

## SCIENTIFIC NOTE

## New Records of the Black Fly Fauna (Diptera: Simuliidae) in Two Rivers of the Western Amazonia, Brazil

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## Novos Registros da Simuliofauna (Diptera: Simuliidae) em Dois Rios da Amazônia Ocidental, Brasil

**RESUMO** - O objetivo deste trabalho foi verificar a presença e composição de simulídeos nos rios Antimari e Acre, localizados no extremo oeste da Amazônia Ocidental. Foram levantados 19 pontos de coleta ao longo dos rios Antimari e Acre, onde foram coletadas 133 larvas e 197 pupas, totalizando 330 imaturos de simulídeos. As seguintes espécies foram encontradas pela primeira vez na região: *Simulium (Psaroniocompsa) amazonicum* Goeldi, *Simulium (Psaroniocompsa) oyapockense* Floch & Abonnenc, *Simulium (Psaroniocompsa) quadrifidum* Lutz, *Simulium (Psilopelmia) lutzianum* Pinto, *Simulium (Psilopelmia) perflavum* Roubaud e *Simulium (Notolepria) exiguum* Roubaud. Os resultados sugerem que *S. amazonicum*, *S. oyapockense* e *S. quadrifidum* têm distribuição geográfica mais ampla e são mais frequentes nessa região.

**PALAVRAS-CHAVE:** *Simulium*, Acre, Amazonas, rio Antimari, rio Acre

**ABSTRACT** - Our goal was to verify the presence and the composition of black fly species in the Antimari and Acre rivers, located in the end of Western Amazonia, where this entomological inquiry was accomplished. Along the Antimari and Acre rivers, 19 localities were studied and 133 larvae and 197 pupae were collected, totalizing 330 black fly immatures. The following species are recorded for the first time in this area: *Simulium (Psaroniocompsa) amazonicum* Goeldi, *Simulium (Psaroniocompsa) oyapockense* Floch & Abonnenc, *Simulium (Psaroniocompsa) quadrifidum* Lutz, *Simulium (Psilopelmia) lutzianum* Pinto, *Simulium (Psilopelmia) perflavum* Roubaud and *Simulium (Notolepria) exiguum* Roubaud. Our data suggest that *S. amazonicum*, *S. oyapockense* and *S. quadrifidum* have a wide geographical distribution as well as population density.

**KEY WORDS:** *Simulium*, Acre, Amazonas, Antimari river, Acre river

The diversity of black fly species can be influenced by different environmental factors, as water flow, nutrient availability, the substratum readiness for fixation of immatures (Corkum & Currie 1987) and by anthropization. According to Moreira *et al.* (1994), the sources of pollution can also influence the species composition of lotic systems.

In the Brazilian Amazonia seven subgenera of *Simulium* are found: *Simulium (Chirostilbia)* Enderlein, represented by two groups of species; *Simulium (Hemicnetha)* Enderlein, with four groups of species; *Simulium (Inaequalium)* Coscarón and Wygodzinsky, represented by two groups of species; *Simulium (Notolepria)* Enderlin, with one group of species; *Simulium (Psaroniocompsa)* Enderlein, represented by six groups of species; *Simulium (Psilopelmia)* Enderlein, with five groups of species and *Simulium (Trichodagmia)* Enderlein, represented by one group of species (Adler & Crosskey 2008).

Despite the several taxonomic studies on the fauna from the rivers of the Brazilian Amazonia area, taxonomic and bionomics registrations for the family Simuliidae in Acre and Amazonas States are still scarce. Due to the importance of this family in the filarial transmission in Brazil and the lack of information on local species, studies have been addressing the black fly species distribution in the Antimari and Acre rivers, located in the Amazonia hydrographic basin, in the States of Acre and Amazonas.

The area selected for this study is located along the Antimari and Acre rivers, as well as in the tributary streams of these rivers, located in Acre and Amazonas States, in the Amazonia hydrographic basin (Fig 1). The Antimari river is a subsidiary of the Acre river and it reaches 66,168 hectares in the Center-East of the Acre State, in Bujari district. The Acre river is the main river of the drainage net of Rio Branco district and its drainage-basin area is of

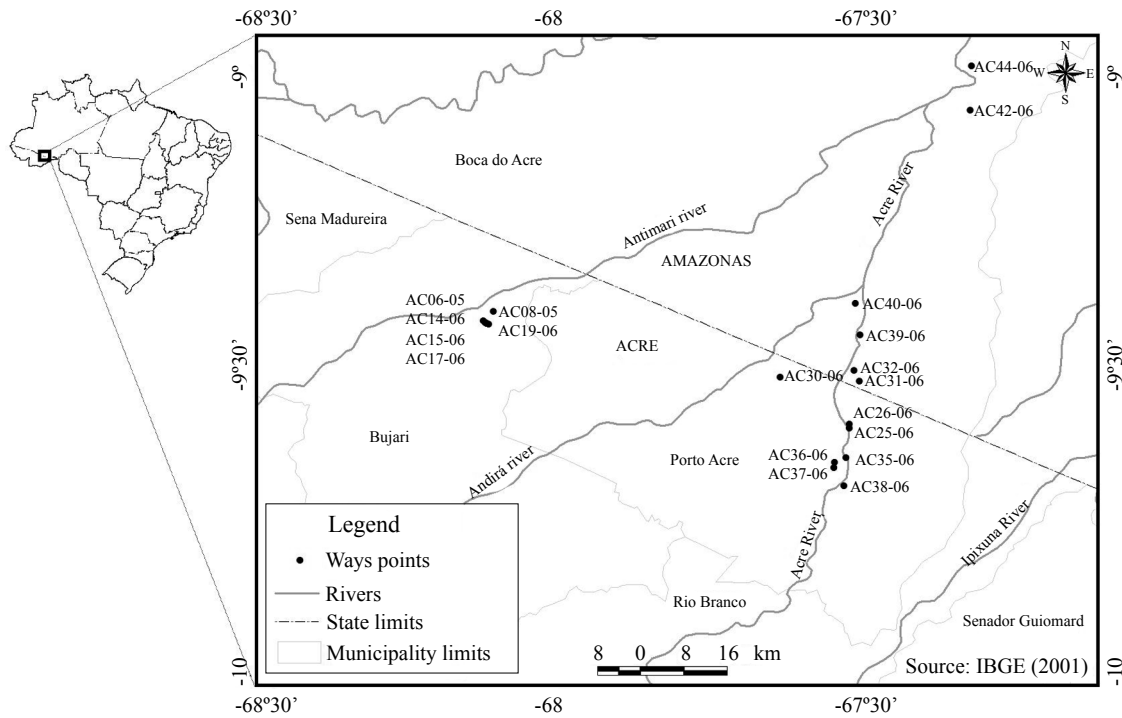


Fig 1 Area selected for this study along the Antimari and Acre rivers, Acre and Amazonas States, Brazil.

approximately 609.15 km<sup>2</sup> (ZEE-Acre 2000).

Black fly immatures sampling was conducted in July/2006 (dry season in the area) for a period of 15 days in natural substrate found at 19 selected point-nurseries in several courses of water, where temperature, water pH, geographical coordinates and altitude were recorded (Tables 1, 2).

The key of Adler & Crosskey (2008) was used for black fly species identification.

From 133 larvae and 197 pupae collected, 39 adults emerged in 23 females and 16 males, totalizing 330 immatures

identified as: *Simulium (Psaroniocompsa) amazonicum* Goeldi, *Simulium (Psaroniocompsa) oyapockense* Floch & Abonnenc, *Simulium (Psaroniocompsa) quadrifidum* Lutz, *Simulium (Psilopelmia) lutzianum* Pinto, *Simulium (Psilopelmia) perflavum* Roubaud and *Simulium (Notolepria) exiguum* Roubaud (Tables 1, 2). According to our data, from the six species identified, *S. amazonicum*, *S. oyapockense* and *S. quadrifidum* were found to have a wider distribution and higher density, as they were collected in both rivers.

Table 1 Occurrence of *Simulium* species in Antimari river, Acre State, Brazil.

Species	Locality	Coordinates	Altitude (m)	T (°C)	pH
<i>S. amazonicum</i> <i>S. oyapockense</i> <i>S. quadrifidum</i>	AC 19-06 Colocação Pé da Serra	S09°24'37.1" W068°07'25.0"	125	24	5.0
<i>S. amazonicum</i>	AC 17-06 Mapinguari	S09°24'33.8" W068°07'36.9"	126	24	5.0
<i>S. amazonicum</i> <i>S. oyapockense</i>	AC 15-06 Colocação Boa Vista	S09°24'32.0" W068°07'36.7"	127	24	5.0
<i>S. amazonicum</i> <i>S. oyapockense</i> <i>S. lutzianum</i>	AC 14-06 Colocação Boa Vista	S09°24'32.9" W068°07'44.9"	129	24	5.0
<i>S. amazonicum</i>	AC 06-05 Colocação Barro Alto	S09°24'17.6" W068°07'56.3"	140	26	5.0
<i>S. amazonicum</i>	AC 08-05 Colocação Limoeiro	S09°23'21.6" W068°06'55.1"	137	26	5.0

Table 2 Occurrence of *Simulium* species in Acre river, Acre and Amazonas States, Brazil.

State	Species	Locality	Coordinates	Altitude m	T °C	pH
Acre	<i>S. quadrifidum</i>	AC 38-06 Município de Porto Acre	S09°40'43.2" W067°32'06.5"	99	28	6.0
Acre	<i>S. oyapockense</i> <i>S. quadrifidum</i> <i>S. oyapockense</i> <i>S. perflavum</i>	AC 37-06 Município de Porto Acre	S09°38'54.9" W067°33'06.5"	110	28	5.0
Acre	<i>S. quadrifidum</i>	AC 36-06 Município de Porto Acre	S09°38'31.5" W067°33'09.7"	111	28	6.0
Acre	<i>S. amazonicum</i> <i>S. quadrifidum</i>	AC 35-06 Município de Porto Acre	S09°37'53.6" W067°31'53.3"	101	28	6.0
Acre	<i>S. quadrifidum</i>	AC 25-06 Município de Porto Acre	S09°34'59.5" W067°31'34.4"	102	24	5.0
Acre	<i>S. oyapockense</i> <i>S. quadrifidum</i> <i>S. oyapockense</i> <i>S. perflavum</i>	AC 26-06 Município de Porto Acre	S09°34'34.9" W067°31'36.6"	107	24	5.0
Amazonas	<i>S. oyapockense</i>	AC 30-06 Município de Porto Acre	S09°30'18.7" W067°30'36.4"	107	24	5.0
Amazonas	<i>S. quadrifidum</i>	AC 31-06 Município de Boca do Acre	S09°29'53.5" W067°30'25.6"	107	24	5.0
Amazonas	<i>S. amazonicum</i> <i>S. oyapockense</i> <i>S. lutzianum</i> <i>S. exiguum</i>	AC 32-06 Município de Boca do Acre	S09°29'27.1" W067°31'07.7"	109	24	5.0
Amazonas	<i>S. amazonicum</i> <i>S. oyapockense</i> <i>S. quadrifidum</i>	AC 39-06 Município de Boca do Acre	S09°25'42.5" W067°30'30.0"	99	25	5.0
Amazonas	<i>S. amazonicum</i> <i>S. quadrifidum</i> <i>S. perflavum</i>	AC 40-06 Município de Boca do Acre	S09°22'35.3" W067°31'00.6"	113	28	5.0
Amazonas	<i>S. quadrifidum</i>	AC 42-06 Município de Boca do Acre	S09°03'23.9" W067°19'35.6"	98	28	6.0
Amazonas	<i>S. quadrifidum</i>	AC 44-06 Município de Boca do Acre	S08°59'03.6" W067°19'30.7"	70	30	6.0

*Simulium quadrifidum* was collected in more than 50% of the samples, in the Antimari and Acre River, what corroborates Shelley *et al* (1997) report that this species is commonly found in the Brazilian Amazonia. Such species erroneously assumed epidemic importance when it was mistaken by *Simulium amazonicum* (Cerqueira & Nunes de Mello), which is the vector of the filaria *Mansonella ozzardi*. However, all these species can be successfully identified using adults reared from collected pharate pupae, and basing the identification on the pupae exuviae and the emerged adults (Shelley *et al.* 1982). *Simulium amazonicum* was also identified in Antimari and Acre rivers.

*Simulium oyapockense*, which is similar to *Simulium roraimense* Nunes de Melo and is anthrophilic, has been previously registered in Pará, Roraima, Rondônia, Amapá

and Amazonas States (Shelley *et al* 1997). This species was collected in both rivers Antimari and Acre during this study. *Simulium exiguum* is also a vector and was registered only in the Acre river, Amazonas. In Brazil, this species is mainly zoophilic, but has been anthrophilic in Distrito Federal, Amazonas, Goiás, Mato Grosso, Roraima and São Paulo States (Shelley *et al* 1997).

*Simulium lutzianum* was only collected from the Auaris river in Brazil in one occasion and was found at Parima on the Venezuelan side of the onchocerciasis focus. It has a wide distribution outside the onchocerciasis focus (Shelley *et al* 1997). According to Adley & Crosskey (2008), this species was reported in Brazil in Goiás, Roraima, Paraná Santa Catarina and Rio Grande do Sul States. It was found in Antimari and Acre rivers, corroborating the reports of its

occurrence in the Amazonian area.

*Simulium perflavum* was found in Acre river, in three different collection sites, presenting zoophilic habit and wide distribution and was previously recorded in Amapá, Amazonas, Pará, Pernambuco, Rio Grande do Sul, Bahia, Goiás, Mato Grosso, São Paulo, Espírito Santo, Minas Gerais, Rio de Janeiro and Santa Catarina States (Crosskey & Howard 2004).

These new records of seven black fly species leads to the detection of a diversity of anthrophilic and zoophilic species in the Antimari and Acre rivers, as well as the presence of species vectors of mansonelliasis and onchocerciasis in endemic areas.

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