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The Journal of Parasitology, Vol. 80, No. 6. (Dec., 1994), pp. 1013-1017.

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ON *GENARCHELLA ISABELLAE* (DIGENEA: DEROGENIDAE) FROM CICHLID AND PIMELODID FISHES IN MEXICO

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ABSTRACT: Evaluation of comparative material, including type specimens, of 2 derogenid species (Digenea: Derogenidae) in freshwater fishes of the families Cichlidae and Pimelodidae in Mexico revealed the invalidity of *Genarchella luistoddi* (Jiménez, Guajardo, and Briseño, 1981), a parasite of cichlid fishes in northern Mexico. This taxon is considered to be conspecific with *Genarchella isabellae* (Lamothe-Argumedo, 1977), originally described from the pimelodid *Rhamdia guatemalensis* (Günther) and frequently occurring in cichlids of the genus *Cichlasoma* in southeastern Mexico.

Hamann (1986) and later Lunaschi (1990) and Kohn et al. (1990) resurrected the derogenid genus *Genarchella* Travassos, Artigas, and Pereira, 1928. Kohn et al. (1990) synonymized *Caballeroiella* Lamothe-Argumedo, 1977 and *Quadripaludis* Jimenez, Guajardo, and Briseño, 1981 with *Genarchella* (Kohn et al., 1990). However, the validity of 2 species previously referred to these genera, i.e., *Genarchella isabellae* (Lamothe-Argumedo, 1977) and *Genarchella luistoddi* (Jiménez, Guajardo, and Briseño, 1981), parasitizing cichlid and pimelodid fishes in Mexico, was not discussed by these authors. Because the morphology of both the species as given in their original descriptions (Lamothe-Argumedo, 1977; Jiménez et al., 1981) shows their close similarity, the aim of the present study was to ascertain the validity of the 2 taxa.

MATERIALS AND METHODS

During this study, the following type and voucher specimens were evaluated.

Genarchella isabellae (Lamothe-Argumedo) (originally referred to *Caballeroiella*), holotype and paratype from the stomach of *Rhamdia guatemalensis* (Günther), Lago de Catemaco, Veracruz, Mexico, September 1973 (Lamothe-Argumedo, 1977) (Instituto de Biología, Universidad Nacional Autónoma de México [UNAM], Mexico City, cat. no. 227-17); 17 specimens found in the stomach of *Cichlasoma urophthalmus* (Günther), El Corozal, Tabasco, Mexico, June 1987; 1 specimen from the stomach of *C. urophthalmus*, the Champoton River, Campeche, Mexico, January 1988 (all in the Helminthological Collection of the Laboratory of Parasitology, CINVESTAV-IPN Merida).

Genarchella luistoddi (Jiménez, Guajardo, and Briseño) (originally referred to *Quadripaludis*), holotype, 11 paratypes, and 7 voucher specimens from the stomach and intestine of *Cichlasoma* spp., Cuatro Ciénegas, Coahuila, Mexico, May, August, September, October, and November 1973, February 1974 (Jiménez et al., 1981) (Helminthological Collection of the Laboratory of Parasitology, University of Nuevo Leon [UNL], Monterrey, Mexico).

The specimens from El Corozal and Champoton River were fixed with Bouin's solution under a slight coverslip pressure for 24 hr. Thereafter, they were stained with paracarmine, dehydrated in an alcohol series, and mounted as permanent preparations.

Terminology used in the present paper follows that of Gibson and Bray (1979). Line drawings were made with the aid of an Olympus drawing attachment; all measurements in descriptions and Table I are in micrometers (μm).

RESULTS

Comparison of types and voucher specimens of *G. isabellae* and *G. luistoddi* revealed their close similarity in almost all morphological and biometrical features (Figs. 1–7; Table I), including the morphology of the terminal genitalia (Figs. 5, 6). These are typified by the presence of a well-developed, strongly muscular sinus organ in all specimens studied. Pars prostatica is relatively short, being formed by prostatic cells located freely in the parenchyma and surrounding proximal part of the sinus organ. Prostatic vesicle is oval, situated closely posterior to the sinus organ (Figs. 5, 6).

Slight differences were observed only in the shape and size of the body (compare Figs. 1, 2 with 3, 4, and 7), the position of the ventral sucker (Figs. 1, 3 and 2, 4, 7) and in the distribution of eggs between some specimens (Figs. 1, 2 and 3, 4, 7). However, these differences were found even in specimens from the same host and locality (Figs. 2, 3).

On the basis of these observations, *G. isabellae* and *G. luistoddi* are considered to be conspecific,

Received 8 February 1994; revised 23 June 1994; accepted 23 June 1994.

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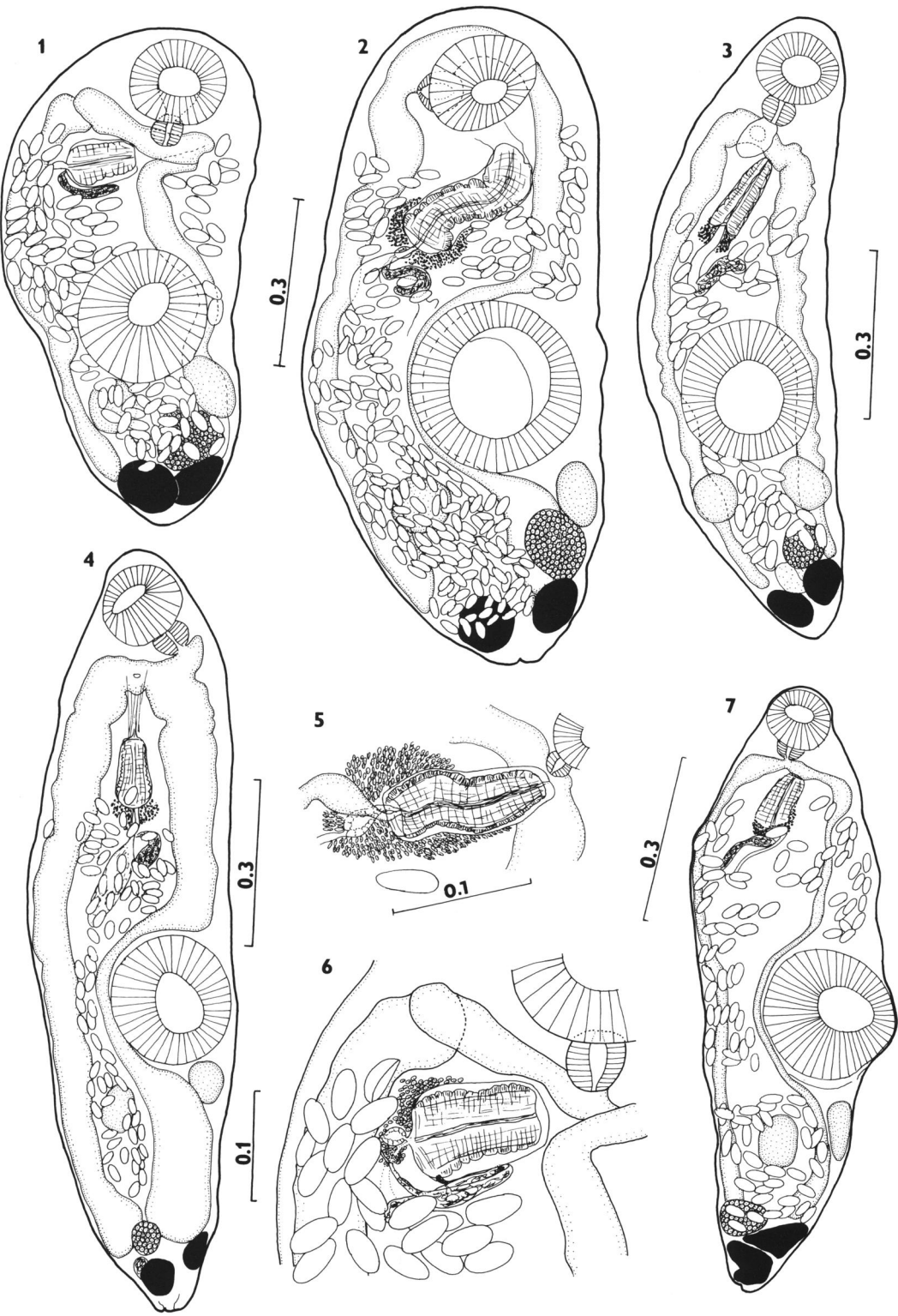


TABLE I. Measurements (in μm) and host/locality information for derogenids parasitizing cichlid and pimelodid fishes in Mexico.

	No. of worms			
	<i>Genarchella isabellae</i>			<i>G. luistoddi</i>
	2	11	1	16
Host	<i>Rhamdia guatemalensis</i>	<i>Cichlasoma urophthalmus</i>	<i>C. urophthalmus</i>	<i>Cichlasoma</i> spp.
Locality	Catemaco	El Corozal	Champoton	Cuatro Ciénegas
Authors	Lamothe-Argumedo, 1977	Present authors	Present authors	Jiménez et al. 1981
Body length	756–917	930–1,630	1,330	745–1,491
Body width	402–418	293–520	350	245–409
Oral sucker				
Length	131–142	97–184	127	81–133
Width	161–168	142–206	143	98–154
Ventral sucker				
Length	225	207–310	231	175–280
Width	221–225	157–302	207	165–284
Sucker ratio				
Length	1:1.5–1.7	1:1.7–2.3	1:1.8	—
Width	1:1.3–1.4	1:1.2–2.1	1:1.4	—
Pharynx	45 × 45–48	49–73 × 57–81	57 × 67	35–60 × 46–77
Testes				
Length	75–112	66–117	73–75	70–140
Width	75–82	61–105	61–68	46–95
Sinus organ				
Length	112–127	174–374	121	61–148
Width	60–71	50–97	63	23–58
Ovary				
Length	82–93	77–121	75	32–116
Width	82–93	63–111	54	32–116
Vitellaria				
Length	—	65–111	69–72	56–179
Width	—	48–105	30–58	25–84
Eggs				
Length	41–45	38–46	36–47	32–56
Width	18–22	18–22	16–18	23–30

and the name *Genarchella isabellae* is proposed for the species.

DISCUSSION

The genera *Caballeroiella* and *Quadripaludis*, both monotypic, were synonymized with *Genarchella* by Kohn et al. (1990) on the basis of the presence of a distinct permanent sinus organ.

The present study revealed the conspecificity of both species of the former genera, i.e., *G. isabellae* and *G. luistoddi*, because no morphological and biometrical differences were found between these taxa.

Jiménez et al. (1981), who described derogenids found in cichlids of the genus *Cichlasoma* from northern Mexico as a new species, *G. luis-*

FIGURES 1–7. *Genarchella isabellae*. 1. *Caballeroiella isabellae* from *Rhamdia guatemalensis*, Lago de Catemaco, Veracruz, Mexico, paratype. 2. *C. isabellae* from *Cichlasoma urophthalmus*, El Corozal, Tabasco, Mexico. 3. *C. isabellae* from *C. urophthalmus*, El Corozal, Tabasco, Mexico. 4. *C. isabellae* from *Cichlasoma urophthalmus*, Champoton River, Campeche, Mexico. 5. Terminal genitalia of *Quadripaludis luistoddi* from *Cichlasoma* sp., Cuatro Ciénegas, Coahuila, Mexico. 6. Terminal genitalia of *C. isabellae* from *R. guatemalensis*, Lago de Catemaco, Veracruz, Mexico, paratype. 7. *Q. luistoddi* from *Cichlasoma* sp., Cuatro Ciénegas, Coahuila, Mexico, paratype no. 10. Scale bars in millimeters (mm).

toddi, distinguished their new taxon from *G. isabellae* only by the shape of the uterus (extracecal and anterior to the cecal bifurcation in *G. isabellae*, whereas it is intracecal and posterior to the intestinal bifurcation in *G. quadripaludis*). As is evident from the present study, this feature is highly variable in both taxa. The uteri of some *G. isabellae* specimens were clearly intercecal (Figs. 3, 4), whereas the examination of voucher specimens of *G. luistoddi*, including some paratypes, e.g., paratype no. 10, Figure 7, showed that several specimens possessed distinctly extracecal uteri. Taking into account priority, the name *G. isabellae* is recognized as valid.

Genarchella isabellae differs from other congeners parasitizing freshwater fishes in the region (see Manter, 1936; Watson, 1976), namely *G. tropica* (Manter, 1936) (originally referred to *Drogenes* Lühe, 1900), *G. astyanactis* (Watson, 1976), and *G. thorsoni* (Watson, 1976) (both species originally placed in *Paravitellotrema* Watson, 1976) by the presence of a very large, strongly muscular sinus organ (Figs. 2, 3, 6). *Genarchella astyanactis*, which was found in the characid *Astyanax fasciatus* (Cuvier) in Nicaragua, and *G. tropica*, a parasite of *R. guatemalensis* from cenotes in the Yucatan Peninsula, Mexico, possess a small, cone-shaped, slightly muscular sinus organ (Manter, 1936; Watson, 1976). *Genarchella thorsoni* (Watson, 1976), originally described from *Rhamdia managuensis* (Günther) from Nicaragua (Watson, 1976) and typified by the presence of a rather large sinus organ, somewhat similar to that in *G. isabellae*, can be distinguished mainly by different structure of pars prostatica. This is formed in *G. thorsoni* by numerous prostatic cells surrounding an almost tubular, rather long prostatic vesicle so that the seminal vesicle is situated a long distance from the sinus organ (Watson, 1976).

Although *G. isabellae* was originally described from the pimelodid *R. guatemalensis*, published data indicate that this derogenid species parasitizes mainly cichlids of the genus *Cichlasoma*. It has hitherto been recorded in fishes from a few, rather isolated localities in northern (state of Coahuila) and southeastern Mexico (states of Veracruz, Tabasco, Campeche, and Yucatan) (Lamothe-Argumedo, 1977; Jiménez et al., 1981; Guajardo-Martínez, 1984). Nevertheless, actual distribution of this parasite might include other geographical regions where cichlid fishes of the genus *Cichlasoma* occur, including those in Central America.

ACKNOWLEDGMENTS

The authors express their gratitude to Dr. Lamothe-Argumedo, Institute of Biology, Universidad Nacional Autónoma de México, Mexico City for the kind loan of types of *G. isabellae*, and to Dr. F. Jiménez-Guzmán and Mr. F. Segovia-Salinas, both Facultad de Ciencias Biológicas, Universidad de Nuevo León, Monterrey, Mexico, for allowing us to examine the types and reference specimens of *G. luistoddi*.

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