



## New *Sericosura* (Pycnogonida: Ammotheidae) from deep-sea hydrothermal vents in the Southern Ocean

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### Abstract

Three new species of *Sericosura* (Pycnogonida: Ammotheidae) are described from recently discovered hydrothermal vents in the East Scotia Ridge, Southern Ocean: *Sericosura bamberi* sp. nov., *S. dimorpha* sp. nov. and *S. curva* sp. nov. The eleven species known to date in the genus *Sericosura* are all inhabitants of chemosynthetic environments in different oceans around the world.

Morphology and preliminary DNA data from the COI locus suggest the East Scotia Ridge pycnogonids have relatively close evolutionary affinities with species known from the East Pacific Rise and the Mid-Atlantic Ridge. This finding highlights the importance of *Sericosura* as a characteristic taxon of hydrothermal vents and the great potential of this genus for global scale ecological and evolutionary studies of hydrothermal vents fauna.

The use of pycnogonid DNA data combined with recent models explaining biogeographic provinces along the mid-ocean ridge system should prove extremely useful to understanding the patterns of diversification of endemic fauna from chemosynthetic environments and from the deep-sea in general.

**Key words:** Antarctica, sea spiders, East Scotia Ridge, chemosynthetic ecosystems, COI

### Introduction

ChEsSo (Chemosynthetic ecosystems in the Southern Ocean) was a multidisciplinary UK research consortium aiming to discover and investigate chemosynthetic habitats south of the Polar Front in the Southern Ocean. The consortium aimed at not only characterising the fauna present at chemosynthetic ecosystems in this region, but also the physical environment of the vent or seep sites and the ecology of the communities present (Rogers 2010; Rogers *et al.* 2012).

At least 378 pycnogonids were collected during the second ChEsSo expedition on RRS *James Cook* cruise JC42 in 2010 from three collecting locations (ridge segments E2, E9 and Kemp Caldera) in the East Scotia Ridge (Fig. 1). Three new species in the genus *Sericosura* Fry & Hedgpeth, 1969 (Ammotheidae) were discovered in the samples. The genus *Sericosura* so far includes eleven species, all apparently obligate inhabitants of hydrothermal vents or other chemosynthetic environments (Bamber 2009). The genus has been recorded from the Pacific, Atlantic and Antarctic at depths between 22 and 3660 m.

Based on morphological and molecular analysis (Arango & Wheeler 2007), the genus *Sericosura* is closely related to *Ammothea* Leach, 1814. The two genera only differ in minor morphological features (Bamber 2009). One of them is the position of the cement gland, a male-only structure found on the femora of most adult males, typically described as proximal in *Sericosura* and distal in *Ammothea*. Despite close morphological similarity, the type specimens of the hydrothermal vent species *S. verenae* (Child, 1987) were determined not to belong to *Sericosura* because the cement gland tube was absent. However, after a reassessment of the genus *Sericosura* and reassignment of *A. verenae* (incl. *Scipiolus thermophilus* Turpaeva, 1988) to *Sericosura* (Bamber, 2009), it has become clear that there are species in both genera for which no cement gland has been observed. *Sericosura dissita*