Journal of Helminthology

cambridge.org/jhl

A checklist of larval Digenea (Platyhelminthes: Trematoda) in molluscs from inland waters of Argentina: one hundred years of research

M.J. Merlo[1,2], M. Parietti[1,2], M.V. Fernández[3], V. Flores[4] and D. Davies[5]

[1]Laboratorio de Parasitología, Universidad Nacional de Mar del Plata (UNMDP), Mar del Plata, 7600, Buenos Aires, Argentina; [2]Instituto de Investigaciones en Producción Sanidad y Ambiente (CONICET-UNMDP), Consejo Nacional de Investigaciones Científicas y Técnicas, Mar del Plata, 7600, Buenos Aires, Argentina; [3]Centro de Ecología Aplicada del Litoral (CECOAL-CONICET), Consejo Nacional de Investigaciones Científicas y Técnicas, Ruta 5 Km 2.5, Corrientes, 3400, Argentina; [4]Instituto de Investigaciones en Biodiversidad y Medioambiente (Consejo Nacional de Investigaciones Científicas y Técnicas – Universidad Nacional del Comahue), Avenida Quintral 1250, San Carlos de Bariloche, 8400, Río Negro, Argentina and [5]Instituto para el Estudio de la Biodiversidad de Invertebrados, Facultad de Ciencias Naturales, Universidad Nacional de Salta, Avenida Bolivia 5150, Salta, 4400, Argentina

Research Paper

Cite this article: Merlo MJ, Parietti M, Fernández MV, Flores V, Davies D (2022). A checklist of larval Digenea (Platyhelminthes: Trematoda) in molluscs from inland waters of Argentina: one hundred years of research. *Journal of Helminthology* **96**, e32, 1–28. https://doi.org/10.1017/S0022149X2100081X

Received: 4 December 2021
Revised: 28 December 2021
Accepted: 28 December 2021

Key words:
Bivalves; gastropods; cercariae; trematodes; diversity

Author for correspondence:
M. Parietti,
E-mail: manuelaparietti@hotmail.com

Abstract

A checklist of larval digeneans parasitising molluscs from inland waters of Argentina is presented here. Based on the bibliographical survey of 113 scientific articles and nine theses published between 1930 and 2021, 213 digeneans were found, which were distributed within 13 superfamilies and 35 families. The parasites were identified in 102 locations, encompassing eight of the sixteen biogeographical provinces in Argentina. Digeneans were found in 34 mollusc species (31 gastropods and three bivalves) belonging to 17 genera. The available data are presented for each digenean species, and included host information, localities, prevalence values, type of habitat, life cycle information (natural or experimental host), and information on material and genetic sequences deposited in repositories. Only 21.1% of individuals were identified to species level, and 8.5% to genus level. In addition, the genetic sequences of only 10 species (4.7%) were available at GenBank. This survey constitutes the first checklist of parasitic helminths in molluscs from inland waters of Argentina.

Introduction

Argentina is the second largest country in South America, with a total area of approximately 2.7 million km². Due to its vast area and geographical location in the southernmost portion of South America, it presents a large diversity of habitats distributed in 16 biogeographical provinces (Arana *et al.*, 2021). Said diversity ranges from high mountainous environments to lowlands that include very varied continental ecosystems, from warm rainforests in the north to southern subantarctic forests in the south, and from dry deciduous forests to vast floodplains and deserts (Dos Santos *et al.*, 2020).

Environmental heterogeneity favours the development of a diverse fauna, as well as a great biodiversity of parasites with different life cycles, especially digeneans. Digeneans typically have complex life cycles that involve three hosts – ¤a definitive host (generally a vertebrate), a first intermediate host (mainly a mollusc), and a second intermediate host that can be an invertebrate (e.g., mollusc, annelid and crustacean) or a vertebrate (e.g., fish and amphibian); and several developmental stages (eggs, miracidia, sporocysts, rediae, cercariae, metacercariae and adults). In general, most of the life cycle takes place in aquatic environments. The first intermediate host (freshwater or marine snail) is specific, and provides the resources for development and asexual reproduction, and the means by which trematodes can reach their next host (Lockyer *et al.*, 2004). The larval stages in the first intermediate host can be used as positive indicators of the host community. They are functioning trophic links that are essential in determining life cycles. The study of larval digeneans is relevant both for their biodiversity and for their medical and veterinary importance. These larval stages can cause several diseases in humans and domestic animals such as clonorchiasis, paragonimiasis, schistosomiasis, fascioliasis and cercarial dermatitis (Loker & Hofkin, 2015). In Argentina, fascioliasis and cercarial dermatitis are common parasitic zoonoses (Veleizán *et al.*, 2016; Carnevale *et al.*, 2021).

The first studies in Argentina were carried out by Wernicke in the 1880s (1888, 1892), and cited by Ostrowski de Núñez (1977a); unfortunately, these works were not available. The following record of cercariae was by Bacigalupo (1930, 1932), who described the emergence of the cercariae of *Fasciola hepatica* from the snail *Galba viatrix* in the Buenos Aires province. In the 1950s, Lothar Szidat described the first cercariae from Argentina and pioneered the study of helminths in the country. His contribution to the knowledge about larval digeneans was very important, and included taxonomic descriptions, identification of parasite life

CAMBRIDGE UNIVERSITY PRESS

histories, and definition of human and animal diseases, among others (Ostrowski de Núñez, 1994). Subsequently, his successor, the Argentinian researcher Margarita Ostrowski de Núñez, described more than 100 larval stages of digeneans and elucidated the life cycles of about 30 species of trematodes in fish, reptiles, birds and mammals from freshwater environments. This was a significant contribution to the knowledge about the biology and taxonomy of this group of parasites. Since then, various authors have reported numerous larval stages and life cycles of digeneans. Based on the literature, the present checklist catalogues the diversity of larval digeneans in molluscs from inland waters of Argentina. It includes information on all digeneans, hosts, localities, habitats, prevalence values when available, life cycle if known, and references, among other data.

Materials and methods

An exhaustive search was performed on most of the published records on digeneans in molluscan hosts from freshwater and estuarine habitats in Argentina. The search was carried out in databases and electronic resources such as Google Scholar, Scopus, Research Gate, personal databases, through communication with different authors, and by acquiring earlier paper articles in scientific libraries. The search terms included in English, and in Spanish and German (within parentheses) were larval trematodes (trematodes larvales/Trematoden Larven), larval digeneans (digeneos larvales/Digene Larven), cercaria (cercaria/Cercarien), metacercaria (metacercaria/Metacercarie), molluscs (moluscos/Mollusken), freshwater (agua dulce/Süßwasser), and estuary (estuario/Ästuar) along with the term Argentina. All sources of metadata were consulted up to June 2021. The compiled data were used to create a spreadsheet. The superfamily and family of the digeneans found were determined following Gibson *et al.* (2002), Jones *et al.* (2005), Bray *et al.* (2008) and the World Register of Marine Species (2021). The species of molluscan hosts were updated according to Rumi *et al.* (2006, 2008) and Mollusca Base eds. (2021). The names of the superfamily, family, and species of digeneans and the names of molluscan host species were taken from the published articles or theses. In cases where the name is no longer accepted, it was modified according to the bibliography and electronic databases mentioned above. The ecoregions of Argentina were referred to as in Arana *et al.* (2021).

The checklist of digeneans found in molluscs from Argentina is presented in alphabetical order for each taxonomic category. It also includes: first intermediate molluscan host species; location of mollusc collection in Argentina, along with geographical references; prevalence values (when available); habitat type of the respective larval digenean (lake, shallow lake, pond, temporary pond, lagoon, estuary, reservoir, creek, stream, river, flooded areas of the river and rice field); second intermediate and definitive hosts (when available); and references in chronological order. Most records were based on naturally infected molluscs. Cases that proved to be susceptible to experimental infection but were not found to be naturally infected were denoted with a '^' symbol. Cases that proved to be susceptible to experimental infection and found to be naturally infected were denoted with a '<' symbol.

Table 1. List of molluscan hosts.

Genera	Species	Digenean records
Gateropoda		
Anisancylus	*Anisancylus obliquus* Broderip, 1833	1
Asolene	*Asolene platae* Maton, 1811	2
Aylacostoma	*Aylacostoma chloroticum* Hylton Scott, 1954	4
Biomphalaria	*Biomphalaria orbignyi* Paraense, 1975	19
	Biomphalaria peregrina d'Orbigny, 1835	30
	Biomphalaria straminea Dunker, 1848	24
	Biomphalaria tenagophila occidentalis Paraense, 1981	12
	Biomphalaria tenagophila tenagophila d'Orbigny, 1835	42
Chilina	*Chilina dombeiana* Bruguière, 1789	8
	Chilina fluviatilis Sowerby I, 1838	2
	Chilina fulgurata Pilsbry, 1911	1
	Chilina gibbosa Sowerby I, 1838	11
	Chilina neuquenensis Marshall, 1933	8
	Chilina parchappii d'Orbigny, *1835*	2
	Chilina perrieri Mabille, 1884	1
	Chilina strebeli Pilsbry, 1911	2
Drepanotrema	*Drepanotrema depressissimum* Moricand, 1839	3
	Drepanotrema kermatoides d'Orbigny, 1835	3
	Drepanotrema lucidum Pfeiffer, 1839	3
Galba	*Galba viatrix* d'Orbigny, 1835	3
Heleobia	*Heleobia australis* d'Orbigny, 1835	37
	Heleobia castellanosae Gaillard, 1974	8
	Heleobia conexa Gaillard, 1974	26
	Heleobia parchappii d'Orbigny, 1835	30
	Heleobia piscium d'Orbigny, 1835	7
Physella	*Physella acuta* Draparnaud, 1805	7
Pomacea	*Pomacea canaliculata* Lamarck, 1822	6
Potamolithus	*Potamolithus agapetus* Pilsbry, 1911	2
Stenophysa	*Stenophysa marmorata* Guilding, 1828	1
Strobeliatatea	*Strobelitatea hatcheri* Pilsbry, 1911	4
Uncancylus	*Uncancylus concentricus* d'Orbigny, 1835	7
Bivalva		
Pisidium	*Pisidium ocloya* Ituarte, 2005	1
Diplodon	*Diplodon chilensis* Gray, 1828	2
Rhipidodonta	*Rhipidodonta variabilis* Maton, 1811	3

Results

A total of 113 scientific articles and nine theses were analysed. The studies, published between 1930 and 2021, reported the interaction between digeneans and molluscs from freshwater and estuarine habitats in Argentina. The 34 mollusc species reported belonged to 17 genera (table 1) and were parasitized by 213 larval digeneans from 13 superfamilies and 35 families (table 2). All these digeneans were identified in 102 locations corresponding

https://doi.org/10.1017/S0022149X2100081X Published online by Cambridge University Press

Table 2. Digenean list found in molluscan hosts from Argentina.

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
Apocreadioidea Skrjabin, 1942						
Apocreadiidae Skrjabin, 1942	Apocreadiidae gen. sp.[a]	*Heleobia australis*	Bahía Blanca. *P* = 0.1			Alda & Martorelli (2014)
	Cercaria Heleobicola II	*H. australis*	Cangrejo. *P* = 0.33			Parietti *et al.* (2013)
		Heleobia conexa	Mar Chiquita. *P* = 0.75, 0.07-0.19			Martorelli (1989b); Merlo & Etchegoin (2011)
	Cercaria macronucleata (*Procaudotestis uruguayensis* Szidat, 1954)	*Rhipidodonta variabilis*	De La Plata			Szidat (1954; 1964)
	Homalometron pseusodopallidum Martorelli, 1986	*Heleobia castellanosae*	Los Talas. *P* = 50	Tubificidae[c]	*Gymnogeophagus australis* (Eigenmann, 1907)	Martorelli (1986a)
Bucephaloidea Poche, 1907						
Bucephalidae Poche, 1907	*Bucephallus* sp.	*R. variabilis*	De la Plata			Castellanos & Gluzman de Pascar (1969)
Diplostomoidea Poirier, 1886						
	Furcocercaria N° 1	*Biomphalaria tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 2	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 3	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 4	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 5	*Biomphalaria straminea*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria sp. IV	*Drepanotrema depressissimum*	Paiva. *P* = 0.4-3			Hamann *et al.* (1993)
		Drepanotrema lucidum	Paiva. *P* = 0.5			Hamann *et al.* (1993)
	Metacercariae Strigeidae		Salto Grande	*B. tenagophila tenagophila*		Martorelli *et al.* (2013)
Cyathocotylidae Mühling, 1898	Furcocercaria sp. 1	*H. australis*	Cangrejo. *P* = 0.33-1.33			Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 0.07-0.25			Etchegoin & Martorelli (1998); Merlo & Etchegoin (2011)
Diplostomidae Poirier, 1886	Furcocercaria sp. I	*B. straminea*	Basin of Riachuelo. *P* = 0.2			Ostrowski de Núñez *et al.* (1990)
	Furcocercaria II	*Uncancylus concentricus*	De la Plata			Ostrowski de Núñez (1972)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
	Furcocercaria III	*Drepanotrema kermatoides*	Luján			Ostrowski de Núñez (1977a)
	Furcocercaria IV	*Uncancylus* sp.	Luján Colastine			Ostrowski de Núñez (1977a)
	Furcocercaria V	*Biomphalaria peregrina*	Luján Colastine			Ostrowski de Núñez (1977a)
	Furcocercaria VI	*B. peregrina*	Luján Colastine			Ostrowski de Núñez (1977a)
	Furcocercaria VII (*Posthodiplostomum* sp.)	*U. concentricus*	Luján Colastine	*Phalloceros caudimaculatus* (Hensel, 1868) and *Cnesterodon decemmaculatus* (Jenyns, 1842)		Ostrowski de Núñez (1977a)
	Furcocercaria sp. XVII[a]	*B. straminea*	Agricultural area. *P* = 0.09-1.02			Fernández *et al.* (2013)
		B. tenagophila tenagophila	Suburban area. *P* = 1.16			Fernández *et al.* (2013)
		B. tenagophila occidentalis	Suburban area. *P* = 0.62			Fernández *et al.* (2013)
	Furcocercaria XIX[a]	*B. straminea*	Agricultural area. *P* = 0.04			Fernández & Hamann (2017)
	Furcocercaria sp. X (aff. *Diplostomum* sp.)	*Biomphalaria orbignyi*	Basin of Santa Lucía. *P* = 0.07			Ostrowski de Núñez *et al.* (1997)
	Metacercaria tetracotyle		Luján Colastine	*B. peregrina*		Ostrowski de Núñez (1977a)
	Posthodiplostomum sp. [a]	*Anisancylus obliquus*	Patagua. *P* = 1	*Galaxias maculatus* Jenyns, 1842[c]	*Gallus gallus* (Linnaeus, 1758) [c] and *Mus musculus* Linnaeus, 1758[c]	Ritossa *et al.* (2013; 2014)
	Posthodiplostomum nanum Dubois, 1937	*U. concentricus*	De la Plata	*C. decemmaculatus* and *P. caudimaculatus*		Ostrowski de Núñez (1973)
	Tylodelphys spp.	*Chilina* sp.	Escondido. *P* = 14.3 El Trébol. *P* = 8.3 Nahuel Huapi. *P* = 8.3 Nahuel Huapi. *P* = 3.5			Ostrowski de Núñez & Quaggiotto (1995); Quaggiotto & Valverde (1995)
		Chilina dombeiana	Mascardi. *P* = 13.9 Llum. *P* = 20			Flores & Semenas (2008); Veleizán (2009)
		Chilina gibbosa	Arelauquen Gutiérrez. *P* = 18.5 Bahía Gutiérrez. *P* = 9.9 El Dique Gutiérrez. *P* = 63.9 Melipal Nahuel Huapi. *P* = 27.2 Nahuel Huapi. *P* = 1.7			Veleizán (2009)
						Veleizán (2009)

		Chilina neuquenensis	Correntoso. Espejo. *P* = 1.6 Ruca Malen Correntoso			
Diplostomidae or Strigeidae Railliet, 1919	Furcocercaria gen. sp. 1	*B. peregrina*	Mar de Cobo. *P* = 1.1-5.5			Parietti (2018)
Strigeidae	*Apatemon*	*Chilina* sp.	Escondido. *P* = 1.55			Quaggiotto & Valverde (1995)
	Apatemon sp.	*C. dombeiana*	Mascardi. *P* = 0.5-1.3			Flores & Semenas (2008)
		C. neuquenensis	Espejo. *P* = 0.8			Veleizán (2009)
	Apharyngostrigea simplex (Johnston, 1904)	*B. straminea*	Zoo	*C. decemmaculatus* [c] and *Cichlaurus facetus* (Jenyns 1842)[c]	*Egretta thula* (Molina, 1782)	Ostrowski de Núñez (1989)
	Australapatemon magnacetabulum Dubois, 1988 [a]	*B. tenagophila tenagophila*	Tres Palmeras. P (cercariae) = 1.46; P (metacercariae) = 21	*B. tenagophila tenagophila*, *Helobdella adiastola* Ringuelet, 1972, *Helobdella triserials* (Em. Blanchard, 1849), *Haementeria eichhorniae* Ringuelet, 1978 and *Haementeria* sp.	*G. gallus* [c] and *Anas platyrhynchos* Linnaeus, 1758 [c]	Davies & Ostrowski de Núñez (2012)
	Cotylurus sp.	*B. peregrina*	Fantasma. P (cercariae) = 1.5-2.5; P (metacercariae) = 23-27.7	*B. peregrina*		Flores *et al.* (2010)
			Campo Alegre. *P* = 1.41	*B. tenagophila tenagophila*		Davies (2014)
			Puerta de Díaz. *P* = 2.12	*B. orbignyi*		Davies (2014)
	Furcocercaria I [a]	*B. peregrina*	Del Monte			Ostrowski de Núñez (1972)
	Furcocercaria sp. III [a]	*B. tenagophila occidentalis*	Paiva. *P* = 0.20 Suburban area. *P* = 0.13			Ostrowski de Núñez *et al.* (1991); Fernández *et al.* (2016)
		B. tenagophila tenagophila	Suburban area. *P* = 0.32			Fernández *et al.* (2016)
	Furcocercaria sp. V	*B. straminea*	Agricultural area. *P* = 0.40			Fernández & Hamann (2017)
	Furcocercaria sp. VIII (aff. Strigea, *Parastrigea* sp.)	*B. orbignyi*	Basin of Santa Lucía, San Roque. *P* = 0.28			Ostrowski de Núñez *et al.* (1997)
		B. peregrina	Basin of Santa Lucía, San Roque. *P* = 3.7			Ostrowski de Núñez *et al.* (1997)
	Furcocercaria sp. XIII (aff. Strigea)	*B. orbignyi*	Basin of Santa Lucía, San Roque. *P* = 0.08			Ostrowski de Núñez *et al.* (1997)
		B. tenagophila tenagophila	Basin of Santa Lucía, San Roque. *P* = 0.06			Ostrowski de Núñez *et al.* (1997)
	Furcocercaria sp. XIV [a]	*B. straminea*	Agricultural area. *P* = 0.11-1.45			Fernández *et al.* (2013)
	Furcocercaria sp. XV [a]	*B. straminea*	Agricultural area. *P* = 0.17-2.85			Fernández *et al.* (2013)
	Furcocercaria sp. XVI [a]	*B. straminea*				Fernández *et al.* (2013)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
			Agricultural area. *P* = 1.31-4.22			
	Furcocercaria XX [a]	*B. straminea*	Agricultural area. *P* = 0.04			Fernández & Hamman (2017)
	Metacercaria Strigeidae gen. sp. 1		Mar de Cobo. *P* = 3.67 Nahuel Rucá. *P* = 3.67 Reserva Puerto. *P* = 25.33 La Brava. *P* = 6.7	*B. peregrina*		Parietti *et al.* (2015)
	Strigea sp.	*B. tenagophila tenagophila*	Tres Palmeras. *P* = 0.07	*Rhinella paracnemis* (Werner, 1894)[c]		Davies (2014)
Echinostomatoidea Looss, 1902						
	Cercaria Gymnocephala sp. II	*U. concentricus*	De la Plata Luján	*Bufo arenarun* (Hensel, 1867) [c], *Hyla puchella* (Duméril y Bibron, 1841) and *Lysapsus mantidactilus* (Gallardo, 1961)		Ostrowski de Núñez (1981)
	Cercaria Echinostomatidae N° 1	*B. straminea*	Salto Grande			Martorelli *et al.* (2013)
		B. tenagophila tenagophila	Salto Grande			Martorelli *et al.* (2013)
	Cercaria Echinostomatidae N° 2	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Cercaria Echinostomatidae N° 3	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Cercaria Echinostomatidae N° 4	*B. straminea*	Salto Grande			Martorelli *et al.* (2013)
		B. tenagophila tenagophila	Salto Grande			Martorelli *et al.* (2013)
	Echinocercaria sp. I	*B. peregrina*	Del Monte Embalse Río Tercero			Martorelli *et al.* (2013)
	Metacercaria Echinostomatidae N° 1		Salto Grande	*B. straminea*		Martorelli *et al.* (2013)
			Salto Grande	*B. tenagophila tenagophila*		Martorelli *et al.* (2013)
	Metacercaria Echinostomatidae N° 2		Salto Grande	*B. tenagophila tenagophila*		Martorelli *et al.* (2013)
Cyclocoelidae Stossich, 1903	Cercariae de Cyclocoelidae	*Chilina parchappii*	Quequén			Szidat (1963)
Echinochasmidae Odhner, 1910	*Echinochasmus sensu lato* [b]	*Asolene platae*	Regatas. *P* = 47			Dellagnola *et al.* (2019)
Echinostomatidae Looss, 1899	Cercaria Echinostomatoidea sp. 1	*H. australis*	Cangrejo. *P* = 0.32			Parietti *et al.* (2013)
		H. conexa	Mar Chiquita			Etchegoin & Martorelli (1998)
		Heleobia parchappii	Corrientes La Brava			Merlo *et al.* (2019); Parietti *et al.* (2020)

	Cercaria Gymnocephala sp. I	*Heleobia piscium*	De la Plata	*C. decemmaculatus* [c] and *P. caudimaculatus* [c]	Ostrowski de Núñez (1975a)
	Cercaria Heleobicola IV	*H. conexa*	Mar Chiquita. *P* = 0.3	*Jenynsia lineata* (Jenyns, 1842) [c]	Martorelli (1990); Merlo & Etchegoin (2011)
		H. parchappii	La Brava		Merlo *et al.* (2019)
	Cercaria Heleobicola V	*H. australis*	Cangrejo. *P* = 0.3-1.3		Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 0.1-0.6		Martorelli (1990); Merlo & Etchegoin (2011); Etchegoin *et al.* (2012)
	Cercaria Magnacauda gen. sp. 1	*B. peregrina*	Mar de Cobo. *P* = 0.4-4.3		Parietti (2018)
	Echinocercaria gen. sp. 1	*B. peregrina*	Mar de Cobo. *P* = 1.39		Parietti *et al.* (2015)
	Echinocercaria I	*C. dombeiana*	Mascardi. *P* = 0.2		Flores *et al.* (2010)
	Echinocercaria sp. 1 [a]	*B. tenagophila tenagophila*	Suburban area. *P* = 4.13	*B. tenagophila tenagophila*	Fernández *et al.* (2016)
		B. tenagophila occidentalis	Suburban area. *P* = 2.29	*B. tenagophila occidentalis*	Fernández *et al.* (2016)
	Echinocercaria sp. 1	*B. tenagophila tenagophila*	Tres Palmeras. *P* = 0.03 Campo Alegre (Salta). *P* = 0.8	*Astyanax* sp.[c], *Jenynsia* sp.[c] and *Rhinella* sp.[c]	Davies (2014)
	Echinocercaria sp. 2 (cf. *Paryphostomum* sp.) [a]	*B. tenagophila occidentalis*	Suburban area. *P* = 0.13		Fernández *et al.* (2016)
	Echinocercaria sp. 3	*B. orbignyi*	Puerta de Díaz. *P* = 0.3	*Physella acuta* [c], *B. tenagophila tenagophila*[c], *Rhinella arenarum* (Hensel, 1867) [c]	Davies (2014)
		B. tenagophila tenagophila	Tres Palmeras. *P* = 0.03 Campo Alegre (Salta). *P* = 0.5	*P. acuta*[c], *B. tenagophila tenagophila* [c] and *R. arenarum* [c]	Davies (2014)
	Echinocercaria sp. 3 (cf. *Echinoparyphium* sp.)	*B. tenagophila tenagophila*	Suburban area. *P* = 0.16		Fernández *et al.* (2016)
		B. tenagophila occidentalis	Suburban area. *P* = 0.13		Fernández *et al.* (2016)
	Echinocercaria sp. II	*B. straminea*	Basin of Riachuelo. *P* = 0.30		Ostrowski de Núñez *et al.* (1990)
	Echinocercaria sp. III	*B. tenagophila occidentalis*	Paiva. *P* = 1.40		Ostrowski de Núñez *et al.* (1991)
	Echinocercaria sp. IV [a]	*B. orbignyi*	Basin of Santa Lucía. *P* = 0.20	*B. orbignyi*	Ostrowski de Núñez *et al.* (1997)
		B. peregrina	Basin of Santa Lucía. *P* = 3.70		Ostrowski de Núñez *et al.* (1997)
		B. straminea	Basin of Santa Lucía. *P* = 1.30		Ostrowski de Núñez *et al.* (1997)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
		B. tenagophila tenagophila	Basin of Santa Lucía. *P* = 2.80 Suburban area (Corrientes)	*B. tenagophila tenagophila*		Ostrowski de Núñez *et al.* (1997); Fernández *et al.* (2016)
		B. tenagophila occidentalis	Basin of Santa Lucía. *P* = 23 Suburban area			Ostrowski de Núñez *et al.* (1997); Fernández *et al.* (2016)
	Echinocercaria sp. V	*B. orbignyi*	Basin of Santa Lucía. *P* = 0.07	*B. orbignyi*		Ostrowski de Núñez *et al.* (1997)
		B. straminea	Agricultural area. *P* = 1.52	*B. straminea*		Fernández (2014)
	Echinocercaria sp. VII (cf. *Petasiger* sp.)	*B. tenagophila occidentalis*	Paiva. *P* = 1.10			Ostrowski de Núñez *et al.* (1991)
	Echinocercaria sp. XIII [a]	*B. straminea*	Agricultural area. *P* = 0.02-0.15			Fernández *et al.* (2014)
	Echinocercaria sp. XIV [a]	*B. straminea*	Agricultural area. *P* = 0.02-0.10			Fernández *et al.* (2014)
	Echinocercaria sp. XVI [a]	*B. straminea*	Agricultural area. *P* = 0.06-1.39			Fernández *et al.* (2014)
	Echinoparyphium megacirrus Semenas, Brugni & Ostrowski de Núñez, 1999 [a]	*C. dombeiana*	Mascardi. *P* = 0.4-0.5 Pulmari. *P* = 29.2 Lolog. *P* = 66.6 La Larga. *P* = 30 Las Mercedes. *P* = 61.9 El Trébol. *P* = 3.3 Mascardi. *P* = 7.9 Steffen. *P* = 83.3 Gutiérrez	*Diplodon chilensis*	*G. gallus* [c]	Semenas *et al.* (1999); Flores *et al.* (2010); Flores & Semenas (2016)
		C. gibbosa	Arelauquen Gutiérrez. *P* = 4.5 Bahía Gutiérrez. *P* = 3.2 Nahuel Huapi. *P* = 2 El Trébol. *P* = 1 Nahuel Huapi. *P* = 4.4-4.9			Veleizán (2009)
		C. neuquenensis	Hotel Espejo. *P* = 1.4 Ruca Malen Correntoso. *P* = 6.5			Veleizán (2009)
	Echinoparyphium sp. [a]	*B. peregrina*	Fantasma. P(cercaria) = 1.5-2.5. P (metaceraria) = 29.2-35.3 Cholila	*Galba viatrix* and *Biomphalaria* sp.[d]	*G. gallus* [c]	Prepelitchi (2002); Flores *et al.* (2010)
	Echinoparyphium sp. 1		La Playita Puelo. *P* = 0.4	*C. gibbosa*		Veleizán (2009)

	Echinochasmus talaensis Martorelli, 1985	*H. parchappii*	Los Talas	*Cnesterodon decenmaculatus*[c]	*Pitangus sulphuratus* (Linnaeus, 1766)	Martorelli (1985)
	Echinostoma parcespinosum Lutz, 1924	*Pomacea canaliculata*	Los Talas	*P. canaliculata* [c], *B. peregrina* [c] and *Stenophysa marmorata* [c]	*Rallus maculatus maculatus* (Boddaert), 1783 and *Rallus sanguinolentus sanguinolentus* (Swainson, 1838)	Martorelli (1987)
	Echinostoma sp.	*G. viatrix*	*G. viatrix*: Cholila *D. chilensis*: Piré. P (metacercariae) = 27.3 *D. chilensis*: Mascardi. P(metacercariae) = 3.5 *D. chilensis*: Gutiérrez	*D. chilensis*, *G. viatrix* and *Biomphalaria* sp.[c]	*G. gallus* [c]	Ostrowski de Núñez & Quaggiotto (1995); Semenas *et al.* (1999); Prepelitchi (2002); Prepelitchi & Ostrowski de Núñez (2007); Flores & Semenas (2016)
	Echinostomatidae	*Chilina* sp.	Escondido. P (cercariae) = 2.32; P (metacercariae) = 7.8 El Trébol. P (cercariae) = 25 Escondido. P (metacercariae) = 27.7 Gutiérrez. *P* (cercariae) = 23.1; P (metaercariae) = 6.3 La Balsa. P(cercariae) = 57.1 Ñirihuau. P(cercariae) = 7.0. P (metacercariae) = 15.8 Nahuel Huapi Bonita beach. P (metacercariae) = 50 Rosario. P(cercariae) = 23.3; P (metaercariae) = 26.6	*Chilina* sp.		Ostrowski de Núñez & Quaggiotto (1995); Quaggioto & Valverde (1995); Prepelitchi & Ostrowski de Núñez (2007); Flores & Semenas (2016)
		C. gibbosa	Juventus. *P* = 2.2 Regatas Nahuel Huapi. *P* = 2.6			Veleizán (2009)
		C. neuquenensis	Camping Correntoso. *P* = 1.7			Veleizán (2009)
	Episthmium suspensum (Braun, 1901)	*B. peregrina*	Del Monte	*Bufus arenarum* [c]	*G. gallus* [c]	Ostrowski de Núñez (1974b)
	Metacercaria Echinostomatidae sp. 1		Campo Alegre. *P* = 0.32 Tres Palmeras. *P* = 0.06 Puerta de Díaz. *P* = 1.91	*B. tenagophila tenagophila* and *B. orbignyi*		Davies (2014)
	Metacercaria Echinostomatidae sp. 6		Puerta de Díaz. *P* = 4.24	*B. orbignyi*		Davies (2014)
	Metacercaria Echinostomatidae sp. 8		Puerta de Díaz. *P* = 0.9	*B. orbignyi*		Davies (2014)
	Himasthla sp. [a]	*H. australis*	Bahía Blanca. *P* = 0.1			Alda & Martorelli (2014)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
	Metacercaria Echinostomatidae gen. sp. 1		Mar de Cobo. *P* = 1.1-7.5	*B. peregrina*		Parietti (2018)
	Petasiger sp.	*B. orbignyi*	Puerta de Díaz. *P* = 0.3	*Astyanax* sp. [c], *Piabina thomasi* Fowler, 1940 [c] and *Apistogramma borelli* (Regan, 1906) [c]		Davies (2014)
		B. tenagophila tenagophila	Campo Alegre. *P* = 0.31	*Astyanax* sp.[c], *Bryconamericus thomasi* (Fowler, 1940) [c] and *A.a borelli* [c]		Davies (2014)
	Stephanoprora aylacostoma Ostrowski de Núñez & Quintana, 2008 [a]	*Aylacostoma chloroticum*	Paraná Heller Peninsula	*C. decemmaculatus*, *Poecilia reticulata* Peters, 1859, *Moenkhausia dichroura* (Kner, 1858), *Astyanax erythropterus* (Holmberg, 1891) and *Hyphessobrycon serpae* (Durbin in Eigenmann, 1908)	*G. gallus* [c]	Ostrowski de Núñez & Quintana (2008)
	Stephanoprora uruguayense Holcman-Spector & Olague, 1989 [a]	*H. australis*	Bahía Blanca. *P* = 0.1			Alda & Martorelli (2014)
		H. parchappii	Zoo	*C. decemmaculatus* [c]	*G. gallus* [c]	Ostrowski de Núñez (2007)
Fasciolidae Railliet, 1895	*Fasciola hepatica* Linnaeus, 1758 [a]	*Galba* sp.	Agrio, Las Lajas Campo Tipiliuke Experimental Field Instituto Nacional de Tecnología Agropecuaria Mayoco			Soler (2018)
		G. viatrix	Cholila. *P* = 0.9 El Bolsón Campo. *P* = 0.67 Campos Neuquén Loncopué. *P* = 2 San Luis Buchardo			Bacigalupo (1930; 1932); Kleiman *et al.* (2004); Rubel *et al.* (2005); Mignaqui *et al.* (2020)
		Physella spp.	Esquel			Sanero *et al.* (2018)
Psilostomidae Looss, 1900	*Cercaria macrogranulosa*	*B. orbignyi*	Basin of Riachuelo Suburban area (Corrientes). 27°27´S, 58°44´. *P* = 3.02	*Odontophrynus americanus* (Duméril & Bibron, 1841) [c]		Ostrowski de Núñez *et al.* (1990); Fernández (2014)
		B. peregrina	Basin of Santa Lucía			Ostrowski de Núñez *et al.* (1990)
		B. straminea	Basin of Riachuelo			Ostrowski de Núñez *et al.* (1990)
		D. depressissimum	Basin of Riachuelo			Ostrowski de Núñez *et al.* (1990)
	Psilochasmus oxyurus (Creplin, 1825)	*H. australis*	Cangrejo. *P* = 0.33 Bahía Blanca. *P* = 0.1			Alda & Martorelli (2014); Parietti *et al.* (2013)
		H. castellanosae	Zoo			Cutellé (1998)

		H. conexa	Mar Chiquita. *P* = 0.29-0.86			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
		H. parchappii	Tapera Corrientes Lobería Carolina Los Padres La Brava Nahuel Rucá. *P* = 1.03 Chascomús	*H. parchappii*		Szidat (1957); Merlo *et al.* (2017; 2019); Parietti *et al.* (2020)
	Ribeiroia sp. [ab]	*B. orbignyi*	Puerta de Díaz. *P* = 0.64	*R. arenarum* (Hensel, 1867) [c]		Davies *et al.* (2015)
		B. tenagophila tenagophila	Campo Alegre. *P* = 0.16	*R. arenarum* [c]		Davies *et al.* (2015)
		B. tenagophila occidentalis	Paiva. *P* = 2.20 Suburban area (Corrientes). 27°29', 58°46'. *P* = 0.50			Ostrowski de Núñez *et al.* (1991); Fernández *et al.* (2016)
Gorgoderoidea Looss, 1901						
	Macrocercaria sp. I	*P. canaliculata*	Luján			Ostrowski de Núñez (1981)
		P. acuta	Luján			Ostrowski de Núñez (1981)
Allocreadiidae Looss, 1902	*Auriculostoma ocloya* Liquin, Gilardoni, Cremonte, Saravia, Cristóbal & Davies 2022[a,b]	*Pisidium ocloya*	Lesser. *P* = 72	*Hyalella* sp.	*Heptapterus qenqo* Azpelicueta, Aguilera & Mirande, 2011 and *Corydoras micracanthus* Regan, 1912	Liquín *et al.* (2022)
Haploporoidea Nicoll, 1914						
Haploporidae Nicoll, 1914	Cercaria Haploporidae sp. 1	*H. conexa*	Mar Chiquita. *P* = 0.29-0.97			Etchegoin & Martorelli (1998); Merlo & Etchegoin (2011)
		H. parchappii	Tapera			Parietti *et al.* (2020)
		H. australis	Cangrejo. *P* = 0.11-0.66			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
	Cercaria Haploporidae sp. 2	*H. conexa*	Mar Chiquita. *P* = 0.60-1.35			Etchegoin & Martorelli (1998); Merlo & Etchegoin (2011)
		H. australis	Cangrejo. *P* = 0.33-55.92			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
	Cercaria Heleobicola III	*H. conexa*	Mar Chiquita. *P* = 0.08-0.58			Martorelli (1989b); Etchegoin & Martorelli (1998); Merlo & Etchegoin (2011)
		H. australis	Cangrejo. *P* = 0.32			Parietti *et al.* (2013)
	Cercaria Saccocoelioides sp.	*H. piscium*	De la Plata			Ostrowski de Núñez (1975b)
	Saccocoelioides	*Potamolithus agapetus*	De la Plata. *P* = 10-55			López Armengol & Martorelli (1997)
	Cercaria Haploporidae gen. sp. 4	*H. australis*	Cangrejo. *P* = 0.33			Merlo *et al.* (2014)
		H. parchappii				Merlo *et al.* (2014; 2019)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
			La Brava Los Padres Nahuel Rucá. *P* = 0.5			
	Haploporidae gen. sp.	*H. australis*	Bahía Blanca. *P* = 0.3			Alda & Martorelli (2014)
	Saccocoelioides carolae Lunaschi, 1984	*P. canaliculata*	Luján	*Hyla pulchella* [c]		Martorelli (1986b)
	Saccocoelioides octavus Szidat, 1970	*H. parchappii*	Chascomús			Graefe (1970); Szidat (1970)
Hemiuroidea Looss, 1899						
	Hemiuroidea	*Chilina* sp.	La Balsa. *P* = 4.5			Quaggiotto & Valverde (1995)
Derogenidae Nicoll, 1910	Cercaria Hemiuridae sp. 1	*H. parchappii*	Los Padres Nahuel Rucá. *P* = 0.33-5.89			Merlo (2014); Merlo *et al.* (2017; 2019)
	Genarchella genarchella (Travassos, Artigas & Pereira, 1928)	*H. parchappii*	Cercariae: Chascomús and Los Padres Metacercariae: Los Talas, Tapera, Lobería, Carolina and La Brava	*H. parchappii*	*H. parchappii*	Szidat (1956); Martorelli (1989a); Merlo *et al.* (2019); Parietti *et al.* (2020)
	Genarchella pichileufuensis Tsuchida *et al.*, 2021[a]	*Strobelitatea hatcheri*	Pichileufu. *P* = 2		*Hatcheria macraei*	Tsuchida *et al.* (2021)
Hemiuridae Looss, 1899	*Cercaria cystophora* sp.	*P. agapetus*	De la Plata	Copepoda [c]		Martorelli (1994)
Microphalloidea Ward, 1901						
	Xiphidiocercaria sp. IV	*H. piscium*	De la Plata			Ostrowski de Núñez (1981)
Lecithodendriidae Lühe, 1901	Cercaria Lecithodendriidae sp. 1	*H. parchappii*	Nahuel Ruca			Merlo (2014)
	Xiphidiocercaria sp. III	*H. piscium*	De la Plata			Ostrowski de Núñez (1975a)
Microphallidae Ward, 1901	*Levinseniella cruzi* Travassos, 1920	*H. australis*	Bahía Blanca. *P* = 1.7			Alda & Martorelli (2014)
		H. conexa	Mar Chiquita	*Palaemonetes argentinus* Nobili, 1901	*Himantopus melanurus* (Vieillot, 1817)	Martorelli (1988)
		H. parchappii	Los Talas Nahuel Ruca	*P. argentinus*	*Rollandia rolland chilensis* (Quoy & Gaimard, 1824)	Martorelli (1988); Merlo (2014)
	Maritrema bonaerensis Etchegoin & Martorelli, 1997	*H. australis*	Mar Chiquita. *P* = 1.3-1.7 Bahía Blanca. *P* = 3.63 (±3.17) Cangrejo. *P* = 6.42-42.86	*Cyrtograpsus angulatus* (Dana, 1851) and *Neohelice granulata* (Dana, 1851)	*Larus maculipennis* Lichtenstein, 1823, *Larus atlanticus* Olrog, 1958 and *Larus dominicanus* (Lichtenstein, 1823)	Etchegoin *et al.* (2012); Alda *et al.* (2013); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 0.07-0.48			Etchegoin & Martorelli (1997); Etchegoin *et al.* (2012),

	Maritrema orensensis Cremonte & Martorelli, 1998[a]	*H. australis*	Bahía Blanca	*C. angulatus* and *N. granulata*	*L. dominicanus* and *L. atlanticus*	Alda *et al.* (2013)
	Microphallus simillimus Martorelli, 1986	*B. peregrina*	Mar de Cobo. *P* = 0.17	*B. peregrina* (abbreviate life cycle)		Parietti *et al.* (2021)
		H. australis	Bahía Blanca. *P* = 24.2 Cangrejo. *P* = 0.33-0.67	*H. australis* (abbreviate life cycle)		Alda & Martorelli (2014); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 5.17	*H. conexa* (abbreviate life cycle)	*H. melanurus*	Martorelli (1991); Merlo & Etchegoin (2011); Etchegoin *et al.* (2012)
		H. parchappii	Tapera Corrientes Lobería Carolina Los Padres La Brava Nahuel Rucá	*H. parchappii* (abbreviate life cycle)		Merlo *et al.* (2017; 2019); Parietti *et al.* (2020)
	Microphallus szidati Martorelli, 1986	*H. australis*	Cangrejo. *P* = 4·11 (±2·21)			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita Los Talas	*C. angulatus* and *P. argentinus*	*H. melanurus* and *R. sanguinolentus sanguinolentus*	Martorelli (1986c; d); Merlo & Etchegoin (2011); Etchegoin *et al.* (2012)
		H. parchappii	Los Talas Tapera Corrientes Lobería Carolina Los Padres La Brava Nahuel Rucá. *P* = 11.79	*P. argentinus*	*R. sanguinolentus sanguinolentus*	Martorelli (1986c; d); Merlo *et al.* (2017; 2019); Parietti *et al.* (2020)
	Xiphidiocercaria (Armatae)	*H. australis*	Bahía Blanca (Buenos Aires). 38°51', 61°15'.			Alda (2011)
Phaneropsolidae Mehra, 1935	Phaneropsolus sp. [b]	*A. platae*	Regatas. *P* = 47			Dellagnola *et al.* (2019)
Renicolidae Dollfus, 1939	Renicola sp. [a]	*H. australis*	Bahía Blanca. *P* = 1.3			Alda & Martorelli (2014)
	Renicolidae gen. sp. [a]		Bahía Blanca. *P* = 2.3	*H. australis*		Alda & Martorelli (2014)
Opisthorchioidea Looss, 1899						
Cryptogonimidae Ward, 1917	*Acanthostomoides apophalliformis* Szidat, 1956	*S. hatcheri*	Espejo. *P* = 9.4 Correntoso. *P* = 4-8 Nahuel Huapi. *P* = 0.8-3.1 Escondido. *P* = 3.3 Moreno. *P* = 2.5 Ñirihuau. *P* = 3.4	*G. maculatus*	*Percichthys trucha* Cuvier & Valenciennes, 1840	Ostrowski de Núñez *et al.* (1999)
	Acanthostomum brauni Mañé Garzón & Gil, 1961	*H. castellanosae*	Zoo	Cyprinodontiformes [d]	*Phrynops hilari* (Duméril & Bibron, 1835)	Ostrowski de Núñez (1987)
	Acanthostomum gnerii Szidat, 1954	*H. parchappii*	Los Ranchos	*Rhamdia sapo* (Quoy & Gaimard, 1824)	*Basilichthys bonariensis* (Valenciennes, 1835),	Ostrowski de Núñez & Gil de Pertierra (1991)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
					Astyanax sp. and *C. decemmaculatus*	
	Cercaria Acanthostomidae gen. sp. 1	*H. parchappii*	Nahuel Rucá Tapera Corrientes Lobería Carolina Los Padres La Brava			Merlo *et al.* (2014; 2019); Parietti *et al.* (2020)
	Cercaria Pleurolophocerca I	*H. piscium*	De la Plata	*C. decemmaculatus* [d], *P. caudimaculatus* [d] and *Astyanax fasciatus* Cuvier, 1819 [d]		Ostrowski de Núñez (1974a)
	Cryptogonimidae gen. sp. [a]	*H. australis*	Bahía Blanca. $P = 0.3$			Alda & Martorelli (2014)
	Neocladocystis intestinalis (Vaz, 1932) [a]	*A. chloroticum*	Yacyretá. $P = 21$	*M. dichroura*, *Hyphessobrycon eques*, *P. reticulata*, *C. decemmaculatus*, *Gymnocorymbus ternetzi* and *Prochilodus* sp.	*Salminus brasiliensis* (Cuvier, 1816) [c]	Quintana & Ostrowski de Núñez (2016)
	Pleurolophocercaria I	*H. australis*	Cangrejo. $P = 0.33$-2			Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. $P =$ 0.58-2.03			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
	Pseudosellacotyla lutzi (Freitas, 1941) [a]	*A. chloroticum*	Yacyretá. $P = 0.81$	*M. dichroura*, *P. reticulata*, *C. decemmaculatus* and *G. ternetzi*	*Hoplias malabaricus* Bloch, 1794 [c]	Quintana & Ostrowski de Núñez (2014)
Heterophyidae Leiper, 1909	*Ascocotyle (Ascocotyle) secunda* Ostrowski de Nuñez, 2001	*H. parchappii*	Los Ranchos	*J. lineata* and *C. decemmaculatus*	*G. gallus*[c]	Ostrowski de Núñez (2001)
		H. castellanosae	Zoo	*J. lineata* and *C. decemmaculatus*	*G. gallus* [c]	Ostrowski de Núñez (2001)
	Ascocotyle (Ascocotyle) tenuicollis Nasir, de Guevara & Díaz, 1971	*H. piscium*	De la Plata	*C. decemmaculatus* [c]	*Butorides striatus* (Linnaeus, 1758) and *Ixobrychus involucris* (Vieillot, 1823)	Ostrowski de Núñez (1976a)
	Ascocotyle (Ascocotyle) tertia Ostrowski de Núñez, 2001	*H. parchappii*	Los Ranchos	*J. lineata* and *C. decemmaculatus*	*G. gallus* [c]	Ostrowski de Núñez (2001)
		H. castellanosae	Zoo	*J. lineata* and *C. decemmaculatus*	*G. gallus* [c]	Ostrowski de Núñez (2001)
	Ascocotyle (Leighia) hadra Ostrowski de Núñez, 1992	*H. australis*	Cangrejo			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. $P =$ 0.59-10.18			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
		H. parchappii	Los Ranchos Tapera Corrientes Lobería Carolina La Brava Los Padres Nahuel Ruca. $P = 1.03$	*C. decemmaculatus* [c] and *J. lineata* [c]		Ostrowski de Núñez (1992); Merlo *et al.* (2019); Parietti *et al.* (2020)
	Ascocotyle (Phagicola) angeloi Travassos, 1929	*H. castellanosae*	Zoo	*J. lineata* [c]	*G. gallus* [c] and *M. musculus* [c]	Ostrowski de Núñez (1998)

	Ascocotyle (Phagicola) diminuta (Stunkard & Haviland, 1924)	*H. parchappii*	Los Ranchos	*C. decemmaculatus* [c]	*G. gallus*[c] and *M. musculus*[c]	Ostrowski de Núñez (1993)
		H. castellanosae	Zoo	*C. decemmaculatus* [c]	*G. gallus* [c] and *M. musculus* [c]	Ostrowski de Núñez (1993)
	Ascocotyle (Phagicola) longa Ransom, 1920 [b]	*H. australis*	Bahía Blanca. *P* = 0.9		*Ardea cocoa* Linnaeus, 1766, *Spheniscus magellanicus* (Forster, 1781) and *Otaria flavescens* Shaw, 1800	Alda *et al.* (2015)
	Cercaria Heterophyidae gen. sp. 6	*H. australis*	Cangrejo. *P* = 0.22-3.33			Parietti *et al.* (2013); Merlo *et al.* (2014)
		H. parchappii	Tapera Lobería Carolina La Brava Los Padres Nahuel Ruca. *P* = 2.56			Merlo *et al.* (2014; 2017; 2019); Parietti *et al.* (2020)
	Cercaria magnacauda I	*H. australis*	Cangrejo. *P* = 0.11-2			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 0.14			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
	Pygidiopsis pinodosamensis sensu Ostrowski de Núñez 1974d, 1976a, 1996	*H. piscium*	De la Plata	*C. decemmaculatus*[c]	*Nycticorax nycticorax* Linnaeus, 1758, *B. striatus* and *I. involucris*	Ostrowski de Núñez (1976a)
	Heterophyes yacyretana Ostrowski de Núñez, Quintana & Mercado Laczkó, 2020	*A. chloroticum*	Candelaria, Paraná. *P* = 0.80-1.70	*Corydoras paleatus* (Jenyns, 1842) [c]	*G. gallus* [c]	Ostrowki de Núñez *et al.* (2020)
	Pleurolophocercaria III	*H. australis*	Cangrejo. *P* = 0.44 (±0.38)			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 2.22-10.18			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
		H. parchappii	Nahuel Ruca. *P* = 1.03			Merlo *et al.* (2017)
	Pleurolophocercaria V	*H. australis*	Cangrejo. *P* = 0.11-1			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 0.07-2.70			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
	Pleurolophocercaria VI	*H. australis*	Cangrejo. *P* = 0.33-1.33			Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 1.10-2.40			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011)
		H. parchappii	Carolina Los Padres (Buenos Aires). 37°56', 57°44'.			Merlo *et al.* (2019)
	Pleurolophocercaria VII	*H. conexa*	Mar Chiquita. *P* = 0.07			Etchegoin (1997); Merlo & Etchegoin (2011)
	Pygidiopsis australis Ostrowski de Núñez, 1996	*H. castellanosae*	Zoo	*C. decemmaculatus* [c]	*G. gallus* [c] and *M. musculus* [c]	Ostrowski de Núñez (1996)
	Pygidiopsis crassus Ostrowski de Núñez, 1995	*H. australis*	Cangrejo. *P* = 0.33-1.9			Etchegoin *et al.* (2012); Parietti *et al.* (2013)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
		H. conexa	Mar Chiquita. *P* = 0.11-2.7			Martorelli & Etchegoin (1996); Etchegoin (1997); Merlo & Etchegoin (2011); Etchegoin *et al.* (2012)
		H. parchappii	Tapera Lobería Carolina Los Padres. *P* = 0.20 Luján. *P* = 0.27 Zoo	*J. lineata* [c] and *C. decemmaculatus* [c]	*G. gallus* [c] and *M. musculus* [c]	Ostrowski de Núñez (1995); Merlo *et al.* (2019); Parietti *et al.* (2020)
Paramphistomoidea Fischoeder, 1901						
	Cercaria Amphistoma	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
Paramphistomidae Fischoeder, 1901	Cercaria aff. *Catadiscus uruguayensis* Freitas & Lent, 1939	*D. kermatoides*	Luján	*H. pulchella*, *L. mantidactylus*, *Leptodactylus ocellatus* (Steffen, 1815)		Ostrowski de Núñez (1979b)
Zygocotylidae Ward, 1917	*Zygocotyle lunata* (Diesing, 1836)	*B. peregrina*	Zoo			Ostrowski de Núñez *et al.* (2003)
		B. tenagophila tenagophila	Tres Palmeras. *P* = 4.5 CABA. *P* = 1.4		*G. gallus* [c] and *M. musculus* [c]	Ostrowski de Núñez *et al.* (2011)
Plagiorchioidea Lühe, 1901						
	Cercaria Xiphidiocerca	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Xiphidiocercaria aff. *Travtrema stenocotyle* (Cohn, 1902)	*P. canaliculata*	Luján	*H. pulchella*		Ostrowski de Núñez (1979a)
	Xiphidiocercaria sp. I	*B. peregrina*	Luján			Ostrowski de Núñez (1974c)
	Xiphidiocercaria sp. III	*D. kermatoides*	Luján			Ostrowski de Núñez (1974c)
	Xiphidiocercaria sp. IV	*D. depressissimum*	Paiva. *P* = 1.1			Hamann *et al.* (1993)
	Xiphidiocercaria sp. 2	*B. orbignyi*	Puerta de Díaz. *P* = 0.4	*Rhinella* sp., *P. acuta* and *U. concentricus*		Davies (2014)
		B. tenagophila tenagophila	Tres Palmeras. *P* = 0.4	*Rhinella* sp., *P. acuta* and *U. concentricus*		Davies (2014)
Alloglossidiidae Hernandez-Mena, Mendoza-Garfias, Ornelas-Garcia & Perez-Ponce de Leon, 2016	*Magnivitellinum saltaensis* Davies, Liquin, Lauthier, Párraga, Saravia, Davies & Ostrowski de Núñez, 2021 [b]	*B. orbignyi*[c] *B. tenagophila tenagophila*	Campo Alegre. *P* = 0.6	Larvae of *Aedes aegypti* (Linnaeus, 1762) [c], *Culex* sp.[c] and Ephemeroptera [c]	*G. ternetzi* [c] and *Psalidodon endy*	Davies *et al.* (2021)
Haematoloechidae Freitas & Lent, 1939	Xiphidiocercaria sp. III (cf. *Haematoloechus* sp.)	*D. lucidum*	Paiva. *P* = 1.0-2.4			Hamann *et al.* (1993)
Macroderoididae McMullen, 1937	Xiphidiocercaria sp. A	*B. peregrina*	Carnaval			Morris (1976)
Plagiorchiidae Lühe, 1901	Plagiorchiidae	*Chilina* sp.	La Balsa. *P* = 0.9 Escondido (Río			Quaggiotto & Valverde (1995)

			Negro). 41°05', 71°35'. *P* = 17.8-20.2			
	Xiphidiocercaria	*C. dombeiana*	Mascardi. *P* = 0.3 Escondido. *P* = 18.9 Llum. *P* = 4.3			Flores & Semenas (2008); Veleizán (2009)
		C. gibbosa	Juventus. *P* = 7.8			Veleizán (2009)
		C. neuquenensis	Ruca Malen Correntoso. *P* = 1.3 Espejo. *P* = 0.8			Veleizán (2009)
		Chilina strebeli	Puerto Patriada Epuyen. *P* = 0.4			Veleizán (2009)
		S. hatcheri	Gutiérrez. *P* = 9.0-13.0	*Meridialaris chiloensis* (Demoulin, 1955), *Nousia bella* (Pescador & Peters 1985), *Antarctoperla michaelseni* (Klapálek, 1904) and *Smicridea annulicornis* (Blanchrd, 1851)		Mariluan (2009)
	Xiphidiocercaria gen. sp. 3	*H. parchappii*	Los Padres Nahuel Rucá. *P* = 1.3			Merlo *et al.* (2014; 2017)
	Xiphidiocercaria gen. sp. 4	*H. parchappii*	Nahuel Rucá			Merlo *et al.* (2014)
	Xiphidiocercaria sp. I (=? *Cercaria minense*)	*B. orbignyi*	Basin of Riachuelo			Ostrowski de Núñez *et al.* (1990)
		B. peregrina	Basin of Santa Lucía			Ostrowski de Núñez *et al.* (1990)
		B. straminea	Basin of Riachuelo			Ostrowski de Núñez *et al.* (1990)
Plagiorchiidae or Telorchiidae Looss, 1899	Xiphidiocercarias sp. B	*B. peregrina*	Carnaval			Morris (1976)
Reniferidae Pratt, 1902	Xiphidiocercaria gen. sp. 1	*B. peregrina*	Mar de Cobo. *P* = 1.36			Parietti *et al.* (2015)
	Xiphidiocercaria sp. 1	*H. conexa*	Mar Chiquita			Etchegoin & Martorelli (1998); Merlo & Etchegoin (2011); Etchegoin *et al.* (2012)
	Xiphidiocercaria sp. 2	*H. australis*	Cangrejo. *P* = 0.32			Parietti *et al.* (2013); Etchegoin *et al.* (2012)
		H. conexa	Mar Chiquita. *P* = 0.11-2.24			Etchegoin & Martorelli (1998)
Pronocephaloidea Looss, 1899						
	Cercaria Monostoma	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
Notocotylidae Lühe, 1909	*Catatropis chilinae* Flores & Brugni, 2003	*C. dombeiana*	Escondido. *P* = 1.6 Mascardi. *P* = 1.1-53.4 Lácar. *P* = 4.8 Ñirihuau. *P* = 50 Moreno. *P* = 0.6 Nahuel Huapi. *P* = 8.4 Epuyen. *P* = 6.3 Futalaufquen. *P* = 30	*C. dombeiana*	*G. gallus* [c] *Anas* sp. [c]	Flores & Brugni (2003); Flores & Semenas (2008); Flores *et al.* (2010)

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
			Corintos (cercariae and metacercariae)			
		C. gibbosa	Arelauquen Gutiérrez. *P* = 25.5 Nahuel Huapi. *P* = 4.5 El Dique Gutiérrez. *P* = 24.1 El Trébol. *P* = 31.4 La Playita Puelo. *P* = 3.4 Melipal Nahuel Huapi. *P* = 1.6 Planta Nahuel Huapi. *P* = 1.5 Regatas Nahuel Huapi. *P* = 5.3			Veleizán (2009)
		C. neuquenensis	Camping Correntoso. *P* = 2.5 Guardaparque Espejo. *P* = 61.7 Hotel Espejo. *P* = 8.7 Ruca Malen Correntoso. *P* = 25.5			Veleizán (2009)
		Chilina sp.	Escondido. *P* = 0.77 La Balsa Pond. *P* = 13.5 Rosario. *P* = 3			Quaggiotto & Valverde (1995)
	Catatropis heleobiae Flores & Brugni, 2006	*S. hatcheri*	Nahuel Huapi. *P* = 6.8	*S. hatcheri*	*G. gallus* [c], *Anas* sp. [c]	Flores & Brugni (2006)
	Cercaria Notocotylidae	*D. lucidum*	Paiva. *P* = 0.10			Hamann *et al.* (1993)
	Cercaria Notocotylidae sp. 1	*B. peregrina*	Mar de Cobo. *P* = 0.11-1.83			Parietti *et al.* (2021)
		H. australis	Cangrejo. *P* = 0.31-1			Etchegoin *et al.* (2012); Parietti *et al.* (2013)
		H. conexa	Mar Chiquita. *P* = 2.40-5.19			Martorelli & Etchegoin (1996); Merlo & Etchegoin (2011); Etchegoin *et al.* (2012)
		H. parchappii	Tapera Corrientes Lobería Carolina Los Padres La Brava Nahuel Rucá			Merlo *et al.* (2017; 2019); Parietti *et al.* (2020)
	Hippocrepis fuelleborni Travassos & Vogelsang, 1930	*B. peregrina*	Luján		*M. musculus* [c]	Ostrowski de Núñez (1976b)
	Notocotylidae	*Chilina* sp.				Sanero *et al.* (2018)

			Esquel Miguens Terraplen Willimanco Percey. $P = 11.6$ Grande Corintos. $P = 60$			
		Galba sp.	Willimanco			Sanero *et al.* (2018)
	Notocotylidae gen. sp. [a]	*H. australis*	Bahía Blanca. $P = 0.2$			Alda & Martorelli (2014)
	Notocotylus	*H. parchappii*	Quequén			Szidat & Szidat (1961)
	Notocotylus biomphalariae Flores & Brugni, 2005 [a]	*B. peregrina*	Fantasma. $P = 0.5$-2.5	*B. peregrina*	*G. gallus* [c]	Flores & Brugni (2005)
Notocotylidae or Pronocephalidae Looss, 1899	Cercaria monostoma	*B. peregrina*	Carnaval			Morris (1978)
Schistosomatoidea Stiles & Hassall, 1898						
	Cercaria Lophocerca	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 6	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 7	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
	Furcocercaria N° 8	*B. tenagophila tenagophila*	Salto Grande			Martorelli *et al.* (2013)
Aporocotylidae Odhner, 1912	Cercaria Aporocotylidae gen. sp. 1	*H. australis*	Cangrejo. $P = 0.22$-2			Etchegoin *et al.* (2012); Parietti *et al.* (2013); Merlo *et al.* (2014)
		H. conexa	Mar Chiquita. $P =$ 0.58-2.03			Etchegoin *et al.* (2012)
	Aporocotylidae gen. sp. [a]	*H. australis*	Bahía Blanca. $P = 0.1$			Alda & Martorelli (2014)
	Furcocercaria Sanguinicolidae	*H. australis*	Bahía Blanca			Alda (2011)
Clinostomidae Lühe, 1901	*Clinostomum* sp.	*B. tenagophila tenagophila*	Tres Palmeras. $P =$ 0.45	*A.a borelli* (Regan, 1906) [c] and *Synbranchus marmoratus* (Bloch, 1795) [c]		Davies (2014)
	Cercaria Clinostomidae sp. [a]	*B. tenagophila tenagophila*	Agricultural area. $P =$ 0.02			Fernández (2014)
		B. tenagophila occidentalis	Suburban area. $P =$ 0.38			Fernández *et al.* (2016)
Schistosomatidae Stiles & Hassall, 1898	Cercaria I	*P. acuta*	Luján			Ostrowski de Núñez (1977b)
	Cercaria II	*P. canaliculata*	Luján			Ostrowski de Núñez (1977b)
	Cercaria chascomusi	*H. parchappii*	Chascomús			Szidat (1958)
	Cercaria chilinae 1	*Chilina fluviatilis*	Delta Paraná			Szidat (1951)
	Cercaria chilinae 2	*C. fluviatilis*	Delta Paraná			Szidat (1951)
	Cercaria heleobicola I	*H. conexa*				

(*Continued*)

Table 2. (*Continued.*)

Superfamily/family	Species	First intermediate molluscan host	Location/prevalence (%)	Second intermediate host	Definitive host	References
			Mar Chiquita. *P* = 0.1-0.5			Martorelli (1989b); Merlo & Etchegoin (2011)
	Cercaria planorbicola	*B. peregrina*	Quequén			Szidat & Szidat (1960)
	Cercaria quequeni	*B. peregrina*	Quequén			Szidat (1951)
	Cercaria Schistosomatidae gen. sp. 1	*H. parchappii*	Nahuel Rucá			Merlo *et al.* (2014)
	Cercaria Schistosomatidae gen. sp. 1B	*B. peregrina*	Mar de Cobo. *P* = 1.6-2.8			Parietti (2018); Parietti *et al.* (2021)
	Furcocercaria sp. 6	*B. orbignyi*	Puerta de Díaz. *P* = 0.1			Davies (2014)
	Furcocercaria sp. XVIII	*B. straminea*	Agricultural area. *P* = 0.11			Fernández *et al.* (2013)
	Nasusbilharzia melancorhypha Flores, Viozzi, Casalins, Loker & Brant 2021 [b]	*C. gibbosa*	Pellegrini. *P* = 0.7 Mari Menuco Nahuel Huapi. *P* = 1		*Cygnus melancoryphus* (Molina, 1782)	Flores *et al.* (2015); Flores *et al.* (2021)
	Schistosomatidae	*C. dombeiana*	Escondido. *P* = 3.3 Llum. *P* = 10.5			Quaggiotto & Valverde (1995); Veleizán (2009)
		C. gibbosa	Melipal Nahuel Huapi. *P* = 8.2 Regatas Nahuel Huapi. *P* = 4.9 La Playita Puelo. *P* = 1.9 Arelauquen Gutiérrez. *P* = 19.1 Bahía Gutiérrez. *P* = 59.7 El Dique Gutiérrez. *P* = 3.1 Pellegrini (Río Negro)			Veleizán (2009)
		C. neuquenensis	Correntoso. *P* = 9.9 Espejo. *P* = 1.4-4.2 Ruca Malen Correntoso. *P* = 15.2			Veleizán (2009)
		Chilina sp.	Gutiérrez. *P* = 23.1 Las Mercedes. *P* = 95.5			Quaggiotto & Valverde (1995); Velizán (2009)
		Chilina strebeli	Puerto Patriada Epuyen. *P* = 4.9			Martorelli (1984)
	Schistosome Cercariae Lineage 1 [b]	*C. gibbosa*	Nahuel Huapi. *P* = 1 Pellegrini. *P* = 0.7			Flores *et al.* (2015)
	Schistosome Cercariae Lineage 2 [b]	*C. gibbosa*	Pellegrini. *P* = 3 Puelo. *P* = 1.3 La Larga. *P* = 10			Flores *et al.* (2015)
		C. fulgurata	Senguer. *P* = 4			Flores *et al.* (2015)
		Chilina perrieri				Flores *et al.* (2015)

			Musters. $P = 1.33$ Santa Cruz. $P = 4$		
	Schistosome Cercariae Lineage 3 [b]	*C. dombeiana*	Mascardi. $P = 5$		Flores *et al.* (2015)
		C. gibbosa	Espejo. $P = 5$ Patagua. $P = 33$		Flores *et al.* (2015)
		C. neuquenensis	Correntoso. $P = 2.5$		Flores *et al.* (2015)
		Chilina parchappii	Quequén. $P = 4.4$		Flores *et al.* (2015)
	Trichobilharzia sp.	*B. tenagophila tenagophila*	Tres Palmeras. $P = 0.2$		Davies (2014)
Spirorchiidae Stunkard, 1921	Cercaria Spirorchiidae sp. [a]	*B. tenagophila tenagophila*	Suburban area. $P =$ 0.65		Fernández *et al.* (2016)
		B. tenagophila occidentalis	Suburban area. $P =$ 0.38		Fernández *et al.* (2016)
Undetermined					
	Cercaria Collaris	*R. variabilis*	De la Plata		Castellanos & Gluzman de Pascar (1969)
	Metacercaria sp. 4		Puerta de Díaz. $P =$ 1.06	*B. orbignyi*	Davies (2014)
	Metacercaria sp. 9		Puerta de Díaz. $P = 0.1$	*B. orbignyi*	Davies (2014)
	Xiphidiocercaria sp. II	*B. straminea*	Basin of Riachuelo. P (cercariae) = 0.2-0.9	*P. acuta*[c], *B. straminea*, *B.a tenagophila tenagophila*, *B. tenagophila occidentalis* and *P. canaliculata*	Ostrowski de Núñez *et al.* (1991)
	Xiphidiocercaria sp. V (cf. *Cercaria lutzi*)	*B. tenagophila occidentalis*	Paiva. $P = 0.10$		Ostrowski de Núñez *et al.* (1991)

[a]material deposited.
[b]genetic sequence deposited.
[c]experimental host.
[d]natural and experimental host.

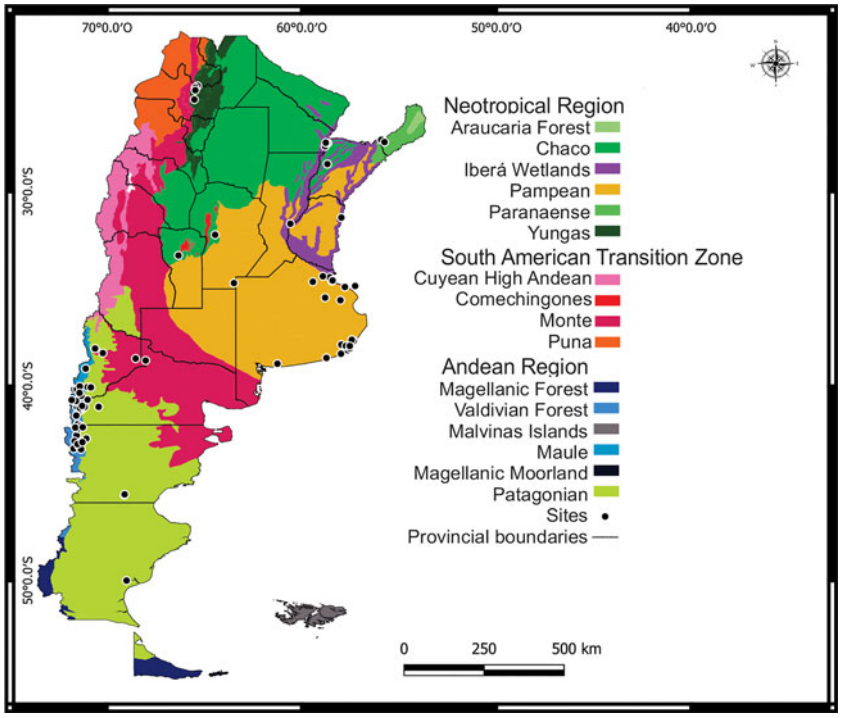

Fig. 1. Map showing locations with the larval digeneans registered in the bibliographical survey in Argentina.

to eight of the 16 biogeographical provinces in Argentina (fig. 1 and supplementary table S1). Only 45 (21.1%) digeneans were identified to species level and 18 (8.5%) to generic level. In addition, only 10 species (4.7%) have genetic sequences deposited in the GenBank. The most represented family was Echinostomatidae, with 36 records. It is followed by the families Schistosomatidae (18 taxa), Heterophyidae (17 taxa), Strigeidae (16 taxa), and Diplostomidae (14 taxa). A total of 40 out of 213 records have known the life cycle (13 natural cycles and 27 experimental cycles).

Of the total molluscan hosts, 31 were gastropods and three bivalves. Among the gastropods, 18 species were first intermediate hosts only, 12 were first and second intermediate hosts, five were second intermediate hosts only, and one species was first and definitive host. With regard to the bivalves, two acted as first intermediate hosts, and one as second intermediate host. The molluscs of the genera *Heleobia* and *Biomphalaria* showed the highest levels of infection and the highest number of digeneans (table 1). The other mollusc genera acted as hosts of less than 10 digenean species.

Discussion

In Argentina, the first studies on larval stages of digeneans using freshwater snails were carried out almost 100 years ago. The first record included in this checklist was made by Bacigalupo (1930) on *F. hepatica*. Later, Szidat (1951) described a new cercaria species. Both studies involved digenean species of zoonotic importance in the region. As shown in this checklist, subsequent studies have described 213 larval digeneans belonging to 35 families. Historically, taxonomic determination has been made based on morphology and it has been assumed that digeneans were specific to first intermediate hosts. However, we consider that the parasites described and reported here probably correspond to more than 213 species of digeneans. There is possible plasticity in morphological characters across hosts in different environments, as well as the presence of cryptic species in a snail host, and the possibility of multiple mollusc species as first intermediate hosts.

This study is the second checklist of larval digeneans in molluscan hosts in Argentina. The first one focused only on marine digeneans and reported 31 species of parasites in 20 species of molluscs (Bagnato *et al.*, 2015). In addition, two previous checklists recorded larval digeneans in both marine and freshwater molluscan hosts in South America. In Chile, four digenean species have been identified in the freshwater snail *Chilina dombeyana*, and five species in marine gastropods and bivalves (Muñoz & Olmos, 2008). In Brazil, Pinto & De Melo (2013) recorded 102 cercaria species in 60 molluscan species.

Based on this research, three aspects should be improved in the study of larval digeneans in freshwater environments, namely distribution, use of taxonomic tools and host taxonomy. Firstly, the distribution of records is uneven; records were available for only eight of the 16 biogeographical provinces proposed by Arana *et al.* (2021). This could be explained by several factors, namely the extent of the Argentine territory, the scarce funding allocated to biodiversity, and the cost of travel. Thus, data are mainly recorded close to the centres where researchers carry out their activities. In addition, some water bodies are located in private fields or protected areas that are difficult to access. The second aspect relates to the use of current molecular tools to determine the gene sequences of cercariae. As mentioned above, only 21.1% of the cercariae found have been classified to species level and only 4.7% have been sequenced. Therefore, it is necessary to increase the use of molecular tools to identify cercariae to species level, determine the existence of cryptic species and better understand the biology of this group. Finally, the third aspect to improve is the diversity of hosts examined. According to Rumi *et al.* (2008), 166 species of freshwater molluscs (101 gastropod and 65 bivalve species) have been reported in Argentina, but only 34 gastropod and three bivalve species have been examined

https://doi.org/10.1017/S0022149X2100081X Published online by Cambridge University Press

for parasites over almost 100 years. There should be more collaboration with malacologists to improve the identification of both the larval digeneans and their molluscan hosts.

It is noteworthy that all of the authors included in the checklist who carried out studies in freshwater and marine environments in South America (Muñoz & Olmos, 2008; Pinto & De Melo, 2013; Bagnato *et al.*, 2015) have mentioned these three aspects. In addition, the procedure of collecting, describing and classifying cercariae is time-consuming and requires both training and adequate equipment. Therefore, in order to deepen the knowledge about the diversity and distribution of digeneans, researchers should work together, unifying efforts and minimising costs.

Considering the limited knowledge about life cycles of digeneans, the information presented here may have wider implications, mainly for neighbouring countries to Argentina such as Chile, Uruguay, Paraguay, Bolivia and Brazil. Most of the molluscan hosts recorded are also present in these countries, and some of them are of health and zoonotic interest. For instance, the genus *Biomphalaria* is found in Brazil (Ciccheto *et al.*, 2021; Mesquita *et al.*, 2021; among others) and *F. hepatica* is present in Bolivia and Brazil (Mas-Coma *et al.*, 2020; Schwantes *et al.*, 2020; Silva *et al.*, 2020; among others). Moreover, some of the birds and mammals that act as definitive hosts, such as *Otaria flavescens* in Chile and Brazil (Pereira *et al.*, 2013; Hermosilla *et al.*, 2018), and *Laurus dominicanus* in Chile (Gonzalez-Acuna *et al.*, 2009), are known to migrate in the southern part of the American continent. Cosmopolitan host species such as *Physella acuta* (Lawton *et al.*, 2018; Pantoja *et al.*, 2021) and migratory bird species from other continents are also in the checklist, making the present work of potential global interest. For instance, many migratory shorebirds of the families Charadriidae and Scolopacidae breed in the tundra of the Northern Hemisphere, and then migrate southwards to spend the non-breeding period in coastal and inland wetlands of South and Central America. These bird families have been reported in inland wetlands and temporary artificial wetlands such as flooded rice fields in northeastern Argentina (Blanco *et al.*, 2006; Blanco & De la Balze, 2011).

In view of the presence of common intermediate and definitive hosts and the biogeographical characteristics shared by South American countries, it is necessary to carry out studies at the regional level to understand the factors that determine the spatial and temporal dynamics of digeneans, as well as to elucidate their life cycles. Furthermore, larval digenean assemblages in freshwater molluscs should be studied in greater depth, as our results reveal a fertile field for future studies on taxonomy, diversity conservation, ecology, health and zoonoses. In addition, molecular tools should be used to complement morphological descriptions for better taxonomic identification.

Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/S0022149X2100081X

Acknowledgements. The authors thank Matías Paredes Davies for his collaboration in the preparation of the distribution map, Florencia Liquín for her help in the preparation of the first table (data from Salta), and to the Asociación Parasitológica Argentina for the space provided for the first freshwater digeneans conference. A special thanks to Margarita Ostrowski de Núñez for her comments and helpfulness to send the bibliography, and especially for all the work done in the determination of larval digeneans in Argentina.

Financial support. Financial support was received from Universidad Nacional de Salta (Grant number 2481/0 CIUNSa to D.D.), from ANPCyT (PICT 2017- 1819 to J.A.E.), from Universidad Nacional de Mar del Plata (Grant number 15/E935 EXA997/20 to J.A.E) and from Universidad Nacional del Comahue (Grant number B225 to V.F.)

Conflicts of interest. None.

Ethical standards. Not applicable.

Authors' contribution. All authors contributed to the work conceiving, conducting data gathering, performing statistical analyses and writing the article.

References

Alda P (2011) *Estadios larvales de digeneos parásitos de Heleobia australis (d'Orbigny 1835) en el estuario de Bahía Blanca* [Larval stages of digenean parasites of *Heleobia australis* (d'Orbigny 1835) in the estuary of Bahía Blanca]. Phd thesis, Universidad Nacional del Sur, Argentina. [In Spanish.]

Alda P and Martorelli S (2014) Larval trematodes infecting the South-American intertidal mud snail *Heleobia australis* (Rissooidea: Cochliopidae). *Acta Parasitologica* **59**(1), 50–67.

Alda P, Bonel N, Hechinger RF and Martorelli SR (2013) *Maritrema orensense* and *Maritrema bonaerense* (Digenea: Microphallidae): descriptions, life cycles, and comparative morphometric analyses. *Journal of Parasitology* **99**(2), 218–228.

Alda P, Bonel N, Panei CJ, Cazzaniga NJ and Martorelli SR (2015) First molecular identification of *Ascocotyle* (*Phagicola*) *longa* in its first intermediate host the mud snail *Heleobia australis*. *Acta Parasitologica* **60**(4), 791–795.

Arana MD, Natale E, Ferretti NE, Romano GM, Oggero AJ, Martínez G, Posadas PE and Morrone JJ (2021) *Esquema biogeográfico de la República Argentina* [Biogeographical scheme of the Argentine Republic]. 1st ed. Tucumán, Fundación Miguel Lillo. p. 238. [InSpanish.]

Bacigalupo JL (1930) La *lymnaea viatrix* d'Orbigny, huésped intermediario de la *Fasciola hepatica* L. en la República Argentina [*Lymnaea viatrix* d'Orbigny, intermediate host of *Fasciola hepatica* L. in the Argentine Republic]. *La Semana Médica Buenos Aires* **37**(46), 1481–1484. [In Spanish.]

Bacigalupo JL (1932) Superposición de la distribución geográfica de *Fasciola hepatica* L. y *lymnaea viatrix* d'Orbigny en la República Argentina [Overlapping geographical distribution of *Fasciola hepatica* L. and *Lymnaea viatrix* d'Orbigny in the Argentine Republic]. *Revista Sociedad Argentina de Biología* **8**, 556–558. [In Spanish.]

Bagnato E, Gilardoni C, Di Giorgio G and Cremonte F (2015) A checklist of marine larval trematodes (Digenea) in molluscs from Argentina, Southwestern Atlantic coast. *Check List* **11**(4), 1–10.

Blanco DE and De la Balze BM (2011) *Conservación de los recursos acuáticos y de la biodiversidad en arroceras del nordeste de Argentina* [Conservation of aquatic resources and biodiversity in rice fields in northeastern Argentina]. Buenos Aires, Argentina, Fundación Humedales/Wetlands International. p. 97. [In Spanish.]

Blanco DE, López-Lanús B, Dias RA, Azpiroz A and Rilla G (2006) *Uso de las arroceras por chorlos y playeros migratorios en el sur de América del Sur. Implicancias de conservación y manejo* [Use of rice fields by migratory plovers and shorebirds in southern South America. Conservation and management implications]. Buenos Aires, Argentina, Wetlands International. p. 56. [In Spanish.]

Bray RA, Gibson DI and Jones A (2008) *Keys to the trematoda, Vol. 3*. 1st ed. Wallingford UK, the Natural History Museum, London, UK, CABI Publishing. p. 824.

Carnevale S, Malandrini JB, Pantano ML, Sawicki M, Kamenetzky L, Soria CC and Velásquez JN (2021) Use of the PCR in a combined methodological approach for the study of human fascioliasis in an endemic area. *Acta Parasitologica* **66**(2), 455–460.

Castellanos Z and Gluzman de Pascar C (1969) Nuevas cercarias de *Diplodon variabilis* [New cercariae of *Diplodon variabilis*]. *Neotrópica* **15(46)**, 43–48. [In Spanish.]

Ciccheto JRM, Stabile BHM, Fermino F, Fabrin TMC, de Oliveira AV, Takemoto RM and da Graça RJ (2021) Molecular evidence of new freshwater turtle blood flukes (Digenea: Spirorchiidae) in the intermediate snail host *Biomphalaria occidentalis* Paraense, 1981 in an urban aquatic ecosystem in Brazil. *Parasitology Research* **120**(1), 133–143.

Cutellé MA (1998) *Estudios sobre el ciclo de vida y la identidad de* Psilochasmus oxyurus *(Trematoda: Psilostomidae) citado para Argentina* [Studies on the life cycle and identity of *Psilochasmus oxyurus* (Trematoda: pPsilostomidae) cited for Argentina]. Grade thesis, Universidad Nacional de Buenos Aires, Argentina. [In Spanish.]

Davies D (2014) *Digenea (Trematoda, Plathelminthes) parásitos de* Biomphalaria *spp., en el valle de Lerma, provincia de Salta* [Digenea (Trematoda, Plathelminthes) parasites of *Biomphalaria* spp., in the Lerma valley, province of Salta]. Phd thesis, Universidad Nacional de Salta, Argentina. [In Spanish.]

Davies D and Ostrowski de Núñez M (2012) The life cycle of *Australapatemon magnacetabulum* (Digenea: Strigeidae) from northwestern Argentina. *Journal of Parasitology* **98**(4), 778–783.

Davies D, Davies C, Lauthier JJ, Hamann M and Ostrowski de Núñez M (2015) Morphological and ITS2 molecular characterization of *Ribeiroia* cercariae (Digenea: Psilostomidae) from *Biomphalaria* spp. (Gastropoda: Planorbidae) in northern Argentina. *Journal of Parasitology* **101**(5), 549–555.

Davies D, Liquín F, Lauthier JJ, Párraga R, Saravia J, Davies C and Ostrowski de Núñez M (2021) The life cycle of *Magnivitellinum saltaensis* n. sp. (Digenea: Alloglossidiidae) in Salta Province, Argentina. *Parasitology Research* **120**(4), 1233–1245.

Dellagnola FA, Montes MM, Martorelli SR and Vega IA (2019) Morphological characterization and molecular phylogeny of zoonotic trematodes in the freshwater snail *Asolene platae*. *Parasitology* **146**(7), 839–848.

Dos Santos DA, Domínguez E, Miranda MJ, Gutiérrez Gregoric D and Cuezzo MG (2020) The relevance of ecoregions and mountainous environments in the diversity and endemism of land gastropods. *Progress in Physical Geography* **45**(2), 1–25.

Etchegoin JA (1997) *Sistemas parasitarios presentes en la albufera Mar Chiquita* [Parasitic systems present in the Mar Chiquita lagoon]. Phd thesis, Universidad Nacional de Mar del Plata, Argentina. [In Spanish.]

Etchegoin JA and Martorelli SR (1997) Description of a new species of *Maritrema* (Digenea: Microphallidae) from Mar Chiquita coastal lagoon (Buenos Aires, Argentina) with notes on its life cycle. *Journal of Parasitology* **83**(4), 709–713.

Etchegoin JA and Martorelli SR (1998) Nuevas cercarias en *Heleobia conexa* (Mollusca: Hydrobiidae) de la albufera Mar Chiquita [New cercariae in *Heleobia conexa* (Mollusca: Hydrobiidae) from the Mar Chiquita lagoon]. *Neotropica* **44(1)**, 41–50. [In Spanish.]

Etchegoin JA, Merlo MJ and Parietti M (2012) The role of the invasive polychaete *Ficopomatus enigmaticus* (Fauvel, 1923) (Serpulidae) as facilitator of parasite transmission in Mar Chiquita coastal lagoon (Buenos Aires, Argentina). *Parasitology* **139**(11), 1506–1512.

Fernández MV (2014) *Ecología y sistemática de trematodes larvales parásitos en especies del género* Biomphalaria *(Mollusca: Planorbidae) en ambientes contrastantes de la provincia de Corrientes, Argentina* [Ecology and systematics of parasitic larval trematodes in species of the genus *Biomhalaria* (Mollusca: Planorbidae) in contrasting environments of the province of Corrientes, Argentina]. Phd thesis, Universidad Nacional del Nordeste, Argentina. [In Spanish.]

Fernández MV and Hamann MI (2017) Cercariae (Digenea: Strigeidae, Diplostomidae) in *Biomphalaria straminea* (Planorbidae) from a rice field in northeastern Argentina. *Revista de Biología Tropical* **65**(2), 551–563.

Fernández MV, Hamann MI and Ostrowski de Núñez M (2013) Larval trematodes of *Biomphalaria straminea* (Mollusca: Planorbidae) in a ricefield in Corrientes Province, Argentina. *Revista Mexicana de Biodiversidad* **84**(3), 756–764.

Fernández MV, Hamann MI and Ostrowski de Núñez M (2014) Echinostome cercariae from *Biomphalaria straminea* (Mollusca: Planorbidae) in a ricefield from northeastern Argentina. *Revista Mexicana de Biodiversidad* **85(4)**, 1024–1031.

Fernández MV, Hamann MI and Ostrowski de Núñez M (2016) New larval trematodes in *Biomphalaria* species (Planorbidae) from northeastern Argentina. *Acta Parasitologica* **61**(3), 471–492.

Flores VR and Brugni N (2003) *Catatropis chilinae* n. sp. (Digenea: Notocotylidae) from *Chilina dombeiana* (Gastropoda: Pulmonata) and notes on its life-cycle in Patagonia, Argentina. *Systematic Parasitology* **54**(2), 89–96.

Flores VR and Brugni N (2005) *Notocotylus biomphalariae* n. sp. (Digenea: Notocotylidae) from *Biomphalaria peregrina* (Gastropoda: Pulmonata) in Patagonia, Argentina. *Systematic Parasitology* **61**(3), 207–214.

Flores VR and Brugni N (2006) *Catatropis hatcheri* n. sp. (Digenea: Notocotylidae) from *Heleobia hatcheri* (Prosobranchia: Hydrobiidae) and notes on its life-cycle in Patagonia, Argentina. *Systematic Parasitology* **63** (2), 109–116.

Flores VR and Semenas LG (2008) Larval digenean community parasitizing the freshwater snail, *Chilina dombeyana* (Pulmonata: Chilinidae) in Patagonia, Argentina, with special reference to the notocotylid *Catatropis chilinae*. *Journal of Parasitology* **94**(2), 305–313.

Flores VR and Semenas LG (2016) Advances in the knowledge of *Echinoparyphium megacirrus* and *Echinostoma* sp. (Digenea: Echinostomatidae) parasites of *Diplodon chilensis* (Pelecypoda) in Patagonia (Argentina). *Revista Argentina de Parasitología* **5(1)**, 11–20.

Flores VR, Semenas LG and Veleizán AA (2010) Larval digenean community parasitizing the freshwater snail, *Biomphalaria peregrina* (Pulmonata: Planorbidae), from a temporary pond in Patagonia, Argentina. *Journal of Parasitology* **96**(3), 652–656.

Flores VR, Brant SV and Loker ES (2015) Avian schistosomes from the South American endemic gastropod genus *Chilina* (Pulmonata: Chilinidae), with a brief review of South American schistosome species. *Journal of Parasitology* **101**(5), 565–576.

Flores VR, Viozzi G, Casalins L, Loker ES and Brant SV (2021) A new schistosome (Digenea: Schistosomatidae) from the nasal tissue of South America black-necked swans, *Cygnus melancoryphus* (Anatidae) and the endemic pulmonate snail *Chilina gibbosa*. *Zootaxa* **4948**(3), 404–418.

Gibson DI, Jones A and Bray RA (2002) *Keys to the Trematoda, Vol. 2*. 1st ed. Wallingford UK, the Natural History Museum, London, UK, CABI Publishing. p. 768

Gonzalez-Acuna D, Cerda F, Lopez J, Ortega R, Mathieu C and Kinsella M (2009) Checklist of the helminths of the kelp gull, *Larus dominicanus* (Aves: Laridae), with new records from Chile. *Zootaxa* **2297**(1), 27–43.

Graefe G (1970) Comportamiento poco común de una cercaria perteneciente a la familia Haploporidae en la Argentina [Unusual behavior of a cercaria belonging to the family Haploporidae in Argentina]. *Revista del Instituto Académico de Investigaciones en Ciencias Naturales Y Zoología* **6(1)**, 101–104. [In Spanish.]

Hamann MI, Rumi A and Ostrowski de Núñez M (1993) Aspectos biológicos sobre los parásitos y la dinámica poblacional de *Drepanotrema* spp. (Mollusca, Planorbidae) en un biotopo lenítico del nordeste argentino [Biological aspects of parasites and population dynamics of *Drepanotrema* spp. (Mollusca, Planorbidae) in a lenitic biotope of northeastern Argentina]. *Ambiente Subtropical* **3(1)**, 19–38. [In Spanish.]

Hermosilla C, Hirzmann J, Silva LM, Scheufen S, Prenger-Berninghoff E, Ewers C and Taubert A (2018) Gastrointestinal parasites and bacteria in free-living South American sea lions (*Otaria flavescens*) in Chilean comau fjord and new host record of a *Diphyllobothrium scoticum*-like cestode. *Frontiers in Marine Science* **5**, 459.

Jones A, Bray RA and Gibson DI (2005) *Keys to the Trematoda, 1*. 1st ed. Wallingford UK, the Natural History Museum, London, UK, CABI Publishing. p. 733.

Kleiman F, Pietrokovsky S, Paraense WL and Wisnivesky-Colli C (2004) Southernmost finding of *Lymnaea viatrix* orbigny, 1835 (Pulmonata: Lymnaeidae), intermediate host of *Fasciola hepatica* (Linnaeus, 1758) (Trematoda: Digenea), in urban and rural areas of Patagonia, Argentina. *Memórias do Instituto Oswaldo Cruz* **99**(1), 23–24.

Lawton SP, Allan F, Hayes PM and Smit NJ (2018) DNA barcoding of the medically important freshwater snail *Physa acuta* reveals multiple invasion events into Africa. *Acta Tropica* **188**(1), 86–92.

Liquin F, Gilardoni C, Cremonte F, Saravia J, Cristóbal H and Davies D (2022) A new species of *Auriculostoma* (Digenea: Allocreadiidae) in

South America: life cycle and phylogenetic relationships. *Anais da Academia Brasileira de Ciências* **94**(1), e20200538.

Lockyer AE, Jones CS, Noble LR and Rollinson D (2004) Trematodes and snails: an intimate association. *Canadian Journal of Zoology* **82**(2), 251–269.

Loker E and Hofkin B (2015) *Parasitology: A conceptual approach*. New York, Garland Science, Taylor & Francis Group. p. 560.

López Armengol MF and Martorelli SR (1997) A new larval trematode (Haploporidae) in the hydrobiid snail *Potamolithus agapetus* Pilsbry, 1911: prevalence, intensity, distribution, and the effects on the snail morphology. *Neotropica* **43**(1), 89–99.

Mariluan GD (2009) *Los insectos bentónicos del arroyo Gutiérrez (San Carlos de Bariloche) como hospedadores intermediarios de Plagiorchiformes (Digenea)* [The benthic insects of the Gutiérrez stream (San Carlos de Bariloche) as intermediate hosts of Plagiorchiformes (Digenea)]. Grade thesis, Universidad Nacional del Comahue, Argentina. [In Spanish.]

Martorelli SR (1984) Sobre una cercaria de la familia Schistosomatidae (Digenea) parásita de *Chilina gibbosa* Sowerby, 1841 en el lago Pellegrini, Provincia de Río Negro, República Argentina [On a cercaria of the family Schistosomatidae (Digenea) parasitic on *Chilina gibbosa* Sowerby, 1841 in Lake Pellegrini, Río Negro Province, Argentine Republic]. *Neotrópica* **30** (83), 97–106. [In Spanish.]

Martorelli SR (1985) Estudios parasitológicos en biotopos iénticos de la República Argentina 1: el ciclo biológico de *Echinochasmus talaensis* sp. nov. (Digenea) parásita de *Pirangurus bolivianus* (Aves: Tyrannidae) [Parasitological studies in identical biotopes of the Argentine Republic 1: the biological cycle of *Echinochasmus talaensis* sp. nov. (Digenea) parasite of *Pirangurus bolivianus* (Aves: Tyrannidae)]. *Neotrópica* **31**(86), 187–200. [In Spanish.]

Martorelli SR (1986a) Estudios parasitológicos en biotipos lénticos de la República Argentina 11: el ciclo biológico de *Homalometron pseudopallidum* sp. nov. (Digenea) parásito de *Gymnogeophagus australis* (Eigenmann, 1907) (Pisces: Cichlidae) [Parasitological studies in lentic biotypes of the Argentine Republic 11: the biological cycle of *Homalometron pseudopallidum* sp. nov. (Digenea) parasite of *Gymnogeophagus australis* (Eigenmann, 1907) (Pisces: Cichlidae)]. *Neotrópica* **32**(87), 3–12. [In Spanish.]

Martorelli SR (1986b) Estudios parasitológicos en biotopos lénticos de la república Argentina: el ciclo biológico de *Saccocoelioides carolae lunaschi* (Digenea) parásito de *Cichlasoma facetum* (Jenyns, 1842) (Pisces: Cichlidae) [Parasitological studies in lentic biotopes of the Argentine Republic: the biological cycle of *Saccocoelioides carolae lunaschi* (Digenea) parasite of *Cichlasoma facetum* (Jenyns, 1842) (Pisces: Cichlidae)]. *Neotrópica* **32**(88), 125–132. [In Spanish.]

Martorelli SR (1986c) Estudio sistemático y biológico de un digeneo perteneciente a la familia Microphallidae Travassos, 1920. I: *Microphallus szidati* sp. nov. parásito intestinal de *Rallus sanguinolentus sanguinolentus* (Aves: Rallidae) e *Himantopus melanurus* (Aves: Recurvirrostridae) [Systematic and biological study of a digenean belonging to the family Microphallidae Travassos, 1920. I: *Microphallus szidati* sp. nov. intestinal parasite of *Rallus sanguinolentus sanguinolentus* (Aves: Rallidae) and *Himantopus melanurus* (Aves: Recurvirrostridae)]. *Revista Ibérica de Parasitología* **46**(4), 373–378. [In Spanish.]

Martorelli SR (1987) Estudio parasitológico en biotopos lénticos de la República Argentina. IV. el ciclo biológico de *Echinostoma parcespinosum* Lutz, 1924 (Digenea) parásito de *Rallus maculatus* y *Rallus sanguinolentus* (Aves: Rallidae) [Parasitological study in lentic biotopes of the Argentine Republic. IV. the biological cycle of *Echinostoma parcespinosum* Lutz, 1924 (Digenea) parasite of *Rallus maculatus* and *Rallus sanguinolentus* (Aves: Rallidae)]. *Revista del Museo de La Plata* **14**(153), 47–63. [In Spanish.]

Martorelli SR (1988) El ciclo biológico de *Levinseniella cruzi* Travassos, 1920 (Digenea, Microphallidae) parásita de los ciegos cólicos de *Rollandia rolland chilensis* (Aves, Podicipedidae) e *Himantopus melanurus* (Aves, Recurvirostridae) [The biological cycle of *Levinseniella cruzi* Travassos, 1920 (Digenea, Microphallidae) parasite of the colicky caeca of *Rollandia rolland chilensis* (Aves, Podicipedidae) and *Himantopus melanurus* (Aves, Recurvirostridae)]. *Iheringia* **68**(1), 49–62. [In Spanish.]

Martorelli SR (1989a) Estudios parasitológicos en biotopos lénticos de la República Argentina y desarrollo del ciclo biológico monoxeno de la metacercaria progenética de *Genarchella* Travassos, 1928 (Digenea, Hemiuridae) parásita de *Littoridina parchappei* (Mollusca, Hidrobiidae) [Parasitological studies in lentic biotopes of the Argentine Republic and development of the monoxene biological cycle of the progenetic metacercaria of *Genarchella* Travassos, 1928 (Digenea, Hemiuridae) parasite of *Littoridina parchappei* (Mollusca, Hidrobiidae)]. *Revista del Museo de La Plata* **XIV** (157), 109–117. [In Spanish.]

Martorelli SR (1989b) Estudios parasitológicos en la albufera de Mar Chiquita, provincia de Buenos Aires, República Argentina. 11: Cercarias (Digenea) parásitas de *Heleobia conexa* (Mollusca: Hydrobiidae), pertenecientes a las familias Schistosomatidae, Haploporidae y Homalometridae [Parasitological studies in the Mar Chiquita lagoon, Buenos Aires province, Argentine Republic. 11: Cercariae (Digenea) parasitic on *Heleobia conexa* (Mollusca: Hydrobiidae), belonging to the families Schistosomatidae, Haploporidae and Homalometridae]. *Neotrópica* **35**(94), 81–91. [In Spanish.]

Martorelli SR (1990) Estudios parasitológicos en la albufera de Mar Chiquita, provincia de Buenos Aires, República Argentina: sobre dos cercarias parásitas de *Heleobia conexa* (Mollusca: Hydrobiidae) pertenecientes a la superfamilia Echinostomatoidea [Parasitological studies in the Mar Chiquita lagoon, Buenos Aires province, Argentine Republic: study of two parasitic cercariae of *Heleobia conexa* (Mollusca: Hydrobiidae) belonging to the Echinostomatoidea superfamily]. *Neotrópica* **36**(95), 55–63. [In Spanish.]

Martorelli SR (1991) El ciclo biológico abreviado de *Microphallus simillimus* (Travassos, 1920), comb. n. (Digenea: Microphallidae), parásito de *Heleobia conexa* (Molusca, Hydrobiidae) y de *Himantopus melanurus* (Aves, Recurvirostridae) en Argentina [The abbreviated biological cycle of *Microphallus simillimus* (Travassos, 1920), comb. n. (Digenea: Microphallidae), parasite of *Heleobia conexa* (Molusca, Hydrobiidae) and *Himantopus melanurus* (Aves, Recurvirostridae) in Argentina]. *Iheringia, Série Zoologia* **71**(1), 91–98. [In Spanish.]

Martorelli SR (1994) Una nueva cercaria de tipo cystophorous (Digenea, Hemiuriformes) en *Potamolithus agapetus* (Mollusca, Hydrobiidae): comportamiento de atracción del hospedador [A new cystophorous-type cercariae (Digenea, Hemiuriformes) in *Potamolithus agapetus* (Mollusca, Hydrobiidae): host attraction behaviour]. *Iheringia* **76**(1), 15–19. [In Spanish.]

Martorelli SR and Etchegoin JA (1996) Cercarias de la superfamilia Opisthorchioidae en *Heleobia conexa* (Mollusca: Hydrobiidae) de la albufera de Mar Chiquita [Cercariae of the superfamily Opisthorchioidae in *Heleobia conexa* (Mollusca: Hydrobiidae) from the Mar Chiquita lagoon]. *Neotrópica* **42**(1), 61–68. [In Spanish.]

Martorelli SR, Alda P, Marcotegui P, La Sala LF and Montes MM (2013) Larval digeneans in *Biomphalaria* snails from the Salto Grande Dam area in the Uruguay River [Larval digeneans in *Biomhalaria* snails from the Salto Grande Dam area in the Uruguay River]. *Publicación del Laboratorio de Helmintos y Parásitos de Crustáceos del CEPAVE* **13**(1), 1–13. [In Spanish.]

Mas-Coma S, Buchon P, Funatsu IRK, Angle R, Artigas P, Valero MA and Bargues Castelló MD (2020) Sheep and cattle reservoirs in the highest human fascioliasis hyperendemic area: experimental transmission capacity, field epidemiology and control within a one health initiative in Bolivia. *Frontiers in Veterinary Science* **7**, 841.

Merlo MJ (2014) *Ecología de las comunidades de digeneos larvales en hospedadores moluscos del género* Heleobia *Stimpson, 1865 (Gastropoda: Rissooidea)* [Ecology of larval digenean communities in mollusc hosts of the genus *Heleobia* Stimpson, 1865 (Gastropoda: Rissooidea)]. Phd thesis, Universidad Nacional de Mar del Plata, Argentina. [In Spanish.]

Merlo MJ and Etchegoin JA (2011) Testing temporal stability of the larval digenean community in *Heleobia conexa* (Mollusca: Cochliopidae) and its possible use as an indicator of environmental fluctuations. *Parasitology* **138**(2), 249–256.

Merlo MJ, Parietti M and Etchegoin JA (2014) Digeneos larvales de *Heleobia parchappii* y de *Heleobia australis* en ambientes dulceacuícolas y estuariales de la provincia de Buenos Aires (Argentina) [Larval digeneans of *Heleobia*

https://doi.org/10.1017/S0022149X2100081X Published online by Cambridge University Press

parchappii and *Heleobia australis* in freshwater and estuarine environments of Buenos Aires province (Argentina)]. *Revista Argentina de Parasitología* **2** (2), 14–21. [In Spanish.]

Merlo MJ, Parietti M and Etchegoin JA (2017) Stunting of the penis in *Heleobia parchappii* (Mollusca: Cochliopidae) and its relationship with parasitism. *Diseases of Aquatic Organisms* **123**(1), 81–85.

Merlo MJ, Parietti M and Etchegoin JA (2019) Temporal variations of larval digenean assemblages parasitizing *Heleobia parchappii* (Mollusca: Cochliopidae) in two shallow lakes from the Buenos Aires province, Argentina. *Iheringia Série Zoologia* **109**, e2019025.

Mesquita SG, dos Santos Neves FG, Scholte RGC, dos Santos Carvalho O, Fonseca CT and Caldeira RL (2021) Optimization of a loop-mediated isothermal amplification (LAMP) assay for *Schistosoma mansoni* (Trematoda: Digenea) detection in *Biomphalaria* spp. from endemic areas for schistosomiasis in Brazil. *Parasites & Vectors*, 1–23. doi: 10.21203/rs.3.rs-419640/v1.

Mignaqui AC, Alvarez LP, Soler P and Larroza MP (2020) Development of a duplex PCR for the identification of *Fasciola hepatica* in lymnaeid snails. *Revista de Investigaciones Agropecuarias* **46**(3), 347–351.

Mollusca Base (eds.) (2021) MolluscaBase. Available at http://www.molluscabase.org (accessed 6 August 2021).

Morris MR (1976) Contribución al conocimiento del parasitismo de *Biomphalaria peregrina* (D'Orbigny) (Mollusca, Gastropoda) [Contribution to the knowledge of the parasitism of *Biomhalaria peregrina* (D'Orbigny) (Mollusca, Gastropoda)]. *Neotrópica* **22(1)**, 93–98. [In Spanish.]

Morris MR (1978) Estados larvales de trematodes digeneos en moluscos dulceacuícolas [Larval stages of digenean trematodes in freshwater molluscs]. *Neotrópica* **24**(71), 69–72. [In Spanish.]

Muñoz G and Olmos V (2008) Revisión bibliográfica de especies endoparásitas y hospedadoras de sistemas acuáticos de Chile [Bibliographic review of endoparasitic and host species of aquatic systems of Chile]. *Revista de Biología Marina y Oceanografía* **43**(2), 173–245. [In Spanish.]

Ostrowski de Núñez M (1972) Fauna de agua dulce de la República Argentina. I. Anotaciones sobre furcocercarias [Freshwater fauna of the Argentine Republic. I. annotations on furcocerriae]. *Neotrópica* **18**, 137–140. [In Spanish.]

Ostrowski de Núñez M (1973) Sobre el ciclo biológico de *Posthodiplostomum nanum* Dubois, 1937 (Trematoda, Diplostomatidae) [On the biological cycle of *Posthodiplostomum nanum* Dubois, 1937 (Trematoda, Diplostomatidae)]. *Physis* **32**, 121–132. [In Spanish.]

Ostrowski de Núñez M (1974a) Fauna de agua dulce de la República Argentina. II. Cercaria perteneciente a la superfamilia Opisthorchioidea y parte de su ciclo evolutivo (Trematoda) [Freshwater fauna of the Argentine Republic. II. Cercaria belonging to the Opisthorchioidea superfamily and part of its evolutionary cycle (Trematoda)]. *Physis Sección B* **33**, 1–9. [In Spanish.]

Ostrowski de Núñez M (1974b) Sobre el ciclo biológico de *Episthmium suspensum* (Braun, 1901) Travassos, 1922 [On the biological cycle of *Episthmium suspensum* (Braun, 1901) Travassos, 1922]. *Revista del Museo Argentino de Ciencias Naturales Bernardino Rivadavia* **1(1)**, 153–164. [In Spanish.]

Ostrowski de Núñez M (1974c) Fauna de agua dulce de la República Argentina. III. Cercarias de la superfamilia Plagiorchioidea (Trematoda) [Freshwater fauna of the Argentine Republic. III. Cercariae of the superfamily Plagiorchioidea (Trematoda)]. *Neotrópica* **20(1)**, 1–8. [In Spanish.]

Ostrowski de Núñez M (1974d) Estudio sobre estadíos larvales de trematodes Digeneos de peces Cyprinodontiformes. *Physis* **33**, 45–61.

Ostrowski de Núñez M (1975a) Fauna de agua dulce de la República Argentina. IV. Cercarias (Trematoda) de *Littoridina piscium* [Freshwater fauna of the Argentine Republic. IV. Cercariae (Trematoda) of *Littoridina piscium*]. *Physis Seccion B* **34**, 63–68. [In Spanish.]

Ostrowski de Núñez M (1975b) Fauna de agua dulce de la República Argentina. IV. una cercaria de la familia Haploporidae (Trematoda) [Freshwater fauna of the Argentine Republic. IV. a cercariae of the family Haploporidae (Trematoda)]. *Neotrópica* **21**, 61–64. [In Spanish.]

Ostrowski de Núñez M (1976a) Fauna de agua dulce de la República Argentina. VI. las cercarias de *Ascocotyle tenuicollis* Price, 1935 y de *Pygidiopsis pindoramensis* Travassos, 1929 (Trematoda, Heterophyidae) [Fresh water fauna of the Argentine Republic. VI. the cercariae of *Ascocotyle tenuicollis* Price, 1935 and *Pygidiopsis pindoramensis* Travassos, 1929 (Trematoda, Heterophyidae). *Physis Seccion B* **34**, 51–57. [In Spanish.]

Ostrowski de Núñez M (1976b) Sobre el ciclo biológico de *Hippocrepis fuelleborni* Travassos y Vogelsang 1930 (Trematoda, Notocotylidae) [On the biological cycle of *Hippocrepis fuelleborni* Travassos and Vogelsang 1930 (Trematoda, Notocotylidae)]. *Physis Seccion B* **35**, 125–130. [In Spanish.]

Ostrowski de Núñez M (1977a) Fauna de agua dulce de la República Argentina. VIII. Furcocercarias (Trematoda) nuevas de moluscos de las familias Planorbidae y Ancylidae [Freshwater fauna of the Argentine Republic. VII. Furcocercariae (Trematoda) new from molluscs of the families Planorbidae and Ancylidae]. *Physis Seccion B* **37**(1), 117–125. [In Spanish.]

Ostrowski de Núñez M (1977b) Fauna de agua dulce de la República Argentina. VII. Cercarias de la familia Schistosomatidae (Trematoda, Digenea) [Freshwater fauna of the Argentine Republic. VII. Cercariae of the family Schistosomatidae (TTrematoda, Digenea)]. *Comunicaciones del Museo Argentino de Ciencias Naturales Bernardino Rivadavia* **2**(3), 65–75. [In Spanish.]

Ostrowski de Núñez M (1979a) Ungewöhnliche Xiphidiocercarie aus *Ampullaria canaliculata* nebst bemerkungen über *Travtrema stenocotyle* [Unusual Xiphidiocercaria from *Ampullaria canaliculata* together with remarks on *Travtrema stenocotyle*]. *Angewandte Parasitologie* **20**, 46–52. [In German.]

Ostrowski de Núñez M (1979b) Fauna de agua dulce de la República Argentina IX. sobre representantes de la familia Paramphistomatidae (Trematoda) [Freshwater fauna of the Argentine Republic IX. about representatives of the family Paramphistomatidae (Trematoda)]. *Physis Seccion B* **38**(95), 55–62. [In Spanish.]

Ostrowski de Núñez M (1981) Fauna de agua dulce de la República Argentina. X. Cercarias de las superfamilias Echinostomatoidea, Allocreadioidea y Microphaloidea (Trematoda, Digenea) [Fresh water fauna of the Argentine Republic. X. Cercariae of the superfamilies Echinostomatoidea, Allocreadioidea, and Microphaloidea (Trematoda, Digenea). *Comunicaciones del Museo Argentino de Ciencias Naturales Bernardino Rivadavia* **2**(1), 1–9. [In Spanish.]

Ostrowski de Núñez M (1987) The life history of *Acanthostomum brauni* Mañe Garzon & Gil, 1961 (Trematoda, Acanthostomatidae). *Zoologischer Anzeiger* **218**(5–6), 273–286.

Ostrowski de Núñez M (1989) The life history of a trematode, *Apharyngostrigea simplex* (Johnston 1904), from the ardeid bird *Egretta thula* in Argentina. *Zoologischer Anzeiger* **222**(5–6), 322–336.

Ostrowski de Núñez M (1992) Life history studies of heterophyid trematodes in the Neotropical region: *Ascocotyle* (*Leighia*) *hadra* sp. n. *Memorias do Instituto Oswaldo Cruz* **87**(4), 539–543.

Ostrowski de Núñez M (1993) Life-history studies of heterophyid trematodes in the Neotropical Region: Ascocotyle (Phagicola) diminuta (Stunkard & Haviland, 1924) and A.(P.) angrense Travassos, 1916. *Systematic Parasitology* **24**(3), 191–199.

Ostrowski de Núñez M (1994) Profile: Lothar Szidat (1892–1973). *Systematic Parasitology* **27(1)**, 77–78.

Ostrowski de Núñez M (1995) Life history of *Pygidiopsis crassus* n. sp. (Trematoda, Digenea, Heterophyidae) in the neotropical region. *Memórias do Instituto Oswaldo Cruz* **90**(1), 13–19.

Ostrowski de Núñez M (1996) Life history studies of heterophyid trematodes in the Neotropical region: *Pygidiopsis australis* sp. n., a sibling species of *P. pindoramensis* Travassos, 1929. *Acta Parasitologica* **41**(1), 13–19.

Ostrowski de Núñez M (1998) Life cycle of *Ascocotyle* (*Phagicola*) *angeloi* (Digenea: Heterophyidae) in the Neotropical region. *Folia Parasitologica* **45**(3), 199–204.

Ostrowski de Núñez M (2001) Life cycles of two new sibling species of *Ascocotyle* (Ascocotyle) (Digenea, Heterophyidae) in the Neotropical region. *Acta Parasitologica* **46**(2), 119–129.

Ostrowski de Núñez M (2007) Life cycle of *Stephanoprora uruguayense* (Digenea: Echinostomatidae) in Argentina. *Journal of Parasitology* **93**(5), 1090–1096.

Ostrowski de Núñez M and Gil de Pertierra A (1991) The life history of *Acanthostomum gnerii* Szidat, 1954 (Trematoda: Acanthostomatidae),

https://doi.org/10.1017/S0022149X2100081X Published online by Cambridge University Press

from the catfish *Rhamdia sapo* in Argentina. *Zoologischer Anzeiger* **227**(1–2), 58–71.

Ostrowski de Núñez M and Quaggiotto EA (1995) Trematodes larvales (Digenea) de las familias Diplostomidae, Strigeidae y Echinostomatidae en la región Patagónica Argentina [Larval trematodes (Digenea) of the families Diplostomidae, Strigeidae and Echinostomatidae in the Patagonian region of Argentina]. *Boletín Chileno de Parasitología* **50(1–2)**, 28–33. [In Spanish.]

Ostrowski de Núñez M and Quintana MG (2008) The life cycle of *Stephanoprora aylacostoma* n. sp. (Digenea: Echinostomatidae), parasite of the threatened snail *Aylacostoma chloroticum* (Prosobranchia, Thiaridae), in Argentina. *Parasitology Research* **102**(4), 647–655.

Ostrowski de Núñez M, Hamann MI and Rumi A (1990) Larval trematodes of *Schistosoma mansoni* transmitting snails, *Biomphalaria* spp., in northeastern Argentina. *Acta Parasitologica Polonica* **35**(2), 85–96.

Ostrowski de Núñez M, Hamann MI and Rumi A (1991) Population dynamics of planorbid snails from a lenitic biotope in northeastern Argentina. Larval trematodes of *Biomphalaria occidentalis* and analysis of their prevalence and seasonality. *Acta Parasitologica Polonica* **36**(4), 159–166.

Ostrowski de Núñez M, Hamann MI and Rumi A (1991) Population dynamics of planorbid snails from a lenitic biotope in northeastern Argentina. Larval trematodes of *Biomphalaria occidentalis* and analysis of their prevalence and seasonality. *Acta Parasitologica Polonica* **36**(4), 159–166.

Ostrowski de Núñez M, Hamann MI and Rumi A (1997) Estudios de trematodes larvales en *Biomphalaria* spp. (Mollusca, Planorbidae) de la localidad de San Roque, provincia de Corrientes, Argentina [Studies of larval trematodes in *Biomphalaria* spp. (Mollusca, Planorbidae) from the locality of San Roque, province of Corrientes, Argentina]. *Physis* **54**(126–127), 7–15. [In Spanish.

Ostrowski de Núñez M, Semenas L, Brugni N, Viozzi G and Flores VR (1999) Redescription of *Acanthostomoides apophalliformis* (Trematoda, Acanthostomidae) from *Percichthys trucha*. *Acta Parasitologica* **44**(4), 222–228.

Ostrowski de Núñez M, Spatz L and González Cappa SM (2003) New intermediate hosts in the life cycle of *Zygocotyle lunata* in South America. *Journal of Parasitology* **89**(1), 193–194.

Ostrowski de Núñez M, Davies D and Spatz L (2011) The life cycle of *Zygocotyle lunata* (Trematoda, Paramphistomoidea) in the subtropical region of South America. *Revista Mexicana de Biodiversidad* **82**(2), 581–588.

Ostrowski de Núñez M, Quintana MG and Laczkó ACM (2020) The life cycle of *Heterophyes yacyretana* n. sp. (Digenea, Heterophyidae), parasitic in the endemic snail *Aylacostoma chloroticum* (Caenogastropoda, Thiaridae) in Argentina. *Journal of Parasitology* **106**(5), 625–632.

Pantoja C, Faltýnková A, O'Dwyer K, Jouet D, Skírnisson K and Kudlai O (2021) Diversity of echinostomes (Digenea: Echinostomatidae) in their snail hosts at high latitudes. *Parasite* **28**, 59.

Parietti M (2018) *Ecología de las comunidades de digeneos larvales en hospedadores moluscos que habitan ambientes dulceacuícolas de la Provincia de Buenos Aires, Argentina* [Ecology of larval digenean communities in mollusc hosts that inhabit freshwater environments of Buenos Aires Province, Argentina]. Phd thesis, Universidad Nacional de Mar del Plata, Argentina. [In Spanish.]

Parietti M, Merlo MJ and Etchegoin JA (2013) Can the studies at a spatial scale of 100s meters detect the spatiotemporal fluctuations of a parasite assemblage? *Acta Parasitologica* **58**(4), 577–584.

Parietti M, Merlo MJ and Etchegoin JA (2015) Estadios larvales de digeneos (Trematoda) que parasitan a *Biomphalaria peregrina*, D'Orbigny, 1835 (Mollusca, Planorbidae) en el sudeste de la provincia de Buenos Aires (Argentina) [Larval stages of digeneans (Trematoda) that parasitize *Biomhalaria peregrina*, D'Orbigny, 1835 (Mollusca, Planorbidae) in the southeast of Buenos Aires province (Argentina)]. *Revista Argentina de Parasitología* **3**(3), 10–17. [In Spanish.]

Parietti M, Merlo MJ and Etchegoin JA (2020) Spatio-temporal variations in larval digenean assemblages of *Heleobia parchappii* (Mollusca: Cochliopidae) inhabiting four human-impacted streams. *Journal of Helminthology* **94**, E137.

Parietti M, Merlo MJ and Etchegoin JA (2021) Effects of droughts on the larval digenean assemblage that parasitizes the snail *Biomphalaria peregrina* (Planorbidae): a 4-year study in a temporary pond from Argentina. *Parasitology Research* **120**(5), 1909–1914.

Pereira EM, Müller G, Secchi E, Pereira Jr J and Valente ALS (2013) Digenetic trematodes in South American sea lions from southern Brazilian waters. *The Journal of Parasitology* **99**(5), 910–913.

Pinto HA and De Melo AL (2013) A checklist of cercariae (Trematoda: Digenea) in molluscs from Brazil. *Zootaxa* **3666**(4), 449–475.

Prepelitchi L (2002) *Ciclo evolutivo parcial de dos especies de Echinostomatidae (Trematoda: Digenea) halladas en* Lymnaea viatrix *de Cholila, Chubut* [Partial evolutionary cycle of two species of Echinostomatidae (Trematoda: Digenea) found in *Lymnaea viatrix* from Cholila, Chubut.] Grade thesis, Universidad Nacional de Buenos Aires, Argentina. [In Spanish.]

Prepelitchi L and Ostrowski de Núñez M (2007) Echinostomatid larval stages in *Lymnaea viatrix* (Gastropoda: Pulmonata) from southwest Patagonia, Argentina. *Journal of Parasitology* **93**(2), 323–327.

Quaggiotto EA and Valverde F (1995) Estadios larvales de trematodes digeneos en *Chilina* sp. (Mollusca, Pulmonata) de algunos cuerpos de agua de Patagonia, Argentina [Larval stages of digenean trematodes in *Chilina* sp. (Mollusca, Pulmonata) from some water bodies of Patagonia, Argentina]. *Boletín Chileno de Parasitología* **50(1–2)**, 33–36. [In Spanish.]

Quintana MG and Ostrowski de Núñez M (2014) The life cycle of *Pseudosellacotyla lutzi* (Digenea: Cryptogonimidae), in *Aylacostoma chloroticum* (Prosobranchia: Thiaridae), and *Hoplias malabaricus* (Characiformes: Erythrinidae), in Argentina. *Journal of Parasitology* **100**(6), 805–811.

Quintana MG and Ostrowski de Núñez M (2016) The life cycle of *Neocladocystis intestinalis* (Vaz, 1932) (Digenea: Cryptogonimidae), in *Aylacostoma chloroticum* (Prosobranchia: Thiaridae), and *Salminus brasiliensis* (Characiformes: Characidae), in Argentina. *Parasitology Research* **115**(7), 2589–2595.

Ritossa L, Flores VR and Viozzi GP (2013) Life-cycle stages of a *Posthodiplostomum* species (Digenea: Diplostomidae) from Patagonia, Argentina. *Journal of Parasitology* **99**(5), 777–780.

Ritossa L, Flores VR and Viozzi GP (2014) Infection dynamics of *Posthodiplostomum* sp. (Digenea: Diplostomidae) in first and second intermediate hosts from an Andean Patagonian lake (Argentina). *Revista Argentina de Parasitología* **3**(1), 16–23.

Rubel D, Prepelitchi L, Kleiman F, Carnevale S and Wisnivesky-Colli C (2005) Estudio del foco en un caso de fasciolosis humana en Neuquén [Study of the focus in a case of human fasciolosis in Neuquén]. *Medicina (Buenos Aires)* **65**(3), 207–212. [In Spanish.]

Rumi A, Gutiérrez Gregoric DE, Núñez V, César II, Roche MA, Tassara MP, Martin S and Armengol MFL (2006) Freshwater Gastropoda from Argentina: species richness, distribution patterns, and an evaluation of endangered species. *Malacologia* **49**(1), 189–208.

Rumi A, Gutiérrez Gregoric DE, Núñez V and Darrigran DA (2008) Malacología Latinoamericana. Moluscos de agua dulce de Argentina [Latin American malacology. Freshwater molluscs from Argentina]. *Revista Biologica Tropica* **56**(1), 77–111. [In Spanish.]

Sanero E, Hechem V, Saunders DN, Boquet M, Assef YA, Pardo CA, Villegas V and Sanchez Thevenet P (2018) Insights on the presence and economic impact of water related trematodes in natural environments from Patagonia, southern Argentina. *Journal Water Technology and Treatment Methods* **1**(4), 1–6.

Schwantes JB, Quevedo P, D'Ávila MF, Molento MB and Graichen DAS (2020) *Fasciola hepatica* in Brazil: genetic diversity provides insights into its origin and geographic dispersion. *Journal of Helminthology* **94**, e83, 1–7.

Semenas L, Brugni N and Ostrowski de Núñez M (1999) Metacercariae of Echinostomatidae in *Diplodon chilensis* (Unionacea, Pelecypoda) and description of *Echinoparyphium megacirrus* sp. n. in Patagonia (Argentina). *Acta Parasitologica* **44**(1), 63–67.

Silva AEP, Freitas CDC, Dutra LV and Molento MB (2020) Correlation between climate data and land altitude for *Fasciola hepatica* infection in cattle in Santa Catarina, Brazil. *Revista Brasileira de Parasitologia Veterinária* **29**(3), e008520.

Soler P (2018) *Diagnóstico de infestación por* Fasciola hepática *(Trematoda) en caracoles lymnaeidos mediante técnicas moleculares* [Diagnosis of *Fasciola hepatica* (Trematoda) infestation in lymnaeid snails by molecular techniques]. Grade thesis, Universidad Nacional del Comahue, Argentina. [In Spanish.]

https://doi.org/10.1017/S0022149X2100081X Published online by Cambridge University Press

Szidat L (1951) Cercarias schistosómicas y dermatitis schistosómica humana en la República Argentina [Schistosomal cercariae and human schistosomal dermatitis in the Argentine Republic]. *Comunicación del Instituto Nacional de Investigaciones en Ciencias Naturales, Buenos Aires, Zoología* **210**, 129–150. {In Spanish.]

Szidat L (1954) Trematodes nuevos de especies de agua dulce de la República Argentina y un intento para aclarar su carácter marino [New trematodes of freshwater species from the Argentine Republic and an attempt to clarify their marine character]. *Revista del Instituto Nacional de Investigaciones en Ciencias Naturales Y Zoologicas* **3**(1), 1–85. [In Spanish.]

Szidat L (1956) Uber den entwicklungszyklus mit progenetischen larvenstadien (Cercariaeen) von *Genarchella genearchella* Travassos, 1928 (Trematoda, Hemiuridae) und die moglichkeit einer hormonalen beeinflussung der parasiten durch ihre wirtstiere [On the development cycle with progenetic larval stages (Cercariaeen) of *Genarchella genearchella* Travassos, 1928 (Trematoda, Hemiuridae) and the possibility of a hormonal influencing of the parasites by their host animals]. *Zeitschrift fur Tropenmedizin und Parasitologie* **7(1)**, 132–153. [In German.]

Szidat L (1957) Über den entwicklungszyklus von *Psilochasmus oxyurus* (Creplin 1825, Lühe 1910) (Trematoda, Psilostomidae) in Argentinien [On the development cycle of *Psilochasmus oxyurus* (Creplin 1825, Lühe 1910) (Trematoda, Psilostomidae) in Argentina]. *Zeitschrift für Parasitenkunde* **18**(1), 24–35. [In German.]

Szidat L (1958) Investigaciones sobre *Cercaria chascomusi* n. sp. agente causal de una nueva enfermedad humana en la Argentina: La dermatitis de los bañistas de la laguna Chascomús [Research on *Cercaria chascomusi* n. sp. causal agent of a new human disease in Argentina: dermatitis of the bathers of the Chascomús lagoon]. *Boletín del Museo Argentino de Ciencias Naturales Bernardino Rivadavia* **18(1)**, 1–16. [In Spanish.]

Szidat L (1963) Sobre Ciclocoelidae (Trematoda, Digenea) sudamericanas con una contribución sobre su ecología [On South American Cyclocoelidae (Trematoda, Digenea) with a contribution on their ecology.] *Revista Museo Argentino de Ciencias Naturales Bernardino Rivadavia* **9(1)**, 27–36. [In Spanish.]

Szidat L (1964) *Cercaria macronucleata* sp. nov. (Trematoda) de la almeja del Río de la Plata *Diplodon variabilis* [*Cercaria macronucleata* sp. nov. (Trematoda) of the Rio de la Plata clam *Diplodon variabilis*]. *Neotrópica* **10**(31), 49–53. [In Spanish.]

Szidat L (1970) *Saccocoelioides octavus* n. sp., a new species of the genus *Saccocoelioides* Szidat, 1954 (Trematoda, Haploporinae Looss 1902). *Revista Museo Argentino de Ciencias Naturales Bernardino Rivadavia* **10** (5), 87–100.

Szidat L and Szidat U (1960) Eine neue, dermatitis erzeugende cercarie der trematoden-familie Schistosomidae aus *Tropicorbis peregrinus* (D'Orbigny) des Rio Quequén [A new dermatitis-causing cercaria of the trematode family Schistosomidae from *Tropicorbis peregrinus* (D'Orbigny) of the Rio Quequén]. *Zeitschrift für Parasitenkunde* **20**, 359–367. [In German.]

Szidat L and Szidat U (1961) Die trematoden der gattung *Notocotylus* Diesing 1839 (Notocotylidae Lühe 1909) aus Südamerika bzw. Argentinien und daten ihrer entwicklungsgeschichte [The trematodes of the genus *Notocotylus* Diesing 1839 (Notocotylidae Lühe 1909) from South America and Argentina and dates of their development history]. *Zeitschrift für Parasitenkunde* **21**(2), 169–180. [In German.]

Tsuchida K, Urabe M, Viozzi G, Rauque C and Flores VR (2021) A new species of hemiuroidean trematode from *Hatcheria macraei* (Siluriformes, Trichomycteridae) and *Heleobia hatcheri* (Gastropoda, Gochliopidae) in a Patagonian river. *Parasitology Research* **120**, 2523–2532.

Veleizán AA (2009) *Efecto de la heterogeneidad ambiental sobre la comunidad de digeneos larvales de* Chilina *spp. (Gastropoda) en lagos de la Patagonia Argentina* [Effect of environmental heterogeneity on the larval digenean community of *Chilina* spp. (Gastropoda) in lakes of Patagonia Argentina]. Grade thesis, Universidad Nacional del Comahue, Argentina. [In Spanish.]

Veleizán AA, Flores VR and Viozzi GP (2016) Dermatitis cercarial en bañistas del norte de la Patagonia Argentina [Cercarial dermatitis in bathers from northern Patagonia Argentina]. *Medicina (Argentina)* **76**(1), 25–29. [In Spanish.]

Wernicke R (1888) Informe sobre los trabajos llevados a cabo en el laboratorio para el estudio de las enfermedades contagiosas [Report on the work carried out in the laboratory for the study of contagious diseases]. *Biblioteca de la Facultad de Medicina, Buenos Aires* **1**, 16599. [In Spanish.]

Wernicke R (1892) Trematodes. *Anales del Círculo Médico Argentino* **15**(6), 337–347.

World Register of Marine Species (2021). Available at https://www.marinespecies.org/ (accessed 6 August 2021).

https://doi.org/10.1017/S0022149X2100081X Published online by Cambridge University Press