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## Aquatic Oligochaeta (Annelida: Clitellata) from State of São Paulo, Brazil: Diversity and Occurrence review

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**Abstract:** More than 5.000 species are described to Class Oligochaeta, and approximately 1650 aquatic species are recognized around the world. Knowledge regarding abundance and composition of limnic oligochaetes can be used as an indicator of water and sediment quality. Thus, this paper aims to summarize all published data on aquatic Oligochaeta from State of São Paulo (Brazil), in order to establish a checklist of microdrili from the State. The list emphasizes the diversity of limnic oligochaetes and provides a general overview of their distribution and also ecological aspects. Were examined the bibliographical data on São Paulo aquatic Oligochaeta, including species catalogs and taxonomic and ecological literature. Were analyzed a total of 34 academic researches, 32 journal papers and two taxonomic catalogs. This analysis resulted in a list of 75 valid species, distributed in 24 genera and five families. This amount of taxa corresponds to 4.5% of the aquatic Oligochaeta worldwide valid species, and about 87% of the Brazilian species.

**Keywords:** Limnic oligochaetes, Species list, Occurrence, São Paulo.

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**Resumo:** Mais de 5.000 espécies são descritas para a Classe Oligochaeta e aproximadamente 1650 espécies aquáticas são reconhecidas em todo o mundo. O conhecimento sobre a composição e abundância de oligoquetos límnicos pode ser um indicador de qualidade da água e/ou sedimento. Assim, este trabalho teve como objetivo reunir todas as informações publicadas sobre Oligochaeta aquático do Estado de São Paulo (Brasil), a fim de estabelecer uma lista de táxons de microdrili registrados. A lista destaca a diversidade de oligoquetos límnicos e fornece uma visão geral de sua distribuição e aspectos ecológicos. Para isso, foram examinados dados bibliográficos de Oligochaeta aquáticos em São Paulo, incluindo catálogos de espécies, bem como artigos sobre taxonomia e de ecologia. Foram analisados o total de 34 trabalhos acadêmicos, sendo 32 artigos e dois catálogos taxonômicos. Esta análise resultou em uma lista de 75 espécies válidas, distribuídas em 24 gêneros e cinco famílias. Este montante corresponde a 4,5% das espécies de Oligochaeta aquático registradas no mundo, e aproximadamente 87 % das espécies brasileiras.

**Palavras-chave:** Oligoquetos límnicos, Lista de espécies, Ocorrência, São Paulo.

## Introduction

The Class Oligochaeta is included into the Phylum Annelida, together with Hirudinea and Polychaeta. The main characteristic of the phylum is the metameric body construction. It means the body is subdivided in similar segments (or “rings”) arranged along the antero-posterior axis of the body (Righi 2002).

More than 5.000 species are described to Oligochaeta. The majority of them are terrestrial earthworms (megadrile). Being

relatively low the number of freshwater, semi terrestrial or marine forms (microdrile). Approximately 1650 aquatic Oligochaeta are recognized as valid species around the world (Martin et al. 2008). In Brazil the number of valid species is around 86, excluding the Enchytraeidae Family (Christoffersen 2007). In continental aquatic environments the abundance and composition of Oligochaeta can be an indicator for water and sediment quality (Lafont 1984, Marchese & Drago 1999, Alves & Strixino 2000).

The knowledge about the Brazilian freshwater Oligochaeta is very fragmented and incomplete, even these organisms being very common in continental aquatic environments (Timm et al. 2001). However, the publication of books in the eighties - specifically focused on the identification of oligochaetes in Brazil and South America (Righi 1984, Brinkhurst & Marchese 1989, respectively) – encouraged researches as Takeda (1999, 2001), Montanholi-Martins & Takeda (1999, 2001), Alves & Lucca (2000), Alves & Strixino (2000), Pamplin et al. (2005), Alves et al. (2006, 2008), Gorni & Alves (2008a, 2008b, 2012), Martins & Alves (2010) and Rodrigues et al. (2013a, 2013b), which have broadened the knowledge on taxonomic and ecological aspects of these worms in Brazil.

The objective of this paper is to summarize all published data on aquatic Oligochaeta from State of São Paulo (Brazil), in order to establish a checklist of known microdrili taxa from the State. The list emphasizes the diversity of limnic oligochaetes and provides a general overview of their distribution and also ecological aspects.

## Material and methods

Were examined the bibliographical data on São Paulo aquatic Oligochaeta, including species catalog, and taxonomic and ecological literature. The literature was surveyed by searching academic databases (Scopus, Scielo, and Google Scholar), and the scientific publications with reports of limnic oligochaetes. Aiming covering the greatest number of publications, were consulted academic papers published from 1942 through 2014.

## Results and discussion

A total of 34 studies about São Paulo aquatic Oligochaeta were analyzed, including 32 journal papers and 2 taxonomic catalogs. The list of taxa includes 75 valid species, distributed in 24 genera and five families. This amount of species corresponds to 4.5% of the aquatic Oligochaeta worldwide valid species, and about 87% of the Brazilian species (Christoffersen 2007, Martin et al. 2008). This checklist is shown below, divided into families, genera and species, following alphabetical order.

### Checklist and classification

#### Aelosomatidae

##### *Aelosoma aerum* Marcus, 1944

##### **Records: ecological remarks**

São Paulo: Serra da Cantareira streams associated with the bryophyte *Dumortiera* sp. (Marcus 1944).

##### *Aelosoma corderoi* Du Bois Reymond Marcus, 1944

##### **Records:**

São Paulo: Tietê River (Du Bois Reymond Marcus 1944).

##### *Aelosoma evelinae* Marcus, 1944

##### **Records: ecological remarks**

São Paulo: Pinheiros River, sediment (Marcus 1944).

##### *Aelosoma gertae* Marcus, 1944

##### **Records: ecological remarks**

São Paulo: associated with the aquatic macrophyte *Eichhornia crassipes* (Marcus 1944).

##### *Aelosoma headleyi* Beddard, 1888

##### **Records: ecological remarks**

São Paulo: associated with the aquatic macrophyte *Eichhornia crassipes* (Marcus 1944).

##### *Aelosoma hemprichi* Ehrenberg, 1831

##### **Records: ecological remarks**

São Paulo: University of São Paulo Campus associated with the Bromeliaceae (Marcus 1944).

##### *Aelosoma sawayai* Marcus, 1944

##### **Records:**

São Paulo and Mogi das Cruzes (Marcus 1944).

##### *Aelosoma travancorensis* Aiyer, 1926

##### **Records:**

São Paulo, Mogi das Cruzes and Pirassununga (Marcus 1944).

##### *Aelosoma viride* Stephenson, 1911

##### **Records: ecological remarks**

São Paulo: Pinheiros River tributaries, sediment and associated with the Bromeliaceae (Marcus 1944).

#### Alluroididae

##### *Brinkhurstia americana* (Brinkhurst, 1964)

##### **Records: ecological remarks**

Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000). Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, sediment of Ponte Nova and Bariri Dams (Pamplin et al. 2005). Araraquara: Pinheirinho Stream, sediment (Alves et al. 2006).

#### Naididae

##### *Allodero lutzi* (Michaelsen, 1926)

*Dero* (*Allodero*) *lutzi*, Righi 1984: 26-27.

##### **Records:**

São Paulo (Righi 1984).

##### *Allonais chelata* (Marcus, 1944)

##### **Records: ecological remarks**

Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007).

##### *Allonais inaequalis* (Stephenson, 1911)

##### **Records: ecological remarks**

Araraquara: Pinheirinho Stream, sediment (Alves et al. 2006), and Cruzes Stream, associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007), and in Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

##### *Allonais paraguayensis paraguayensis* (Michaelsen, 1905)

*Nais paraguayensis*, Marcus 1943: 23-31.

*Allonais paraguayensis*, Correia & Trivinho-Strixino 1998: 41; Trivinho-Strixino et al. 2000: 533; Alves & De Lucca 2000: 115; Corbi & Trivinho-Strixino 2002: 38; Pamplin et al. 2005: 67; Janke & Trivinho-Strixino 2007: 112; Gorni & Alves 2008b: 163; Gorni & Alves 2012: 107.

*Allonais lairdi*, Pamplin et al. 2005: 67.

##### **Records: ecological remarks**

São Paulo: Pinheiros River tributaries, sediment and Pirassununga: Mogi-Guaçu River and Cachoeira de Emas Reservoir, sediment (Marcus 1943). Luiz Antônio: Mogi-Guaçu River, associated with the aquatic macrophyte *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000). Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000). Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, Ponte Nova and

Bariri Dams, sediment (Pamplin et al. 2005). São Carlos: Fazzari Stream, leaf litter (Janke & Trivinho-Strixino 2007). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Amphichaeta leydigii* Tauber, 1879**

**Records:**

Ribeirão Grande: Intervales State Park Streams (Alves et al. 2008).

***Aulodrilus limnobius* Bretscher, 1899**

**Records: ecological remarks**

São Paulo: Pinheiros River, sediment (Marcus 1944). Ribeirão Grande: Intervales State Park Streams (Alves et al. 2008). Campos do Jordão: Galharada and Serrote Streams, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Aulodrilus pigueti* Kowalewski, 1914**

**Records: ecological remarks**

Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000). Luiz Antonio: Mogi-Guaçu River, sediment (Alves & Strixino 2003).

***Aulophorus borellii* (Michaelson, 1900)**

*Dero* (*Aulophorus*) *borellii*, Correia & Trivinho-Strixino 1998: 41; Trivinho-Strixino et al. 2000: 533; Alves & De Lucca 2000: 115.

**Records: ecological remarks**

Luiz Antônio: Mogi-Guaçu River, associated with the aquatic macrophyte *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000). Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000).

***Aulophorus carteri* Stephenson, 1931**

*Dero* (*Aulophorus*) *carteri*, Correia & Trivinho-Strixino 1998: 41; Trivinho-Strixino et al. 2000: 533.

**Records: ecological remarks**

Pirassununga: Mogi-Guaçu River, Cachoeira de Emas Reservoir, sediment (Marcus 1943). Luiz Antônio: Mogi-Guaçu River, associated with aquatic macrophytes, *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000).

***Aulophorus costatus* Du Bois-Reymond Marcus, 1944**

*Dero* (*Aulophorus*) *costatus*, Alves & Gorni 2007: 409; Gorni & Alves 2008a: 262.

**Records: ecological remarks**

Américo Brasileiro: Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Aulophorus furcatus* (O. F. Müller, 1774)**

*Dero* (*Aulophorus*) *furcatus*, Pamplin et al. 2005: 67; Gorni & Alves 2006: 1060; Suriani et al. 2007: 420-421.

**Records: ecological remarks**

São Paulo: sediment of Pinheiros and Tietê Rivers tributaries (Marcus 1943). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Araraquara: Cruzes Stream, associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment (Suriani et al. 2007).

***Aulophorus hymanae* (Naidu, 1962)**

*Dero* (*Aulophorus*) *hymanae*, Suriani et al. 2007: 420-421.

**Records: ecological remarks**

Promissão: Tietê River, sediment of Promissão Reservoir, Buritama: Tietê River, Nova Avanhandava Reservoir, sediment.

Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007).

***Aulophorus lodei* (Brinkhurst, 1986)**

*Dero* (*Aulophorus*) *lodei*, Correia & Trivinho-Strixino 1998: 41; Trivinho-Strixino et al. 2000: 533; Corbi & Trivinho-Strixino 2002: 38; Pamplin et al. 2005: 67; Suriani et al. 2007: 420-421.

**Records: ecological remarks**

Luiz Antônio: Mogi-Guaçu River, associated with the aquatic macrophyte *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000). Américo Brasileiro: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment. Ibitinga: Tietê River, Ibitinga Reservoir, sediment. Promissão: Tietê River, Promissão Reservoir, sediment. Buritama: Tietê River, Nova Avanhandava Reservoir, sediment. Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007).

***Aulophorus superterrenus* Michaelson, 1912**

**Records: ecological remarks**

São Paulo and Campinas: associated with the epiphytic *Vriesea* sp. (Bromeliaceae) (Marcus 1943).

***Bothrioneurum americanum* Beddard, 1894**

**Records: ecological remarks**

Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005).

***Bothrioneurum iris* Beddard, 1901**

**Records: ecological remarks**

São Paulo: leaf litter of Tietê River (Marcus 1942).

***Bothrioneurum vej dovskyanum* Stolc, 1886**

*Bothrioneurum pyrrhum*, Marcus 1942: 201-205.

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1942).

***Branchiura sowerbyi* Beddard, 1892**

*Branchiura sowerbyi*, Alves & Strixino 2003: 4; Dornfeld et al. 2006: 193; Fusari & Fonseca-Gessner 2006: 93; Pamplin et al. 2006: 126.

**Records: ecological remarks**

Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000, Alves & Strixino 2003). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Americana: Atibaia River, Salto Grande Dam, sediment (Dornfeld et al. 2006). Americana: Americana Dam, sediment (Pamplin et al. 2006). São Carlos: Monjolinho Dam, sediment (Fusari & Fonseca-Gessner 2006). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment; Bariri: Tietê River, Bariri Reservoir, sediment; Ibitinga: Tietê River, Ibitinga Reservoir, sediment; Promissão: Tietê River, Promissão Reservoir, sediment; Buritama: Tietê River, Nova Avanhandava Reservoir, sediment and Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007).

***Chaetogaster diaphanus* (Gruithuisen, 1828)**

**Records: ecological remarks**

Araraquara: Cruzes Stream, associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Chaetogaster diastrophus* (Gruithuisen, 1828)**

**Records: ecological remarks**



São Paulo and Campinas: Tietê River sediment and associated with Bromeliaceae (Marcus 1943). Ipeúna: Cantagalo and Lapa Streams, associated with the Odonata larvae *Elasmothermis cannacrioides* and *Mnesarete* sp. (Corbi et al. 2004). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a). Campos do Jordão: Galharada and Serrote Streams, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Chaetogaster langi* Bretscher, 1896**

*Chaetogaster parvus*, Marcus 1943: 15.

*Chaetogaster spongillae*, Marcus 1943: 16.

**Records: ecological remarks**

São Paulo: Pinheiros River, sediment. Águas de São Pedro: Piracicaba River Basin, Araquá River sediment and Southern State of São Paulo: Ribeira de Iguape River, associated with the sponge *Ephydatia crateriformis* (Marcus 1943).

***Chaetogaster limnaii limnaii* K. Von Baer, 1827**

**Records: ecological remarks**

São Paulo: associated with the gastropod *Australorbis* sp. (Du Bois-Reymond Marcus 1947).

***Dero botrytis* Marcus, 1943**

*Dero (Dero) botrytis*, Pamplin et al. 2005: 67.

**Records: ecological remarks**

São Paulo: São Paulo University Campus (Marcus 1943). Águas de São Pedro: Piracicaba River Basin, sediment of Limoeiro Dam (Marcus 1944). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005).

***Dero digitata* (O.F. Müller, 1773)**

*Dero (Dero) digitata*, Alves & De Lucca 2000: 115; Pamplin et al. 2005: 67; Gorni & Alves 2006: 1060; Alves & Gorni 2007: 409; Suriani et al. 2007: 420-421.

**Records: ecological remarks**

Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Araraquara: associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Bariri: Tietê River, Bariri Reservoir, sediment (Suriani et al. 2007).

***Dero evelinae* Marcus, 1943**

*Dero (Dero) evelinae*, Correia & Trivinho-Strixino 1998: 41; Trivinho-Strixino et al. 2000: 533; Pamplin et al. 2005: 67; Fusari & Fonseca-Gessner 2006: 93; Suriani et al. 2007: 420-421; Alves & Gorni 2007: 409.

**Records: ecological remarks**

São Paulo: University of São Paulo Campus (Marcus 1943). Luiz Antônio: Mogi-Guaçu River, associated with the aquatic macrophyte *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). São Carlos: Fazzari Dam, sediment (Fusari & Fonseca-Gessner 2006). Bariri: Tietê River, Bariri Reservoir, sediment (Suriani et al. 2007). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007).

***Dero multibranchiata* Stieren, 1892**

*Dero (Dero) multibranchiata*, Corbi & Trivinho-Strixino 2002: 38; Pamplin et al. 2005: 67; Suriani et al. 2007: 420-421.

**Records: ecological remarks**

Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri:

Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Bariri: Tietê River, Bariri Reservoir, sediment (Suriani et al. 2007).

***Dero nivea* Aiyer, 1930**

*Dero (Dero) nivea*, Correia & Trivinho-Strixino 1998: 41; Trivinho-Strixino et al. 2000: 533; Alves & Strixino 2000: 177; Corbi & Trivinho-Strixino 2002: 38; Pamplin et al. 2005: 67; Gorni & Alves 2006: 1060; Suriani et al. 2007: 420-421; Alves & Gorni 2007: 409; Gorni & Alves 2008a: 262.

**Records: ecological remarks**

Luiz Antônio: Mogi-Guaçu River, associated with the aquatic macrophyte *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000), and sediment (Alves & Strixino 2000). Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Araraquara: associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment; Bariri: Tietê River, Bariri Reservoir, sediment (Suriani et al. 2007). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Dero obtusa* D'Udekem, 1855**

*Dero (Dero) obtusa*, Alves & De Lucca 2000: 115; Corbi & Trivinho-Strixino 2002: 38; Pamplin et al. 2005: 67; Gorni & Alves 2006: 1060; Suriani et al. 2007: 420-421; Alves & Gorni 2007: 409; Gorni & Alves 2008a: 262.

**Records: ecological remarks**

São Paulo: Pinheiros River tributaries, sediment (Marcus 1943). Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000). Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Araraquara: Cruzes Stream, associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment (Suriani et al. 2007). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Dero pectinata* Aiyer, 1930**

*Dero (Dero) pectinata*, Pamplin et al. 2005: 67; Suriani et al. 2007: 420-421.

**Records: ecological remarks**

Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Ibitinga: Tietê River, Ibitinga Reservoir, sediment (Suriani et al. 2007).

***Dero plumosa* Naidu, 1962**

*Dero (Dero) plumosa*, Alves & Strixino 2000: 177.

**Records: ecological remarks**

Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000).

***Dero raviensis* (Stephenson, 1914)**

*Dero (Dero) raviensis*, Alves et al. 2006: 434; Gorni & Alves 2006: 1060; Alves & Gorni 2007: 409; Gorni & Alves 2008a: 262.

**Records: ecological remarks**

Araraquara: Pinheirinho Stream, sediment and associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006).

São Carlos: Monjolinho River, sediment (Alves et al. 2006). Brotas and Américo Brasileiro: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Dero sawyai* Marcus, 1943**

*Dero* (*Dero*) *sawayai*, Gorni & Alves 2006: 1060; Alves & Gorni 2007: 409; Gorni & Alves 2008a: 262.

**Records: ecological remarks**

São Paulo: Pinheiros River tributaries, sediment (Marcus 1943). Araraquara: associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Brotas and Américo Brasileiro: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Haemonais waldvogeli* Bretscher, 1900**

**Records: ecological remarks**

Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005, Suriani et al. 2007). Araraquara: Pinheirinho Stream, sediment (Alves et al. 2006), and associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006).

***Jolydrilus jaulus* Marcus, 1965**

**Records: ecological remarks**

Cananéia and Cubatão: mangrove sediment (Marcus 1965).

***Limnodrilus hoffmeisteri* Claparède, 1862**

*Limnodrilus hoffmeisteri* f. *divergens*, Marcus 1942: 169-174. *Limnodrilus hoffmeisteri* f. *parva*, Marcus 1942: 167-169.

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1942). Pirituba (Mendes et al. 1951). Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000, Alves & Strixino 2003). Araraquara: Pinheirinho, Santa Clara and Água Branca Streams, sediment (Alves & De Lucca 2000, Alves et al. 2006). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). São Carlos: Monjolinho River, sediment (Alves et al. 2006, Fusari & Fonseca-Gessner 2006). Ribeirão Preto: Pardo River, sediment of Monte Alegre Lake (Cleto-Filho & Arcifa 2006). Americana: Atibaia River, Salto Grande Dam, sediment (Dornfeld et al. 2006). Americana: Americana Dam, sediment (Pamplin et al. 2006). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment; Bariri: Tietê River, Bariri Reservoir, sediment. Ibitinga: Tietê River, Ibitinga Reservoir, sediment; Promissão: Tietê River, Promissão Reservoir, sediment; Buritama: Tietê River, Nova Avanhandava Reservoir, sediment and Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007). Ribeirão Grande: Intervalles State Park Streams (Alves et al. 2008). Campos do Jordão: Galharada and Serrote Streams, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Limnodrilus neotropicus* Černosvitov, 1939**

**Records: ecological remarks**

Araraquara: Água Branca Stream, sediment (Alves et al. 2006). São Carlos: Gouveia Stream, sediment (Alves et al. 2006). Ribeirão Grande: Intervalles State Park Streams (Alves et al. 2008).

***Limnodrilus udekemianus* Claparède, 1862**

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1942). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri

Dams, sediment (Pamplin et al. 2005). São Carlos: Monjolinho River, sediment (Alves et al. 2006). Buritama: Tietê River, Nova Avanhandava Reservoir, sediment (Suriani et al. 2007). Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007).

***Monopylephorus parvus* Ditlevsen, 1904**

**Records: ecological remarks**

Cananéia: mangrove sediment (Marcus 1965).

***Nais communis* Piguet, 1906**

*Nais communis* f. *magenta*, Marcus 1943: 23.

**Records: ecological remarks**

Southern State of São Paulo: Ribeira de Iguape River, associated with the sponge *Ephydatia crateriformis* (Marcus 1943). São Paulo: Tietê River and Pinheiros River tributaries, sediment (Marcus 1943). Luiz Antônio: Mogi-Guaçu River, associated with aquatic macrophytes (Trivinho-Strixino et al. 2000). Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000), and associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). São Carlos: Jacaré-Guaçu River, associated with the sponge *Radiospongilla amazonensis* (Corbi et al. 2005), and Monjolinho River, sediment (Alves et al. 2006). Brotas and Américo Brasileiro: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Brotas: Jacaré-Pepira River, associated with the bryophytes *Fissidens* sp. and *Philonotis* sp. (Gorni & Alves 2007), and Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a). Ribeirão Grande: Intervalles State Park Streams (Alves et al. 2008). Campos do Jordão: Campo do Meio and Galharada Streams, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Nais elinguis* O. F. Müller, 1774**

**Records: ecological remarks**

Araraquara: associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006).

***Nais pardalis* Piguet, 1906**

**Records: ecological remarks**

São Paulo: Pinheiros River tributaries, sediment (Marcus 1943). Araraquara: associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006).

***Nais variabilis* Piguet, 1906**

**Records: ecological remarks**

Ipeúna: Cantagalo and Lapa Streams, associated with the Odonata larvae *Elasmothermis cannaeoides* and *Mnesarete* sp. (Corbi et al. 2004). Brotas and Américo Brasileiro: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni and Alves 2008b, Gorni & Alves 2012).

***Paranais evelinae* (Marcus, 1965)**

*Wapsa evelinae*, Marcus 1965: 63.

**Records: ecological remarks**

Cananéia: mangrove sediment (Marcus 1965).

***Pristina aequiseta aequiseta* Bourne, 1891**

*Pristina aequiseta*, Marcus 1943: 104-106, Alves et al. 2006: 434, Gorni & Alves 2008a: 262.

*Pristina evelinae*, Marcus 1943: 112-125.

**Records: ecological remarks**

São Paulo: Pinheiros River tributaries, sediment; Pirassununga: Mogi-Guaçu River, Cachoeira de Emas Reservoir, sediment and Águas de São Pedro: Piracicaba River Basin, Araquá River, sediment (Marcus 1943). Southern

State of São Paulo: Ribeira de Iguape River, associated with the sponge *Ephydatia crateriformis* (Marcus 1943). Araraquara: Água Branca Stream, sediment (Alves et al. 2006). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Pristina americana* Cernosvitov, 1937**

*Pristinella longidentata*, Alves & Strixino 2000: 177; Gorni & Alves 2008b: 163.

*Pristina (Pristinella) longidentata*, Gorni & Alves 2012: 107.

**Records: ecological remarks**

São Paulo: Pinheiros and Tietê Rivers, sediment (Marcus 1943). Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000). Araraquara: Pinheirinho and Santa Clara Streams, sediment (Alves & De Lucca 2000). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). São Carlos: Monjolinho River, sediment (Alves et al. 2006). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment; Bariri: Tietê River, Bariri Reservoir, sediment; Ibitinga: Tietê River, Ibitinga Reservoir, sediment; Promissão: Tietê River, Promissão Reservoir, sediment; Buritama: Tietê River, Nova Avanhandava Reservoir, sediment and Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni & Alves 2008b).

***Pristina biserrata* Chen, 1940**

**Records: ecological remarks**

Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007), and with the sponge *Metania spinata* (Gorni & Alves 2008a). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni & Alves 2008b).

***Pristina breviseta* Bourne, 1891**

*Naidium breviseta*, Marcus 1943: 128-129.

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1943). Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). São Carlos: Fazzari Dam, sediment (Fusari & Fonseca-Gessner 2006).

***Pristina longiseta* Ehrenberg, 1828**

*Pristina leidyi*, Alves & Strixino 2003: 4; Gorni & Alves 2006: 1060; Alves & Gorni 2007: 409; Gorni & Alves 2008a: 262; Gorni & Alves 2008b: 163; Gorni & Alves 2012: 107.

**Records: ecological remarks**

Southern State of São Paulo: Ribeira de Iguape River, associated with the sponge *Ephydatia crateriformis*, and Águas de São Pedro: Piracicaba River Basin, Araquá River, sediment (Marcus 1943). Luiz Antonio: Mogi-Guaçu River, sediment (Alves & Strixino 2003). Araraquara: associated with the gastropod *Pomacea bridgesii* (Gorni & Alves 2006). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007), and with the sponge *Metania spinata* (Gorni & Alves 2008a). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Pristina macrochaeta* Stephenson, 1931**

**Records: ecological remarks**

São Paulo: Pinheiros River, sediment (Marcus 1943). Campinas: Atibaia River, sediment (Marcus 1944). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007), and with the sponge *Metania spinata* (Gorni & Alves 2008a).

***Pristina menoni* (Aiyer, 1929)**

*Pristinella menoni*, Alves et al. 2006: 434; Gorni & Alves 2007: 519.

**Records: ecological remarks**

Araraquara: Pinheirinho Stream, sediment (Alves et al. 2006). Brotas: Jacaré-Pepira River, associated with the bryophytes *Fissidens* sp. and *Philonotis* sp. (Gorni & Alves 2007).

***Pristina notopoda* Černosvitov, 1937**

*Pristinella notopora*, Gorni & Alves 2008b: 163.

*Pristina (Pristinella) notopora*, Gorni & Alves 2012: 107.

**Records: ecological remarks**

Campos do Jordão: Campo do Meio, Galharada and Serrote Streams, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Pristina osborni* (Walton, 1906)**

*Naidium minutum*, Marcus 1943: 129-130.

*Pristinella osborni*, Alves & Gorni 2007: 409; Alves et al. 2008: 71.

*Pristinella minuta*, Gorni & Alves 2008b: 163.

*Pristina (Pristinella) minuta*, Gorni & Alves 2012: 107.

**Records: ecological remarks**

Águas de São Pedro: Piracicaba River Basin, Araquá River, sediment (Marcus 1943). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Ribeirão Grande: Intervales State Park Streams (Alves et al. 2008). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Pristina proboscidea* Beddard, 1896**

**Records: ecological remarks**

São Carlos: Jacaré-Guaçu River, associated with the sponge *Radiospongilla amazonensis* (Corbi et al. 2005). Araraquara: Água Branca Stream, sediment (Alves et al. 2006). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007). Brotas: Lagoa Dourada Dam, associated with the sponge *Metania spinata* (Gorni & Alves 2008a). Campos do Jordão: Galharada Stream, sediment and leaf litter (Gorni & Alves 2008b, Gorni & Alves 2012).

***Pristina rosea* (Piguet, 1906)**

*Naidium roseum*, Marcus 1943: 130-132; Marcus 1944: 50.

*Pristinella jenkinsae*, Alves et al. 2006: 434; Fusari & Fonseca-Gessner 2006: 93; Gorni & Alves 2007: 519; Gorni & Alves 2008b: 163; Gorni & Alves 2012: 107.

**Records: ecological remarks**

São Paulo: University of São Paulo Campus, and Pinheiros River tributaries, sediment (Marcus 1943), Tietê River, associated with the plant *Calathea* sp. (Marcus 1944). Araraquara: Pinheirinho and Água Branca Streams, sediment (Alves et al. 2006). São Carlos: Gouveia Stream, sediment (Alves et al. 2006), and Monjolinho Dam, sediment (Fusari & Fonseca-Gessner 2006). Brotas: Jacaré-Pepira River, associated with the bryophytes *Fissidens* sp. and *Philonotis* sp. (Gorni & Alves 2007). Campos do Jordão: Campo do Meio Stream, Galharada and Serrote Streams, leaf litter and sediment (Gorni & Alves 2008b, Gorni & Alves 2012).

***Pristina sima* (Marcus, 1944)**

*Naidium simum*, Marcus 1944: 68-69.

*Pristinella sima*, Gorni & Alves 2008b: 163.

*Pristina (Pristinella) sima*, Gorni & Alves 2012: 107.

**Records: ecological remarks**



São Paulo: associated with the bryophyte *Dumortiera* sp. (Marcus 1944). Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000). Campos do Jordão: Galharada and Serrote Streams, leaf litter and sediment (Gorni & Alves 2008b, Gorni & Alves 2012).

***Pristina synclites* Stephenson, 1925**

**Records: ecological remarks**

Araraquara: Pinheirinho Stream, sediment (Alves et al. 2006). São Carlos: Monjolinho River, sediment (Alves et al. 2006, Fusari & Fonseca-Gessner 2006).

***Slavina appendiculata* (D'Udekem, 1855)**

**Records: ecological remarks**

São Carlos: Gouveia Stream, sediment (Alves et al. 2006).

***Slavina evelinae* (Marcus, 1942)**

*Peloscolex evelinae*, Marcus 1942: 157-159.

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1942). Luiz Antônio: Mogi-Guaçu River, associated with the aquatic macrophyte *Scirpus cubensis* (Correia & Trivinho-Strixino 1998, Trivinho-Strixino et al. 2000). Américo Brasiliense: Anhumas Stream Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005, Suriani et al. 2007). Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007).

***Slavina isochaeta* Černosvitov, 1939**

**Records: ecological remarks**

Luiz Antonio: Mogi-Guaçu River, sediment (Alves & Strixino 2003).

***Slavina sawayai* Marcus, 1944**

**Records: ecological remarks**

Águas de São Pedro: Piracicaba River Basin, Araquá River, sediment (Marcus 1944).

***Stylaria lacustris* (Linnaeus, 1767)**

**Records: ecological remarks**

Brotas and Américo Brasiliense: Lagoa Dourada and Anhumas Stream Dams, associated with aquatic macrophytes (Alves & Gorni 2007).

***Tectidrilus gabriellae* Du Bois-Reymond Marcus, 1950**

*Peloscolex gabriellae*, Du Bois-Reymond Marcus 1950: 1.

**Records:**

São Sebastião (Du Bois-Reymond Marcus 1950).

***Tubifex tubifex tubifex* (O. F. Müller, 1774)**

*Tubifex (Tubifex) tubifex*, Marcus 1942: 198-200.

*Tubifex tubifex*, Alves & Strixino 2000: 177; Alves et al. 2006: 434.

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1942). Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000). São Carlos: Monjolinho River, sediment (Alves et al. 2006).

**Narapidae**

***Narapa bonettoi* Righi & Varela, 1983**

**Records: ecological remarks**

São Carlos: Gouveia Stream, sediment (Alves et al. 2006).

**OPISTOCYSTIDAE**

***Opistocysta funiculus* Cordero, 1948**

*Opistocysta flagellum*, Marcus 1944: 69-70.

**Records: ecological remarks**

São Paulo: Tietê River, sediment (Marcus 1944). Luiz Antônio: Mogi-Guaçu River, sediment (Alves & Strixino 2000, Alves & Strixino 2003). Américo Brasiliense: Anhumas Stream

Dam, sediment (Corbi & Trivinho-Strixino 2002). Salesópolis and Bariri: Tietê River, Ponte Nova and Bariri Dams, sediment (Pamplin et al. 2005). Americana: Atibaia River, Salto Grande Dam, sediment (Dornfeld et al. 2006), and in Americana Dam (Pamplin et al. 2006). Barra Bonita: Tietê River, Barra Bonita Reservoir, sediment; Ibitinga: Tietê River, Ibitinga Reservoir, sediment; Buritama: Tietê River, Nova Avanhandava Reservoir, sediment; Pereira Barreto: Tietê River, Três Irmãos Reservoir, sediment (Suriani et al. 2007).

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