

## ON THE GEOGRAPHIC DISTRIBUTION OF PARABROTEAS SARSI (MRÁZEK, 1901) (COPEPODA, CALANOIDA).

## SOBRE LA DISTRIBUCIÓN GEOGRÁFICA DE PARABROTEAS SARSI (MRÁZEK, 1901) (COPEPODA, CALANOIDA).

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*Parabroteas sarsi* (Mrázek, 1901) (Copepoda, Calanoida) is a typical species from Southern South American and Sub-Antarctic water bodies (45-68° S, Ruiz & Bahamonde 1989, Bayly 1992), this species can be found in shallow ponds and few large and deep lakes (Menu-Marque & Marinone 1986, Janiec 1993, Modenutti *et al.* 1998, Pugh *et al.* 2002, De los Ríos 2003<sup>1</sup>, Reissig *et al.* 2004, Dartnall 2005, De los Ríos & Contreras 2005, Villalobos 2006, Soto & De los Ríos 2006, De los Ríos & Soto 2007). This species has a large body (TL: 5.0- 7.0 mm), and it is the biggest free living copepod (Araya & Zúñiga 1985, Villalobos 2006), and it is an active zooplanktivorous predator (Hannsson & Tranvik 1997, Menu-Marque & Balseiro 2000, Hannsson & Tranvik 2003), and it predares on juvenile of cladocerans and copepods (Diéguez & Balseiro 1998, Modenutti *et al.* 1998, Vega 1999). The aim of the present note is to study the spatial distribution of the species *P. sarsi* for establishing distribution its in Southern South America and Sub-Antarctic islands.

### TAXONOMIC STATUS

Phylum: Arthropoda  
Superclass: Crustacea  
Class: Maxillopoda  
Subclass: Copepoda  
Order: Calanoida  
Family: Centropagidae Sars, 1903.

*Parabroteas sarsi* Mrázek, 1901 (= *Parabroteas michaelseni* Mrázek, 1901; *Limnocalanus sarsi* Daday, 1902; *Gigantella sarsi* Ekman, 1900).

### SPACIAL DISTRIBUTION

### ARGENTINA

Fantasma lagoon (41°07' S; 71° 27' W) (Balseiro & Vega 1994), Juncos lagoon (40°04' S 71° 00' W) (Menu-Marque & Balseiro 2000), Rivadavia Lake (42° 34'S, 71°40' W) (Modenutti *et al.* 2003), Colhue-Huapi Reservoir (45°30' S; 68° 46' W) (Menu-Marque & Marinone 1986), Argentino Lake (50°15' 72° 33' W) (Daday 1902), Cabo Vírgenes ponds (52°19' S; 68° 21' W), Sarmiento ponds (45° 35' S; 69° 04' W), Estancia María Behety (57° 48' S, 67°53' W), Río Chico ponds (50°02' S, 68°

<sup>1</sup> De los Ríos, P. 2003. Efectos de las disponibilidades de recursos energéticos, estructurales y de protección sobre la distribución y abundancia de copépodos y cladóceros zooplanctónicos lacustres chilenos. Tesis de Doctorado, Universidad Austral de Chile, Facultad de Ciencias, Valdivia, Chile. 107 pp.

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32° W), Tres Lagos ponds (49° 36' S, 71°30' W) (Adamowicz *et al.* 2007).

## CHILE

Los Palos lagoon (45° 19'S, 72° 42'W), Riesco lake (45°46'S, 72°20'W) (Villalobos 1999<sup>2</sup>), ponds at Balmaceda I, II y III (45°53'S, 71°40'W) (De los Ríos 2008), Chiguay lagoon (45°56' S; 71° 50' W) and Elizalde lake (45° 45' S; 72° 25' W) (Araya & Zúñiga 1985). Permanent ponds: Redonda (51°01'S, 72°52'W), Larga (51°01'S, 72°52'W), Cisnes (51°01'S, 72°52'W) (Soto & De los Ríos 2006), Guanaco (51°01'S, 72°50'W), Don Alvaro (51°01'S, 72°52'W) (De los Ríos 2003<sup>2</sup>). Ephemeral ponds: Vega del Toro (51°07'S, 71°40'W), Kon Aikén (52°50'S, 71°10'W) (De los Ríos 2005a); Kon Aikén (I-VI) 52°50'S, 70°50'W), Monte and de los Patos Bravos lagoons (53°09' S; 70° 57' W) (Mrázek 1901), Porvenir ponds (53°17'S, 70°19'W) (De los Ríos *et al.* 2008).

## ANTARCTIC AND SUB-ANTARCTIC ISLANDS

Falkland Islands (51°38' S; 57°52' W) (Ringuelet 1956), South Georgia Islands (54°10' S; 36° 41' W) (Hannson *et al.* 1996), South Orkney Islands (60°43' S; 45°38' W), Graham land (63°26' S; 57°01' W), Palmer land (68° 12' S, 67° 00' W) (Pugh *et al.* 2002), King George Island (62°01' S; 58° 04' W) (Campos *et al.* 1978).

In according to the present results, the species *P. sarsi* is located between 41-68° S, nevertheless, the literature mentioned that this species can be found at 38° S in Neuquen Province, Argentina (Ringuelet 1956) and Antarctic continent (Janiec 1993); nevertheless unfortunately both references do not specify details about the records of this species. About the distribution in Chilean continent, it is possible found this species at south of 45° S (De los Ríos 2008). In fact this species was not recorded in northern Patagonia (38-41° S), where it is possible found shallow ponds, small lakes, and large and deep lakes mainly in Araucanía region similar to water bodies of Torres del Paine National Park

(39° S, De los Ríos, pers. obs.). This result does not agree with other references that described the presence of this species at northern Patagonia (41-45° S, Villalobos 2006) and central Chile (Brehm 1936). In fact, Brehm (1936) mentioned the record of this species in Verde lagoon (32° S; Valparaíso region), but in the text, it is mentioned as "ostracod" and this generates confusion and by this reason it is not possible to find this species at central Chilean inland waters.

This species, can coexist with other similar species reported for southern South America, such as *B. gracilipes*, *B. michaelensi* and *B. poopensis* and species recorded for southern South America, Antarctica and Sub-Antarctic islands such as *B. brasiliensis*, *B. brevicaudata*, and *B. poppei* (Menu-Marque *et al.* 2000, De los Ríos *et al.* 2008). The habitats of *P. sarsi* are mainly shallow permanent and ephemeral ponds with a low and moderate conductivity (De los Ríos 2005a, De los Ríos & Contreras 2005, Soto & De los Ríos 2006). Also, this species can be found in depth layers of few large and deep lakes mainly at 45° S (Modenutti *et al.* 2003, Reissig *et al.* 2004, De los Ríos & Soto 2007). Also, the habitats of *P. sarsi* are exposed to high levels of natural ultraviolet radiation due to ozone depletion (Morris *et al.* 1995, Marinone *et al.* 2006), and this species has photoprotective strategies such as synthesis of photoprotective substances (Tartarotti *et al.* 2004), that provide protection against damage of ultraviolet radiation (De los Ríos 2005b, 2007).

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<sup>2</sup> Villalobos, L. 1999. Determinación de la capacidad de carga y balance de fósforo y nitrógeno de los lagos Riesco, Los Palos y Laguna Escondida en la XI región. Informe Técnico, Fondo de Investigación Pesquera, Chile, FIP-IT/97-39.

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