* Dubois, 1937 (experimental host), *Lophosicyadiplostomum nephrocystis* (Lutz, 1928) (Diplostomidae), *Gynaecotyla adunca* (Linton, 1905) (Microphallidae), *Diplotriaena delirae* Pinto and Noronha, 1970 (Diplotriaenidae), *Skrjabinoclava tupacincai* Freitas, Vicente, and Ibáñez, 1970, *Deliria gomesae* Vicente, Pinto, and Noronha, 1980, *Dispharynx nasuta* (Rudolphi, 1819) (Acuariidae), *Thelazia* sp. (Thelaziidae), *Biuterina campanuiata* (Rudolphi, 1819) (Dilepididae) in Brazil; *Neodiplostomum fastigatum* Dubois, 1985 and *Conodiplostomum pitangi* (Dubois, 1985) (Diplostomidae) in Paraguay; *Austrodiplostomum mordax* Szidat and Nani, 1951 (experimental host) (Diplostomidae), and *Echinochasmus talaensis* Martorelli, 1985 (Echinostomatidae) from Argentina (Caballero & Díaz-Ungría, 1958; Dubois, 1970, 1985; Martorelli, 1985; Moura Mendes, Mascarenhas, & Müller, 2011; Muniz-Pereira, Arruda, & Pinto, 2004; Nasir & Diaz, 1973; Noronha, Sá, Knoff, Muniz-Pereira, & Pinto, 2009; Ostrowski-de Núñez, 1968; Rutledge et al., 1977; Travassos et al., 1969; Vicente, Pinto, & Noronha, 1983a, 1983b).

The aim of this paper is to redescribe *Tanaisia dubia* Freitas, 1951 (Eucotylidae) harbored by *H. melanurus* and *P. sulphuratus*, and to propose a key to the genera of Tanaisiinae Freitas, 1951 and another one for the Neotropical species of *Tanaisia* Skrjabin, 1924.

Materials and methods

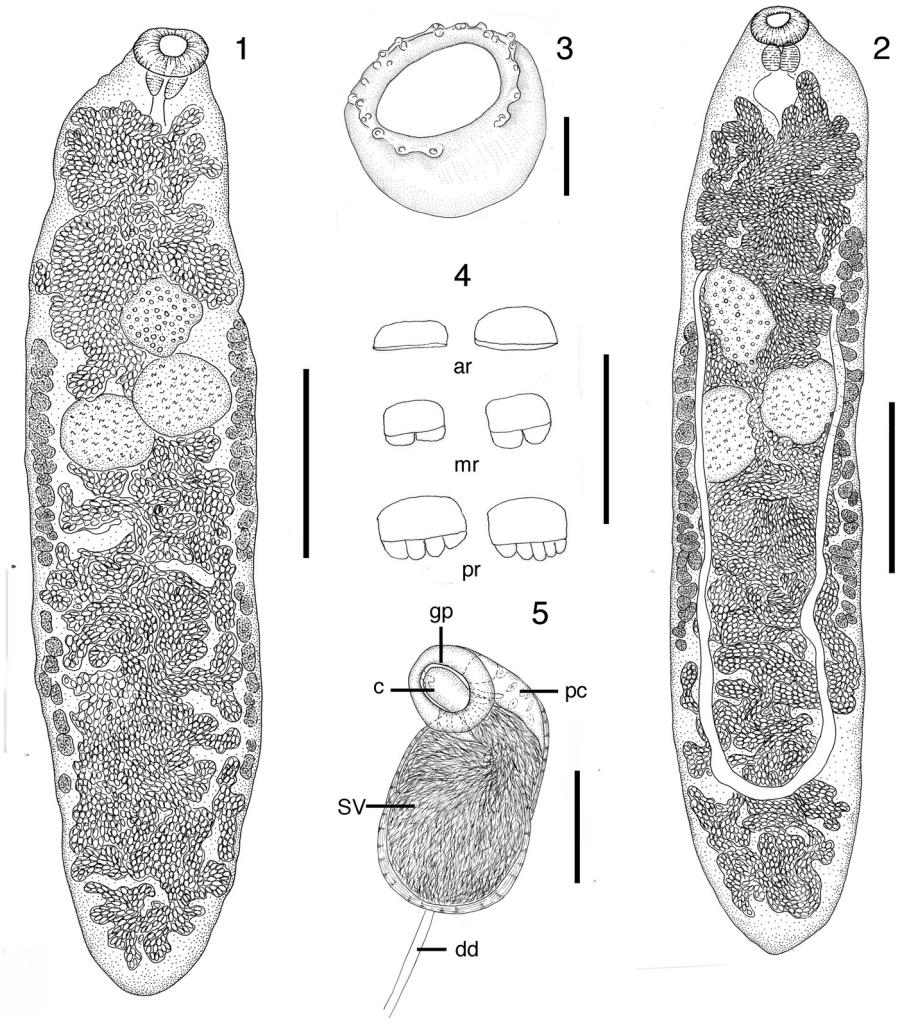
A single specimen of the White-backed Stilt and another of the Great Kiskadee were captured on August 2013 in La Marcela farm (26°17′35″S, 59°08′38″W), Pirané, Formosa Province, Argentina; with authorization of Ministerio de la Producción, Dirección de Fauna y Parques of Formosa Province. The birds were dissected in the field and their viscera analyzed immediately after capture. Digeneans were removed alive, fixed in hot 5% formalin; some specimens were stained with hydrochloric carmine and mounted in Canada balsam, and others studied in temporary mounts in water, unstained. Drawings were made with the aid of a drawing tube. Measurements are given in micrometers (μm) unless otherwise stated, as well as the range followed by the mean in parentheses. The helminths were deposited in the Helminthological Collections of the Museo de La Plata (MLP) and the birds deposited at the Ornithological Collection of the Museo de La Plata (MLP), Argentina. The abbreviations of the metrical features are as follows: Atl, anterior testis length; Atw, anterior testis width; Bl, body length; Bw, body width; Cs, cirrus sac; El, eggs length; Ew, eggs width; Esl, esophagus length; Lpvf, left post-vitelline field; Lv, left vitellarium; Ol, ovary length; Osl, oral sucker length; Osw, oral sucker width; Ow, ovary width; Phl, pharynx length; Phw, pharynx width; Ptl, posterior testis length; Ptw, posterior testis width; Rpvf, right post-vitelline field; Rv, right vitellarium; T, tegument; Vs, ventral sucker.

Redescription

Tanaisia dubia *Freitas, 1951 (Figs. 1–5)*

Diagnosis based on 12 specimens

Body elongate, flattened, 1.2–2.9 mm (2.5 mm) long by 338–657 (528) wide. Tegument with scales throughout entire length of body, clearly visible in temporary preparations; ventral scales in anterior region without teeth; ventral scales in median and posterior regions with 2–5 blunt teeth per scale, exceptionally with 6 blunt teeth. Tegumentary scales 7–13 (9) long by 15–20 (17) wide. Oral sucker subterminal, 107–145 (123) long by 131–193 (167) wide. Oral sucker surface with tegumentary papillae disposed in 1 row of 7 papillae on the ventral surface and 10 pairs in the latero-dorsal surface; these papillae are clearly visible in temporary preparations. Ventral sucker absent. Prepharynx lacking; pharynx 62–97 (64) long by 69–111 (98) wide; esophagus short, 77–106 (87) long, caeca united posteriorly forming cyclocoel. Genital pore median, preovarian, genital atrium large. Cirrus sac small, globular, well developed, with muscular wall, 97 × 68; contains seminal vesicle, prostatic cells large, and small cirrus. Testes globular, diagonal, close together, intercaecal, in second fourth of body; anterior testis 107–309 (246) long by 143–338 (237) wide; posterior testis 140–328 (246) long by 119–386 (248) wide. Ovary, intercecal, pretesticular, submedian, on left side of anterior testis, lobed, 121–300 (228) long by 131–319 (233) wide. Seminal receptacle and Mehlis gland, immediately posterior to ovary. Vitellaria follicular, in 2 lateral symmetrical longitudinal bands, asymmetric exceptionally, extending from the level of ovarian region to the third quarter of the body; right vitelline field 0.6–1.4 mm (1.1 mm) long, ending at 208–851 (584) from posterior end of body; left vitelline field 0.5–1.3 mm (1.0 mm) long, terminating at 280–991 (742) from posterior end of body. Uterus highly



Figures 1–5. *Tanaisia dubia* from *Himantopus melanurus*. (1) Specimens with vitelline follicles disposed in 2 symmetrical bands, dorsal view, scale bar = 500 μm. (2) Specimen with vitelline follicles in 2 asymmetrical bands, ventral view, scale bar = 500 μm. (3) Oral sucker with tegumentary papillae, scale bar = 50 μm. (4) Tegumental scales, scale bar = 20 μm. (5) Cirrus sac, scale bar = 50 μm. ar, scales from anterior region without teeth; c, cirrus; dd, deferent duct; gp, genital pore; mr, scales from midregion with 2 blunt teeth; pc, prostatic cells; pr, scales from posterior region with 4–5 blunt teeth; sv, seminal vesicle.

convoluted; descending uterus crosses the intertesticular field and reaches the posterior region of body; ascending uterus passes through the intertesticular field, overlapping with the descending limb, and fills almost the entire pretesticular region. Metraterm opens into the genital atrium, laterally to the cirrus sac. Mature eggs smooth, dark brown, 26–38 × 14–19 (33 × 17). Excretory vesicle not seen. Excretory pore dorso-subterminal.

Taxonomic summary

Hosts: *H. melanurus* Vieillot (Charadriiformes, Recurvirostridae), *P. sulphuratus* (L.) (Passeriformes, Tyrannidae)

Locality: La Marcela farm (26°17′35″S, 59°08′38″W), Pirané, Formosa Province, Argentina.

Date of collection: 30 August 2013.

Site of infection: ureters.

Intensity of infection: *H. melanurus*: 91 specimens from only 1 host captured; *P. sulphuratus*: 10 specimens from only 1 host captured.

Specimens deposited: MLP-He 6771: 7 specimens whole mounted and 51 in 70% ethanol from *H. melanurus*; MLP-He 6672: 10 specimens whole mounted from *P. sulphuratus*.

Remarks

The genus *Tanaisia* comprises a large group of Digenea parasitic in urinary tubules of birds from different biogeographical regions. The *Tanaisia* spp. possess a fairly uniform morphology and are hardly distinguishable from each other. Freitas (1951) considered the presence of spines or scales, as well as their shape, an important specific diagnostic character; Odening (1963) extended this concept for all eucotylid species, however, Rietschel and Werding (1978) observed that in *T. valida* the scales shape seem to be of little taxonomic value. The specimens described here share the presence of scaly tegument with 11 species reported in the Neotropical region: *T. dubia*, *Tanaisia exigua* Freitas, 1951, *Tanaisia incerta* Freitas, 1951, *Tanaisia inopina* Freitas, 1951, *Tanaisia magnicolica* Freitas, 1951, *Tanaisia minax* Freitas, 1951, *Tanaisia oviaspera* Freitas, 1951, *Tanaisia parva* Freitas, 1951, *Tanaisia similis* Freitas, 1951, *T. valida* and *Tanaisia angusta* Franco, 1965. All of these species have similar morphometric characters (Table 1); however, the specimens collected in the White-backed Stilt and the Great Kiskadee possess morphological and morphometric

Table 1
Measurements of Neotropical species of *Tanaisia* with scaly tegument.

Species	*Tanaisia dubia*		*Tanaisia incerta*	*Tanaisia inopina*		*Tanaisia magnicolica*	*Tanaisia oviaspera*	*Tanaisia minax*
Source	Present study	Freitas (1951)	Freitas (1951)	Freitas (1951)	Freitas (1959)	Freitas (1951)	Freitas (1951)	Freitas (1951)
Bl (mm)	1.2–2.9	1.54	2.28–3.22	1.51–2.04	2.28–3.28	1.09–3.82	2.51–3.01	2.18–3.68
Bw	338–657	390	620–770	400–550	570–740	280–830	490–750	540–870
T	Scaly	Scaly	Scaly	Scaly	Scaly	Scaly	Scaly	Scaly
Osl	107–145	130	180–280	160–220	220–250	120–300	170–200	180–280
Osw	131–193	170	180–310	170–250	250–310	130–330	190–220	250–330
Vs	Absent	Not seen	29–34	Not seen	Not seen	20–40 × 20–50	Not seen	70–100
Phl	62–97	94	80–100	60–80	80–100	40–100	80–100	70–100
Phw	69–111	99–118	100–130	80–100	80–120	50–120	100–120	100–150
Esl	77–106	–	–	–	–	–	–	–
Cs	97 × 68	–	–	–	–	–	–	–
Ol	121–300	110	130–180	150–190	130–300	90–360	160–220	140–300
Ow	131–319	200	170–320	140–280	120–310	120–360	210–260	170–290
Atl	107–309	140	130–220	130–220	170–310	80–360	130–230	190–330
Atw	143–338	160	160–260	130–170	150–270	90–390	140–270	80–260
Ptl	140–328	150	120–260	130–170	180–370	70–330	150–230	130–370
Ptw	119–386	140	130–190	110–230	130–300	80–300	160–300	70–220
Rv (mm)	0.6–1.4	0.6	0.7–1.24	0.5–1.0	0.65–1.1	0.37–1.51	0.8–1.27	0.65–1.34
Rpvf (mm)	0.21–0.85	0.3	0.6–1.06	0.36–0.46	0.4–1.0	0.33–1.24	0.57–1.0	0.53–1.31
Lv (mm)	0.5–1.3	0.67	0.83–1.33	0.6–0.83	0.77–1.17	0.37–1.61	0.94–1.31	0.75–1.49
Lpvf (mm)	0.28–0.99	0.4	0.68–1.08	0.33–0.48	0.3–1.04	0.33–1.27	0.57–0.9	0.93–1.08
El	26–38	35–42	34–40	34–38	34–38	30–42	34–35	44–52
Ew	14–19	13–15	20–23	14–16	16–17	13–19	16–19	21–27

Species	*Tanaisia similis*	*Tanaisia valida*			*Tanaisia parva*	*Tanaisia exigua*	*Tanaisia angusta*
Source	Freitas (1951)	Freitas (1951)	Ibañez-Herrera (1965)	Rietschel and Werding (1978)	Freitas (1951)	Freitas (1951)	Franco (1965)
Bl (mm)	1.57–1.94	3.11–3.45	2.67–4	3.3–3.8	3.62	2.95	3.93
Bw	540–600	890–940	600–780	705–780	770	430	670
T	Scaly	Scaly	–	Scaly	Scaly	Scaly	Scaly
Osl	100–200	180–230	133–233	169–235	220	220	180
Osw	200–250	200–250	180–280	195–282	230		200
Vs	Not seen	Not seen	Not seen	Not seen	Not seen	Not seen	Not seen
Phl	70–100	50–80	65–100	94	80	80	80
Phw	80–100	80–90	100–120	99–118	90	100	90
Esl	–	–	–	–		–	–
Cs	–	–	67–133 × 47–80	–	–	–	–
Ol	130–200	200–270	150–333	210–329	360	280	270
Ow	160–230	230–310	167–233	306–329	410	220	380
Atl	130–200	170–280	200–333	282–235	360	160	160
Atw	140–220	250–310	217–333	235–329	350	130	90
Ptl	130–230	230–280	183–367	235–282	420	110	100
Ptw	160–210	220–300	167–250	259–329	260	130	110
Rv (mm)	0.56–0.8	1.47–1.74	1.33–2.03	–	1.51	0.86	2.08
Rpvf (mm)	0.5–0.53	0.6–0.9	0.8–1.2	–	1.07	1.13	0.67
Lv (mm)	0.66–0.75	1.44–1.91	1.07–1.47	–	–	0.86	3.26
Lpvf (mm)	0.56	0.54–0.74	1.07–1.71	–	–	1.13	0.41
El	34–36	31–34	33	31–34	31–38	34–38	33
Ew	17–18	13–17	14	11–13	17–19	14–15	13–15

features similar to the specimen described by Freitas (1951) as *T. dubia*. The description of this species was based on 1 poorly preserved young specimen from the Greater Yellowlegs, *Tringa melanoleuca* (Gmelin) (Scolopacidae) from Zoological Garden of Rio de Janeiro, Brazil. The new morphometrical data, the presence of tegumentary papillae on the oral sucker surface, the confirmation of the absence of a ventral sucker (originally described as not visible), the morphological variation of the scales along the worm body, the conformation of the cirrus sac, and position of the excretory pore, make it possible to supplement the original description.

To date, only 2 species of *Tanaisia* has been reported in Argentina, *Tanaisia serrata* Szidat, 1961 found parasitizing the White-winged Coot, *Fulica leucoptera* Vieillot (Gruiformes: Rallidae) from Quequén River, Buenos Aires Province, and *Tanaisia fedtschenkoi* Skrjabin, 1924 in *Chroicocephalus maculipennis* (Lichtenstein) and *Chroicocephalus cirrocephalus* (Vieillot) from Mar del Plata, Buenos Aires Province

Table 2
List of definitive host species and country for Neotropical *Tanaisia* spp.

Species	Host family	Host species	Country	Reference
T. angusta	Rallidae	*Pardirallus maculatus maculatus*	Brazil	Franco (1965), Travassos et al. (1969)
T. dubia	Scolopacidae	*Tringa melanoleuca*	Brazil	Freitas (1951), Travassos et al. (1969)
	Recurvirostridae	*Himantopus melanurus*	Argentina	Present study
	Tyrannidae	*Pitangus sulphuratus*	Argentina	Present study
T. exigua	Troglodytidae	*Troglodytes musculus musculus*	Brazil	Freitas (1951), Travassos et al. (1969)
T. fedtschenkoi	Scolopacidae	*Tringa melanoleuca*	Venezuela	McNeil, Díaz, Casanova, and Villeneuve (1996)
	Laridae	*Chroicocephalus maculipennis*	Argentina	Labriola and Suriano (2001)
		Chroicocephalus cirrocephalus	Argentina	Labriola and Suriano (2001)
T. freitasi	Icteridae	*Psarocolius montezuma*	Costa Rica	Brenes and Arroyo (1962); Rodríguez-Ortíz, García-Prieto, and Pérez-Ponce de León (2004)
T. incerta	Emberizidae	*Ammodramus humeralis humeralis*	Brazil	Freitas (1951)
T. inopina	Passeridae	*Passer domesticus*	Brazil	Freitas (1951); Brasil and Amato (1992)
	Turdidae	*Turdus rufiventris*	Brazil	Calegaro-Marques and Amato (2010)
	Laridae	*Sterna* sp.	Brazil	Freitas (1951, 1959)
	Icteridae	*Icterus chrysocephalus*	Brazil	Franco (1965)
	Phasianidae	*Coturnix japonica*	Brazil	Pinto, Menezes, and Tortelly (2005)
	Columbidae	*Columba livia*	Brazil	D'ávila, Manso, Bessa, Rodrigues, and Días (2010)
T. magnicolica	Cuculidae	*Guira guira*	Brazil	Freitas (1951)
	Emberizidae	*Paroaria capitata*	Brazil	Freitas (1951)
	Columbidae	*Columbina talpacoti talpacoti*	Brazil	Queiróz (1966); Travassos et al. (1969)
		Psophia viridis obscura	Brazil	Muniz-Pereira, Vieira, and Luque (2009)
T. minax	Corvidae	*Cyanocorax cyanomelas*	Brazil	Freitas (1951)
	Passeridae	*Cyanocorax chysops*	Brazil	Freitas (1951)
		Passer domesticus	Brazil	Freitas (1951)
T. oviaspera	Thraupidae	*Ramphocelus c. connectens*	Brazil	Freitas (1951)
	Icteridae	*Ramphocelus carbo carbo*	Brazil	Freitas (1951)
	Emberizidae	*Thraupis sayaca sayaca*	Brazil	Freitas (1951)
		Tangara seledon	Brazil	Odening (1963)
		Dacnis cayana	Brazil	Odening (1970)
		Icterus pyrrhopterus	Brazil	Freitas (1951)
		Paroaria coronata	Brazil	Mascarenhas, Krüger, and Müller (2009)
T. parva	Corvidae	*Cyanocorax cristatellus*	Brazil	Freitas (1951), Travassos et al. (1969)
T. precaria	Strigidae	*Speotyto cunicularia grallaria*	Brazil	Freitas (1951), Travassos et al. (1969)
T. serrata	Rallidae	*Fulica leucoptera*	Argentina	Szidat, 1961
T. similis	Corvidae	*Cyanocorax chysops*	Brazil	Freitas (1951)
T. valida	Recurvirostridae	*Himantopus melanurus*	Brazil, Perú	Freitas (1951), Ibañez-Herrera (1965,1998)
	Scolopacidae	*Phalaropus tricolor*	Perú	Tantalean, Sarmiento, and Huiza (1992)
	Emberizidae	*Paroaria coronata*	Brazil	Ibañez-Herrera (1965); Tantalean et al. (1992)
	Charadriidae	*Charadrius wilsonia*	Colombia	Mascarenhas et al. (2009), Rietschel and Werding (1978)
T. winteri	Jacanidae	*Jacana spinosa spinosa*	Costa Rica	Brenes and Arroyo (1962); Rodríguez-Ortíz et al. (2004)

(Labriola & Suriano, 2001; Szidat, 1961). The present finding represents the first record of *T. dubia* since its original description and the first for Argentina, and *H. melanurus* and *P. sulphuratus* constitute new hosts records for this species.

Discussion

Freitas (1951) erected the subfamily Tanaisiinae and described 13 species of Tanaisia found parasitizing Neotropical birds. According to Freitas (1959) and Kanev, Radev, and Fried (2002) only 11 remain as valid species. Later, another 4 species were described in the Neotropical region: *T. serrata* from Argentina, *Tanaisia winteri* Brenes and Arroyo, 1962 and *Tanaisia freitasi* Brenes and Arroyo, 1962 from Costa Rica, and *T. angusta* from Brazil (Brenes & Arroyo, 1962; Franco, 1965; Szidat, 1961). Odening (1963) described a new species, *Tanaisia freitasiana* Odening, 1963, which was later synonymized with *T. oviaspera* by Odening (1970). Freitas (1951) and Odening (1963) highlighted the need of a detailed study of the tegument for identification of the eucotylid species. The tegument of this species may have comb-like scales or simple spines; which rarely may be absent, or only vestigial in older specimens.

The diagnosis of *Tanaisia* given by Freitas (1951) includes species with testes in tandem, diagonal or symmetrical, which were described as "*testículos na mesma zona ou em zonas que coincidem parcialmente*, *ou*, *ainda*, *no mesmo campo*". Kanev et al. (2002) characterize this genus with testes in tandem or diagonal to differentiate it from the other members of the subfamily with similar organization, but with symmetrical testes: *Paratanaisia* Freitas, 1959 and *Tamerlania* Skrjabin, 1924. Moreover, these genera differ primarily in the extension of vitelline fields; *Tanaisia* with vitelline fields only in postovarian region, *Paratanaisia* with vitelline fields extending in both preovarian and postovarian regions, and *Tamerlania* with vitelline fields restricted to post-testicular region.

Key to genera Tanaisiinae Freitas, 1951.

1a Vitelline fields extending both in pre- and post-testicular region.	*Paratanaisia* Freitas, 1959
1b Vitelline fields from ovarian or post-testicular region.	2
2a Vitelline fields from ovarian or testicular regions.	*Tanaisia* Skrjabin, 1924
2b Vitelline fields restricted to post-testicular region.	*Tamerlania* Skrjabin, 1924

Tamerlania was synonymized with *Tanaisia* by Freitas (1951, 1959), considered as subgenus of *Tanaisia* by Yamaguti (1958, 1971) and recognized as valid genus by Kanev et al. (2002). We have analyzed the descriptions and drawings of the species described by Freitas (1951), Brenes and Arroyo (1962) and Franco (1965), and observed that 10 Neotropical species exhibit intermediate characters between *Tanaisia* and *Tamerlania*, possessing testes symmetrical, irregular in shape or slightly lobed, and vitelline fields not restricted to post-testicular region. We believe that the most important morphological feature to distinguish the 3 genus of Tanaisiinae is the extension of vitelline fields. For this reason, we propose the following key for the subfamily.

The results of this study indicate that *Tanaisia* should also include species with symmetrical testes and vitelline fields beginning at the ovarian or postovarian regions, and consequently should be retain the original names for *Tanaisia precaria* Freitas, 1951, *T. minax*, *T. magnicolica*, *T. incerta*, *T. oviaspera*, *T. inopina*, *T. similis*, *T. exigua*, *T. parva*, and *T. valida*. We provide a key to facilitate differentiation of the species of *Tanaisia*.

Key to species of *Tanaisia* Skrjabin, 1924 from Neotropical region.

1a Tegument spinous, ventral sucker present or not observed.	2
1b Tegument scaly, ventral sucker present, not observed, or absent.	6
2a Ventral sucker present.	3
2b Ventral sucker not observed.	4
3a Testes tandem.	*Tanaisia serrata*
3b Testes slightly diagonal.	*Tanaisia fedtschenkoi*
4a Testes not lobed, symmetrical.	*Tanaisia precaria*
4b Testes deeply lobed, diagonal or symmetrical.	5
5a Testes symmetrical.	*Tanaisia freitasi*
5b Testes diagonal.	*Tanaisia winteri*
6a Ventral sucker present.	7
6b Ventral sucker not observed or absent.	9
7a Testes extracaecal.	*Tanaisia minax*
7b Testes caecal and intercecal.	8
8a Ovary deeply lobed.	*Tanaisia magnicolica*
8b Ovary round or sinuous outline.	*Tanaisia incerta*
9a Ventral sucker absent. Testes diagonal, round. Ovary lobed.	*Tanaisia dubia*
9b Ventral sucker not observed. Testes diagonal or symmetrical.	10
10a Testes diagonal, lobulated.	11
10b Testes symmetrical.	12
11a Ovary lobulated, lateral.	*Tanaisia valida*
11b Ovary smooth, median, intercecal.	*Tanaisia angusta*
12a Eggs with rugged shell.	*Tanaisia oviaspera* syn. *T. freitasiana* Odening, 1963
12b Eggs with smooth shell.	13
13a Testes round or sinuous outline.	14
13b Testes lobed principally at the outer edge.	*Tanaisia inopina*
14a Ovary lobed at the outer edge.	*Tanaisia similis*
14b Ovary deeply lobed.	15
15a Vitelline fields beginning post-ovarian region.	*Tanaisia exigua*
15b Vitelline fields beginning ovarian region.	*Tanaisia parva*

A total of 16 species of *Tanaisia* parasitize Passeriformes, Charadriiformes, Strigiformes, Galliformes, Gruiformes, Cuculiformes, and Columbiformes from the Neotropical region (Table 2). Particularly, *T. dubia* was recovered in Charadriiformes (*T. melanoleuca* and *H. melanurus*) and Passeriformes (*P. sulphuratus*), only 1 specimen was found in *T. melanoleuca* by Freitas (1951), whereas in the present study 91 and 10 specimens were found in *H. melanurus* and *P. sulphuratus*, respectively. This could be related with the life cycles of parasites and the diet of birds. The life cycle of *T. dubia* is unknown; however, considering the life cycle pattern of Tanaisiinae, the birds could be infected by ingesting pulmonate gastropods infected with metacercariae. The diet of *H. melanurus* includes insects, bivalves, gastropods, oligochaetes, polychaetes, tadpoles and small fishes (del Hoyo, Elliot, & Sargatal, 1996); *P. sulphuratus* is an omnivorous bird, with a wide spectrum of prey, it feeds on seeds, fruits, insects, arachnids, crustaceans, gastropods, fishes, tadpoles and reptiles (Latino & Beltzer, 1999); *T. melanoleuca* primarily eats crustaceans, aquatic and terrestrial insects, worms and small fish (del Hoyo et al., 1996). Given that usually *T. melanoleuca* does not feed on snails, the presence of *T. dubia* in this bird could be accidental and more frequent in birds with a diet that includes snails.

Finally, we believe that the diagnosis of Tanaisiinae by Kanev et al. (2002) should be emended to include the presence of a cirrus sac, given that Freitas (1951) described its presence (reduced to seminal vesicle) for all eucotylid species, and is confirmed in the present paper.

Acknowledgements

The authors express their gratitude to Dr. Carlos Montoya for his help and hospitality during our stay in Formosa Province; to Luis Pagano (Sección Ornitología División Zoología Vertebrados, Museo de La Plata) for assistance in collecting and identification of bird hosts; to Gabriel Baloriani who made the drawings. The present study was funded by CIC (Res. No. 243/13) and UNLP (11/N603).

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