Lundiana 5(2):151-153, **2004**

ISSN 1676-6180

SHORT COMMUNICATION

The exotic rotifer *Kellicottia bostoniensis* (Rousselet, 1908) (Rotifera: Brachionidae) in the zooplankton community in a tropical reservoir

José F. Bezerra-Neto[1], Laura R. Aguila[1], Giovanni G. Landa[1] & Ricardo M. Pinto-Coelho[2]

[1] Programa de Pós-Graduação em Ecologia, Conservação e Manejo da Vida Silvestre, Instituto de Ciências Biológicas, UFMG. CP 486, 31270-901, Belo Horizonte - MG, Brasil. E-mail: joseneto@icb.ufmg.br. [2] Laboratório de Gestão de Reservatórios Tropicais, Departamento de Biologia Geral, Instituto de Ciências Biológicas, UFMG. E-mail: rmpc@icb.ufmg.br

The rotifer *Kellicottia bostoniensis* is a species commonly encountered in North America (Edmondson, 1959), being found for the first time in samples collected for Charles F. Rousselet, in an ornamental lake in the city of Boston, in August of 1907. This species was initially described as *Notholca bostoniensis* (Rousselet, 1908) and in 1938 it received the name *Kellicottia bostoniensis* by Ahstron (Arnemo et al., 1968). The distribution of *K. bostoniensis* was confined to that region until its appearance in Europe, reported by Carlin in Sweden in 1943 (Pejler, 1998). Since then, there were records of this rotifer in Swedish lakes (Arnemo et al., 1968), as well as in the Netherlands (Leentvaar, 1961), Finland (Eloranta, 1988) and France (Balvay, 1994).

In Neotropical regions, the only species recorded for this genus was *Kellicottia longispina* (Koste & De Paggi, 1982; De Paggi & Koste, 1995) and only recently the occurrence of *K. bostoniensis* was reported in Argentina (De Paggi, 2002). In 1997, the occurrence of *K. bostoniensis* was noticed in the Segredo Reservoir, a mesotrophic reservoir in Paraná state, Southern Brazil (Lopes et al., 1997).

In southeastern Brazil, *K. bostoniensis* (Fig. 1) was found in an oligotrophic reservoir, Furnas (20º40'S – 46º19'W), in the basin of the Grande river (Landa et al., 2002), and also in a eutrophic reservoir, Lagoa do Nado (19º55'S – 43º56'W), in the city of Belo Horizonte (Bezerra-Neto, 2001), both in Minas Gerais State.

The Lagoa do Nado reservoir (Zmax = 6.5m) was sampled monthly from October 1999 to March 2000 (diurnal and nocturnal samplings) using a 17 l Patalas trap. During this period the water column was stratified with intense anoxia in the hypolimnion (< 1mg.l^{-1}) and temperatures were above 20º C. The rotifer *K. bostoniensis* was found during the study period to be most abundant in November (3.40 x 10^{6}ind.m^{-2}) (Fig. 2), with the highest concentrations in the hypolimnion (Bezerra-Neto & Pinto-Coelho, 2002) (Fig. 3). The ability of *K. bostoniensis* to tolerate low oxygen levels has been reported by Stemberger & Gilbert (1987) in temperate lakes.

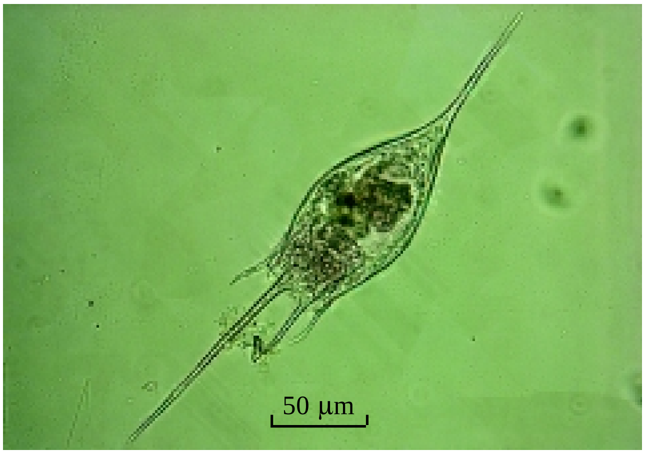

Figure 1 - Photomicrography of *Kellicottia bostoniensis* from the Furnas Reservoir, collected in February 2000.

The exotic *K. bostoniensis* has already a noticeable role in the rotifer community of Lagoa do Nado reservoir. The highest densities of most rotifers occur at the end of dry season (September-October) or at the beggining of the rainy period (November/December). At this time, *Kellicottia bostoniensis* can reach nearly of the 40% total rotifer density (Fig. 2).

The Furnas reservoir comprises an area of 1440 km^2 and reaches the maximum depth (90m) by the dam wall. In August and October 1999 and in March and July 2000 three extensive samplings were done along a trophic gradient in 12 different locations of the reservoir distributed along the central axis of the dam and in one of its main tributaries, the Sapucaí River axis. The samplings were taken through vertical tow, with a 68 µm cylindrical-conical net. *K. bostoniensis* was observed in the whole sampled area, and the higher densities were observed in October and March (rainy period), in the meso and eutrophic areas, with maximum abundance of 9.79 x 10^3 ind. m^{-3} (Landa et al., 2002).

Received: 16.IV.2004
Accepted: 20.VIII.2004
Distributed: 31-XII-2004

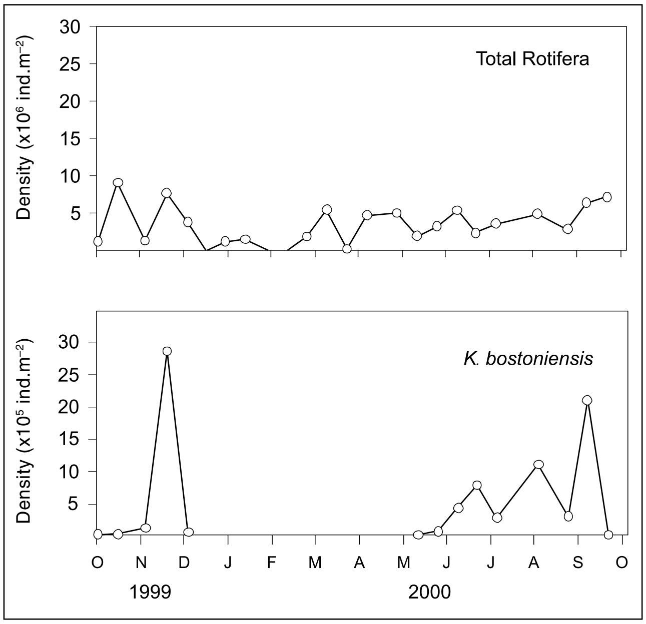

Figure 2 - Annual cycle of densities of total rotifers (top) and the rotifer *Kellicottia bostoniensis* (bottom) in Nado reservoir. Note the different vertical scales in the panels.

These reservoirs exhibited very different morphometrical characteristics and limnological conditions, especially regarding trophy indicators. While the Lagoa do Nado reservoir is a small eutrophic urban reservoir, Furnas is a large reservoir with both oligo and mesotrophic areas. The occurrence of *K. bostoniensis* in these reservoirs possibly reflects its high adaptability to a great variety of tropical environments.

The biometric relationship among *K. bostoniensis* found in the Lagoa do Nado and Furnas reservoirs shows smaller anterior and posterior spines in comparision to the data of Arnemo *et al*. (1968), Koste (1978) and Balvay (1994). Individuals collected in Furnas reservoir were significantly larger than those collected in the Lagoa do Nado reservoir (Tab. 1). In general, the data obtained in the present study indicate that the organisms found in southeastern Brazil are smaller than those found in temperate regions.

According to Stemberger & Gilbert (1987), the investment by rotifers in big spines in temperate regions is explained by the need to minimize the sinking rate and predation, especially by *Asplanchna*. In tropical regions, the investment in long spines does not seem to be expressive, probably because it could be a recent introduction and the organisms would still not have a preferential predator.

The immigration of *K. bostoniensis* to the Neotropical region may have been associated to the transport of resistance eggs by migratory birds (Lopes et al., 1997) and transport of

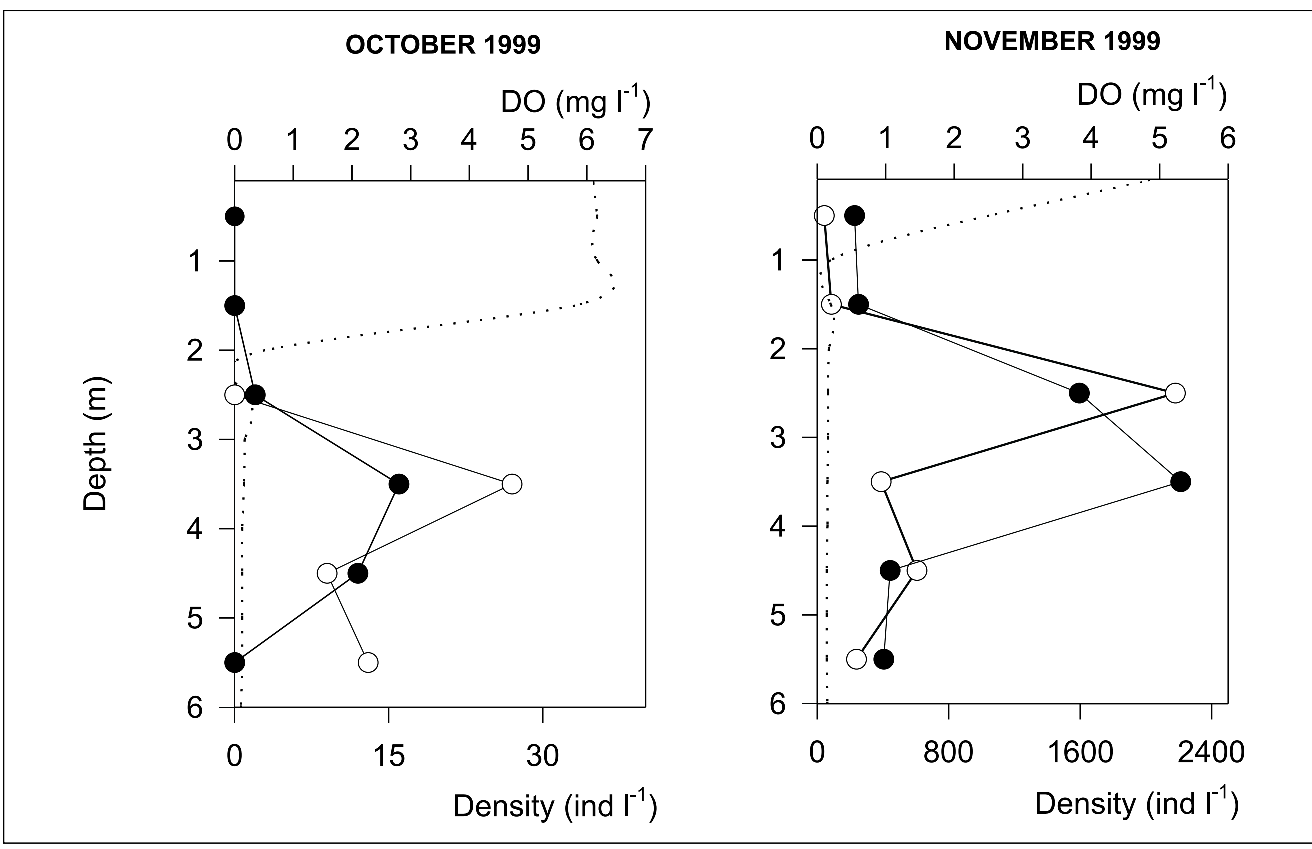

Figure 3 - Depth profiles of abundances of *Kellicottia bostoniensis* during day (open circles) and night samplings (closed circles) during the months of October and November 1999. The dissolved oxygen vertical profile is shown in dashed line.

Table 1 - Allometric variation of *Kellicottia bostoniensis* collected in the Lagoa do Nado reservoir and Furnas reservoir and its comparison to published data. Values are expressed in micrometers (µm) and are represented as mean (SD)

Localities	N. ind.	Total length	Anterior spine	Posterior spine	Lorica length
Furnas reservoir	55	306 (21)	115 (11)	90 (12)	101 (5)
Lagoa do Nado reservoir	65	285 (16)	108 (10)	74 (10)	105 (6)
Lake Ô.Vattern					
(Arnemo et al., 1968)	100	380	150	130	–
(Koste, 1978)	–	360-380	136-150	118-130	–
Lake Devesset (Balvay , 1994)	51	374 (15)	139 (8)	123 (8)	109 (6)

organisms through ballast water from big ships (Reid & Pinto-Coelho, 1994); another possibility was transport through wind or rain, although, according to Jenkins & Underwood (1998), this would be the least probable factor.

Acknowledgments

The authors thank the Administration of the City of Belo Horizonte and Furnas Centrais Elétricas for logistic support in the field; to CNPq and AECI for fellowships to J.F.B.N. and L.R.A., respectively. We are also grateful to Dr. Susana José de Paggi (INALI – Argentina) for her assistance in species identification.

References

Arnemo, R.; Berzins, B.; Gronberg, B. & Mellgren, I. 1968. The dispersal in Swedish waters of *Kellicottia bostoniensis* (Rousselet) (Rotatoria). **Oikos, 19**: 351-358.

Balvay, G. 1994. First record of the rotifer *Kellicottia bostoniensis* (Rousselet, 1908) in France. **Journal of Plankton Research, 16**: 1071-1074.

Bezerra-Neto, J. F. 2001. **A influência da larva de *Chaoborus* (Insecta: Diptera) na distribuição espacial da comunidade zooplanctônica na Lagoa do Nado, Belo Horizonte – MG.** Belo Horizonte, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Dissertação de Mestrado.

Bezerra-Neto, J. F. & Pinto-Coelho, R. M. 2002. A influência da larva de *Chaoborus brasiliensis* (Insecta: Diptera) na distribuição vertical da comunidade zooplanctônica da Lagoa do Nado, Belo Horizonte – MG. **Acta Scientiarum, 24**: 337-344.

De Paggi, S. J. 1978. Observaciones sobre algunos rotiferos nuevos para la fauna Argentina. **Neotropica, 24**: 99-104.

De Paggi, S. J. 2002. New Data on the Distribution of *Kellicottia bostoniensis* (Rousselet, 1908) (Rotifera: Monogononta: Brachionidae): Its Presence in Argentina. **Zoologischer Anzeiger, 241**: 363-368.

De Paggi, S. J. & Koste, W. 1995. Additions to the checklist of rotifers of the Superorder Monogononta recorded from Neotropis. **Internationale Revue Der Gesamten Hydrobiologie, 80**: 133-140.

Edmondson , W. T. 1959. **Freshwater Biology**. New York, John Wiley, 597 pp.

Eloranta, P. 1988. *Kellicottia-bostoniensis* (Rousselet), a planktonic rotifers species new to Finland. **Annales Zoologici Fennici, 25**: 249-252.

Jenkins, D. G. & Underwood, M. O. 1998. Zooplankton may not disperse readily in wind, rain, or waterfowl. **Hydrobiologia, 387/388**: 15-21.

Koste, W. & De Paggi, S. J. 1982. Rotifera of the Superorder Monogononta recorded from Neotropis. **Gewasser und Abwasser, 68/69**: 71-102.

Landa, G. G.; Del Aguila, L. R. & Pinto-Coelho, R. M. 2002. Distribuição espacial e temporal de *Kellicottia bostoniensis* (Rousselet, 1908) (Rotifera) em um grande reservatório tropical (reservatório de Furnas), Estado de Minas Gerais, Brasil. **Acta Scientiarum, 24**: 313-319.

Leentvaar, P. 1961. Quelques rotateurs rares observés em Hollande. **Hydrobiologia, 18**: 245-251.

Lopes, R. M. & Lansac-Tôha, F. A. 1997. Comunidade zooplanctônica do reservatório de Segredo. In: Agostinho, A. A. & Gomes, L. C. (Ed.) **Reservatório de Segredo: Bases Ecológicas para o Manejo.** Maringá, Editora da Universidade Estadual do Maringá, pp. 39-60.

Koste, W. 1978. **Rotatoria. Die Radertiere Mitteleuropas Begrundet von Max Voigt. Monogonta.** Berlin, Stuttgart, Gebruder Borntraeger, Tome 1, pp. 1-673; Tome 2, pp.1-471.

Pejler, B. 1998. History of rotifer research in nothern Europe. **Hydrobiologia**, **387/388**: 1-8.

Reid, J. W. & Pinto-Coelho, R. M. 1994. An Afro-Asian continental copepod, *Mesocyclops ogunnus* found in Brazil; with a new key to the species of *Mesocyclops* in South America and a review of international introductions of copepods. **Limnologica**, **28**: 359-368.

Rousselet, C. F. 1908. Note on the rotatorian fauna of Boston, with description of *Notholca bostoniensis*, s. n. **Journal of Quekett Microscopy, 10**: 335-340.

Stemberger, R. S. & Gilbert, J. J. 1987. Defenses of planktonic rotifers against predators. In: W. C. Kerfoot & Sih, A. (Ed.) **Predation: Direct and Indirect Impacts on Aquatic Communities**. Hannover, University Press of New England, pp. 227-2.