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Description of five new species of the diatom genus *Luticola* (Bacillariophyta, Diadesmidaceae) found in lakes of James Ross Island (Maritime Antarctic Region)

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Abstract

During a survey of the non-marine diatom flora from lakes on James Ross Island (Maritime Antarctic Region), five new *Luticola* species have been recorded: *Luticola desmetii*, *L. doliiformis*, *L. evkae*, *L. permuticopsis* and *L. tomsui*. Detailed morphology descriptions of these taxa are given based on both light (LM) and scanning electron microscopy (SEM). The morphological features of each taxon have been compared with similar taxa and notes on the ecology of the species have been added.

Key words: Bacillariophyta, diatoms, *Luticola*, new species, morphology, ecology

Introduction

The genus *Luticola* D.G.Mann in Round *et al.* (1990) is a common constituent of the terrestrial ecosystems in the Antarctic Region. In recent years, a large number of new *Luticola* taxa have been described from this region, making the genus one of the most species-rich in the area. At present, 26 different taxa are confirmed from the Antarctic Region, while six others have been reported; their presence needs to be verified (Esposito *et al.* 2008, Kopalová *et al.* 2009, Van de Vijver *et al.* 2002a, 2002b, 2006, 2011, Van de Vijver & Mataloni 2008). The genus is characterized by uniseriate striae composed of rounded to transapically elongate areolae covered internally by perforated hymenes, an isolated, usually distinct stigma in the central area, a longitudinal canal positioned within the valve wall and a simple, filiform raphe with variable raphe endings (Round *et al.* 1990).

In 2007 only 63 taxa were reported (Fourtanier & Kociolek 2007). This low number is most probably the result of lumping morphologically comparable taxa into catch-all species such as *Luticola muticopsis* (Van Heurck 1909: 12) D.G.Mann (Round *et al.* 1990: 671) or *L. mutica* (Kützing 1844: 93) D.G.Mann (Round *et al.* 1990: 671) by force-fitting and species drift. Some authors promote the use of a more narrow species concept based on morphological and morphometric differences, a practice that clarifies the diversity of the genus (Van de Vijver & Mataloni 2008, Pavlov *et al.* 2009, Van de Vijver *et al.* 2011).

Most *Luticola* taxa show a preference for terrestrial environments such as soils and damp moss habitats (Van de Vijver *et al.* 2002a, Lowe *et al.* 2007). The few studies focussed on terrestrial diatoms is another element that may have resulted in the underestimation of the species richness of the genus.

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