

Koleopterologische Rundschau	73	1 – 6	Wien, Juni 2003
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# First record of Sphaeriusidae for Argentina (Coleoptera: Myxophaga)

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## Abstract

The genus *Sphaerius* WALTZ (Coleoptera: Sphaeriusidae) is recorded for the first time for Argentina and for the southern part of South America. It is likely that the two available specimens belong to a new species.

**Key words:** Coleoptera, Sphaeriusidae, *Sphaerius*, new record, Argentina, Provincia de Córdoba.

## Introduction

Due to the cryptic habits, the very small size, and the structural uniformity, the family Sphaeriusidae has attracted little attention among coleopterists. The identification of species is difficult and the beetles may be easily overlooked in larger samples. It is quite plausible to assume that the range of the group is larger than previously expected, as most collectors do not apply techniques necessary to collect *Sphaerius* WALTZ, or may not be interested in beetles of this size. Therefore, it is not surprising, that a new record of the family for the African continent was published only few years ago (ENDRÖDY-YOUNGA 1997). South America is not listed as part of the distributional area of the family in some of the more recent publications (e.g. BRITTON 1966, LAWRENCE & REICHARDT 1991), but there are records for *Sphaerius tropicus* MATTHEWS from the north-western part of the Neotropical Region (Ecuador) (REICHARDT 1975). Besides that, specimens from Venezuela, Ecuador and Peru are deposited in the collection of the National Museum of Natural History, Smithsonian Institution (Washington DC). Nevertheless, the new record from Argentina strongly extends the range of the family.

## Material & methods

### List of species examined:

*Sphaerius texanus* MATTHEWS: USA, Arizona, Sycamore Cañon, III.1997, R.G. Beutel

*Sphaerius politus* HORN: USA, California, Riverside County, Santa Ana River, Riverside, 2.XI.1966, G.L. Peters; California, Los Angeles County, Mission Creek, Santa Barbara, F.E. Winters (loan from National Museum of Natural History, Smithsonian Institution, Washington DC)

Undetermined specimens from Venezuela: 40 Km S Puerto Ayacucho, El Tobogan, Coromoto, 24.I.1989, P.J. Spangler, R.A. Faitoute & C.B. Barr (loan from National Museum of Natural History, Smithsonian Institution, Washington DC)

Undetermined specimens from Ecuador: Napo, Puerto Nuevo, 8.VII.1976, at black light, J. Cohen (loan from National Museum of Natural History, Smithsonian Institution, Washington DC)

Undetermined specimens from Peru: Madre de Dios, Hostel Erica, near Salvación, 12°53'S 71°14'W, 550 m, Rio Culli, R.A. Faitoute; Cusco, Quince Mil, 28.I.1979, W. Steiner (loan from National Museum of Natural History, Smithsonian Institution, Washington DC)

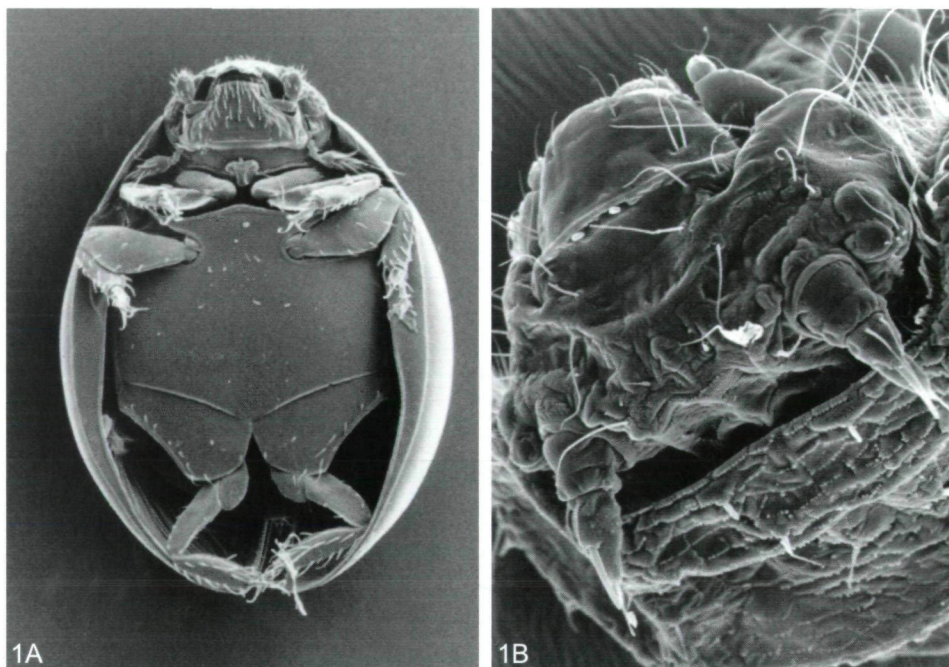


Fig. 1: SEM photographs of *Sphaerius texanus*, A) adult, ventral view; B) larval head, anterolateral view.

Undetermined specimens from Taiwan: Kao Hsiung County, 10-11 km NE Chiahsien, forest, ca. 300 m, VII.1980, D.R. Davis (loan from National Museum of Natural History, Smithsonian Institution, Washington DC)

Undetermined specimens from Argentina: see below under "First family record for Argentina"

For scanning electron microscopy adults and larvae of *Sphaerius texanus* were cleaned with ultrasonic sound, dried (critical point) and coated with gold.

### **Sphaeriusidae ERICHSON, 1845**

Sphaeriusidae is one of four families of the coleopteran suborder Myxophaga and the sistergroup of the family Hydrosaphidae (BEUTEL et al. 1998, BEUTEL 1999). The only genus *Sphaerius* comprises 19 species (ENDRÖDY-YOUNGA 1997). It is recorded from Europe (3 spp.), North- and Central America (4 spp.), Asia (8 spp.), Madagascar (1 spp.), Australia (2 spp.) and Africa (1 spp.) (REICHARDT 1973, ARCE PÉREZ 1997, ENDRÖDY-YOUNGA 1997). *Sphaerius* species usually live in moist substrate at river edges (see e.g. ARCE PÉREZ 1997). However, species discovered in Asia (LÖBL 1995, JÄCH 1998) and *S. africanus* ENDRÖDY-YOUNGA from the eastern part of southern Africa (ENDRÖDY-YOUNGA 1997), are apparently strictly terrestrial. Riparian sphaeriusids are often collected in association with hydraenids, small hydrophilids and limnichids. Food preferences are not definitely known, but detailed field notes suggest that they are algophagous and may facultatively feed on Myxomycetes (ARCE PÉREZ 1997, ROBERTO ARCE PÉREZ, pers. comm.). Adults of *Sphaerius* (Fig. 1A; BRITTON 1966: Figs. 1-5) are easily recognized by their very small size (0.5 – 1.2 mm), the hemispherical body shape, the smooth and shiny cuticle, antennae with a distinct 3-segmented club, subulate apical maxillary

palpomeres, a very short, mesoventrite, which is fused with the unusually long metaventrite, and alae with a strongly reduced anal field and complete fringe of hairs with helical structure. The few known larvae (Fig. 1B; BRITTON 1966: Figs.: 6-8, BEUTEL et al. 1998: Figs. 5-7) are characterized by an unusual slug-like pattern of locomotion, tergites with long lateral contact hairs, scale-like, serrate surface structures, strongly developed and posteriorly directed antennae, a pair of cone-shaped sensorial structures inserting in the clypeolabral suture, balloon-shaped spiracular gills inserting at the abdominal tergites I-VIII, and a segment X with three semimembranous lobes with a pair of hooks each.

First family record for Argentina

MATERIAL EXAMINED:

ARGENTINA: PROVINCIA DE CÓRDOBA: 1 ex.: Río Cuarto City, shore of Chocancharava (Cuarto) River (33°08'S 64°21'W, 439 m a.s.l., seventh order stream), collected with fine water net (mesh size 250 µm) from water surface after pouring water over the substrate and vegetation of the river edge, 8.III.2002, leg. et det. Rolf G. Beutel. This specimen is deposited in the collection of Rolf G. Beutel (Institut für Spezielle Zoologie mit Phyletischem Museum). - 1 ex.: upper basin of the Chocancharava River, Las Cañitas stream (32°49'S 64°44'W, 700 m a.s.l., second order streams), collected with drift net (mesh size 300 µm), 8.III.2002, leg. Graciela B. Raffaini, det. Rolf G. Beutel. The specimen is presently in the laboratory of Rolf G. Beutel and will be deposited in the collection of the Departamento de Ciencias Naturales (aquatic Coleoptera group), Universidad Nacional de Río Cuarto (Río Cuarto, Argentina).

Chocancharava River (Fig. 2) is a tributary of Carcarañá River. 48 taxa of aquatic Coleoptera were collected in this river system during a recent survey (CORIGLIANO & RAFFAINI 2001), however *Sphaerius* was not among them.

The first specimen was collected during a field trip to a recreational area at the Chocancharava River within the city limits of Río Cuarto City. Apparently the beetles (and larvae) live in the substrate of the marginal zone, between roots of plants as other species of this group (e.g. *S. texanus*; pers.obs., Beutel; ENDRÖDY-YOUNGA 1997).

Both specimens are 0.9 mm long, and about 1.5 x as long as broad. The colour is dark brown (including appendages). The head is rather small compared to rest of the body. They probably represent the same species.

species / characters	size	colour, dorsal side	colour, appendages	head
<i>S. politus</i>	0.75 mm	dark castaneous	rufo-ferrugineous	large, produced in front
<i>S. texanus</i>	0.5 mm	brown	piceous	large and prominent
<i>S. tropicus</i>	0.63 mm	deep black	yellow	large, produced in front
<i>S. sp. (Argentina)</i>	0.9 mm	dark brown	dark brown	normally sized, not produced in front
<i>S. sp. (Venezuela)</i>	0.6 mm	dark brown	brown	fairly large, produced in front
<i>S. sp. (Ecuador)</i>	0.7 - 0.75 mm	almost black	very dark brown	normally sized, not produced in front

Tab. 1: Character list of *Sphaerius* spp.<sup>1</sup>

<sup>1</sup> Characters for *Sphaerius politus* and *S. tropicus* are from MATTHEWS (1899)



Fig. 2: Collecting site: Río Chocancharava (Río Cuarto), Río Cuarto City, Córdoba, Argentina.

### Discussion

It was pointed out by REICHARDT (1973) that the absence of the family Sphaeriidae from South America may be due to the lack of collecting in suitable habitats, and the very small size of the beetles. An additional problem may be the proper collecting techniques. *Sphaerius* species can be found only accidentally with methods usually applied to aquatic and terrestrial beetles.

The specimens collected at the Chocancharava and Las Cañitas rivers differ distinctly from other species of North- and Central- and South America (see Tab. 1). The total length is 0.90 mm versus 0.63 in *S. tropicus*, 0.75 mm in *S. politus* (California), 0.5 mm in *S. texanus* (MATTHEWS 1899, pers. obs. BEUTEL) and 0.6 - 0.7 mm in specimens from Peru, Ecuador and Venezuela. The colouration is darker than in specimens of *S. texanus*, but not black as in *S. tropicus* (MATTHEWS 1899). The legs are darker than in *S. tropicus*, and the head is comparatively small and not produced in front, as it seems to be characteristic in *S. tropicus* and *S. politus*. A status as a new species appears likely considering these morphological differences and the gap in the distribution. However, a formal description will be only considered when more specimens from Argentina are available.



The present knowledge of the morphology of Sphaeriidae is scarce. MATTHEWS (1899) provided illustrations, which are excellent considering the time of publication and the size of the beetles. However, morphological details can only be properly perceived if SEM (scanning electronic microscopy) techniques are applied, and this would be necessary for a reliable morphological description of the species, especially of unidentified material from South America. Presently, only few SEM pictures are published (ENDRÖDY-YOUNGA 1997: elytra, Figs. 1-2, BEUTEL 1999: ventral aspect, head, Figs. 6, 9) and almost all species remain very insufficiently documented. It is apparent that the state of sphaeriid taxonomy is not satisfying. Therefore a thorough morphological and taxonomic treatment of the family would be highly desirable.

### Acknowledgements

We wish to thank Dr. Paul J. Spangler and Dr. Warren E. Steiner for arranging the loan of valuable material from the National Museum of Natural History, Smithsonian Institution (Washington DC). The permanent and intensive support by Dr. Adolfo Martino, Dra. Maria Corigliano, Dra. Cristina Gualdoni and Msc. Ana Oberto (Departamento de Ciencias Naturales, Universidad de Río Cuarto) is gratefully acknowledged. Photos of the collecting site were provided by Dr. Adolfo Martino. We also thank Daniel Maza (Departamento de Producción Audiovisual, UNRC) for providing transportation facilities and documenting the collecting with a video camera. Finally, we are grateful to Prof. Dra. Estela Monteresino for providing laboratory facilities.

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Band/Volume: [73 2003](#)

Autor(en)/Author(s): Beutel Rolf Georg, Raffaini Garciela B.

Artikel/Article: [First record of Sphaeriusidae for Argentina \(Sphaeriusidae\). 1-6](#)