

# Occurrence of the ribbon worm *Emplectonema neesii* (Nemertea: Hoplonemertea) on the Atlantic coast of Spain

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*The occurrence of the hoplonemertean Emplectonema neesii in the north-east Atlantic has been reported from Iceland to France. This paper provides the first record of E. neesii in Galicia (north-west Spain), possibly the most southern location, if the previous records under this name from the Mediterranean referred to a different species. Morphological data and pictures of this species are provided.*

**Keywords:** Nemertea, *Emplectonema neesii*, new record, north-east Atlantic, Spain

Submitted 14 November 2013; accepted 17 December 2013

## INTRODUCTION

The nemertean fauna of Spain, despite the latter having more than 7800 km of coastline, has been neglected for a long time, with only 14 species recorded until the last decade of the past century (Saiz Salinas, 1987). More recent studies (Gibson & Junoy, 1991; Junoy & Gibson, 1991, 1992; Vernet & Anadón, 1991; Rogers *et al.*, 1993; Herrera-Bachiller *et al.*, 2008; Junoy & Herrera-Bachiller, 2010; Puerta *et al.*, 2010; Junoy *et al.*, 2011) raise the figure to 52 species, still a low number when taking into account that approximately one-third of the 1275 nemertean species recognized (Kajihara *et al.*, 2008) have been reported from European waters (Junoy & Herrera-Bachiller, 2010). Information about Spanish nemertean species is needed to match marine biodiversity knowledge with other countries in Europe.

Nemertean specimens collected between intertidal mussels from Galicia (north-west Spain) revealed the presence of two *Emplectonema* species: the common *Emplectonema gracile* (Johnston, 1837) and the newly recorded *Emplectonema neesii* (Örsted, 1843). The aim of this paper is to document this record and provide new morphological data about the species.

## MATERIALS AND METHODS

Five specimens of *E. neesii* (Figure 1A) were collected intertidally among the byssus threads of *Mytilus galloprovincialis* Lamarck, 1819 in the Ribeira's marina (42°33.75'N 8°59.31'W) on 28 and 31 October 2013. The specimens were examined alive both before and after anaesthetization in 7.5% MgCl<sub>2</sub>. The proboscis of three specimens was dissected to observe the stylet region.

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## RESULTS

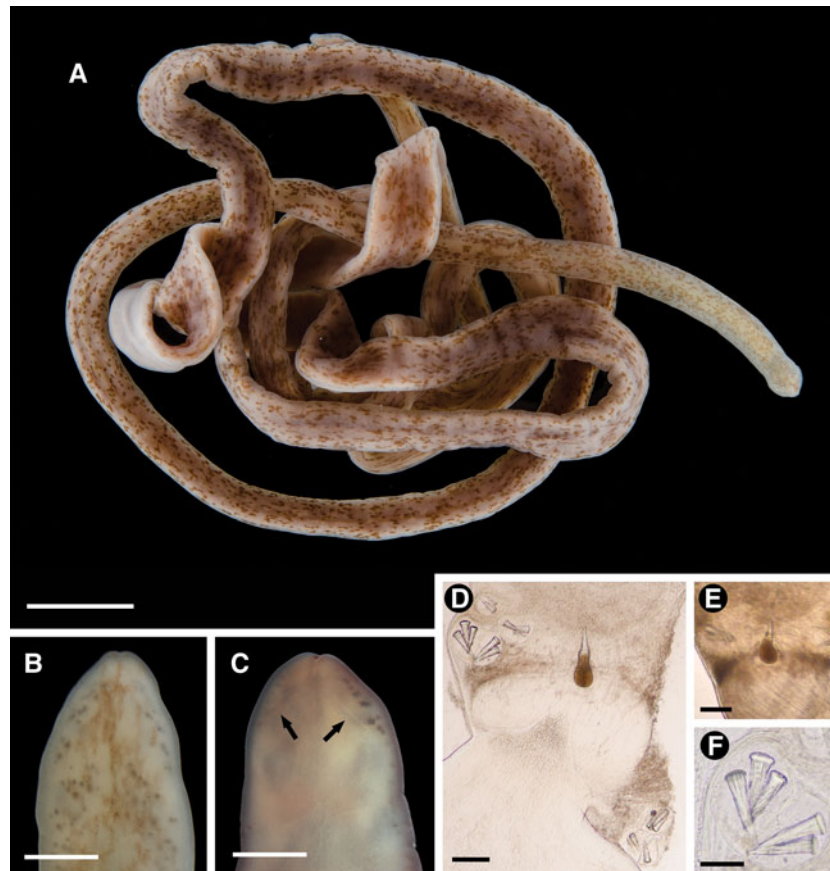
Galician specimens are 40–60 cm long, 4–6 mm wide. Head is orbicular in shape (Figure 1B), not demarcated from the adjacent trunk region. It bears up to 60 small eyes irregularly disposed, being more numerous along the head sides. Two shallow furrows are observed ventrally in the head of one specimen (Figure 1C); no dorsal transverse grooves were observed.

The body is long, cylindrical at the anterior and posterior ends, flattened in the middle part. Colour is light brown, dorsally marked with irregular dark brown pigment streaks; ventrally is uniformly flesh or light brown. The specimens coil and twist their bodies.

The proboscis apparatus occupies only the anterior part of the body. The proboscis is divided into four distinct regions: the anterior chamber, provided with papillae; the bulb region; a small spherical chamber that follows the bulb region; and the slender posterior chamber. Measurements of the stylet apparatus of these specimens are shown in Table 1; an unusual characteristic of the stylet is that its surface is grooved (Figure 1F). Two of the dissected specimens have six accessory stylet pouches (Figure 1D) containing up to 4 stylets each; both specimens showed a waist basis and similar measurements of the stylet apparatus. The other specimen has two pouches and an anomalous asymmetrical basis (Figure 1E).

## DISCUSSION

*Emplectonema neesii* has been recorded in Atlantic cold waters of Greenland (McIntosh 1873–1874; Coe, 1944), Iceland (Friedrich, 1958), Sweden (Sundberg *et al.*, 2007), British Isles (records in Gibson, 1994), Holland (Faasee, 2003) and France (Joubin, 1890, 1894; Gontcharoff, 1955). The only record of *E. neesii* from the Mediterranean was made by Hubrecht (1879) based on a single specimen from Naples that 'unluckily got mislaid before further examination was



**Fig. 1.** *Emplectonema neesii*: (A) photograph of a complete specimen; (B) photograph of the head (dorsal view); (C) photograph of the head showing the cephalic furrows (arrows) (ventral view); (D) microphotograph of a squeezed specimen showing the central stylet and its basis and the six pouches of accessory stylets; (E) microphotograph of a squeezed specimen showing only two pouches of accessory stylets and the anomalous asymmetrical basis; (F) microphotograph of the spirally-grooved stylets. Scale bars: A, 1 cm; B, C, 30 mm; D, E, 100  $\mu$ m; F, 50  $\mu$ m.

possible', leaving the possibility of misidentification. The nemertean fauna of Naples has been subsequently investigated by Bürger (1895) and Iwata (1965), but both failed to recover *E. neesii*, suggesting that the occurrence of the species is doubtful. The Mediterranean was referred into the distribution of the species by subsequent authors (e.g. Joubin, 1890, 1894; Coe, 1944; Friedrich, 1958; Gibson, 1994), but its presence in this warm sea is, in our opinion, doubtful. If this is the case, the present Atlantic Spanish specimens constitute the southernmost record of the species.

Previous literature about *E. neesii* (McIntosh, 1873–1874; Bürger, 1895; Gibson, 1994) described a proboscis apparatus with only two pouches of accessory stylets, as observed in one of the present specimens. The other two dissected

specimens have six pouches each, a morphological character observed for the first time in *E. neesii*. A similar variation was also observed in the congeneric Pacific North American species *Emplectonema buergeri* Coe, 1901. This species has a similar colour pattern to that of *E. neesii*, and was described from Alaskan specimens as having two accessory stylet pouches (Coe, 1901) while specimens from Washington State have six pouches (Roe *et al.*, 2006; Junoy, personal observation).

There is also a discrepancy in the literature about the stylets. McIntosh (1873–1874) describes *E. neesii* as having grooved stylets but Gibson (1994) depicted them to be smooth. To the contrary, *E. buergeri* was originally described as having smooth stylets (Coe, 1901, 1905) but the Washington form has spirally-grooved stylets (Roe *et al.*, 2006; Junoy, personal observation).

Riser (in Gibson, 1995) suggested that some species of *Emplectonema* Stimpson, 1857, for example *E. neesii*, should be transferred to the genus *Paranemertes* Coe, 1901. Moreover, the original type species of the old genus *Neesia* Girard, 1893 is *Amphiporus neesii* Örsted, 1843 (= *E. neesii*). This might constitute the basis to justify the usage of the name *Neesia* as a valid name because *E. neesii* does not likely comprise a monophyletic group with *E. gracile* (Sundberg *et al.*, 2009), the type species of the genus *Emplectonema*.

In this discussion, we retain the name *Emplectonema neesii* until more data clarify its taxonomic status.

**Table 1.** Measurements recorded for the stylet apparatus of three specimens of *Emplectonema neesii*.

Specimen	I	II	III
Length of central stylet ( $\mu$ m)	70	50	50
Length of basis ( $\mu$ m)	90	90	80
Maximum width of basis ( $\mu$ m)	54	45	60
Ratio of basis length to central stylet length	1.3	1.8	1.6
Ratio of basis length to basis width	1.6	2	1.3
Number of accessory stylet pouches	6	6	2
Number of reserve stylets per pouch	4,3,3,3,2,2	4,3,2,2,2,1	2,3

## ACKNOWLEDGEMENTS

We are extremely grateful to the referee Dr H. Kajihara for his constructive comments about the original manuscript. This research was supported by the Franklin Institute, Universidad de Alcalá (Project IUEN2010-001). Juan Junoy thanks Dr Gonzalo Giribet for his invitation to and the hospitality at his laboratory.

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