

**Long live Linnaeus, *Lineus longissimus* (Gunnerus, 1770)
(Vermes: Nemertea: Anopla: Heteronemertea: Lineidae),
the longest animal worldwide and its relatives
occurring in The Netherlands**

Adriaan Gittenberger & Cor Schipper

Gittenberger, A. & C. Schipper. Long live Linnaeus, *Lineus longissimus* (Gunnerus, 1770) (Vermes: Nemertea: Anopla: Heteronemertea: Lineidae), the longest animal worldwide and its relatives occurring in The Netherlands.

Zool. Med. Leiden 82 (7), 1.i.2008: 59-63, figs 1-8, table 1.— ISSN 0024-0672.

Adriaan Gittenberger, National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands; Institute of Biology, University Leiden, P.O. Box 9516, 2300 RA Leiden, The Netherlands (gittenbergera@naturalis.nl).

Cor Schipper, Deltares, P.O. Box 69, 2600 AB Delft, The Netherlands (cor.schipper@deltares.nl).

Keywords: Nemertea; *Lineus longissimus*; *Emplectonema echinoderma*; ribbon worms; Gunnerus, Linnaeus. Attention is called for *Lineus longissimus*, the longest animal in the world, and especially for its occurrence in The Netherlands. A ribbon worm species new for the Dutch fauna is recorded: *Emplectonema* cf. *echinoderma* (Marion, 1873).

Introduction

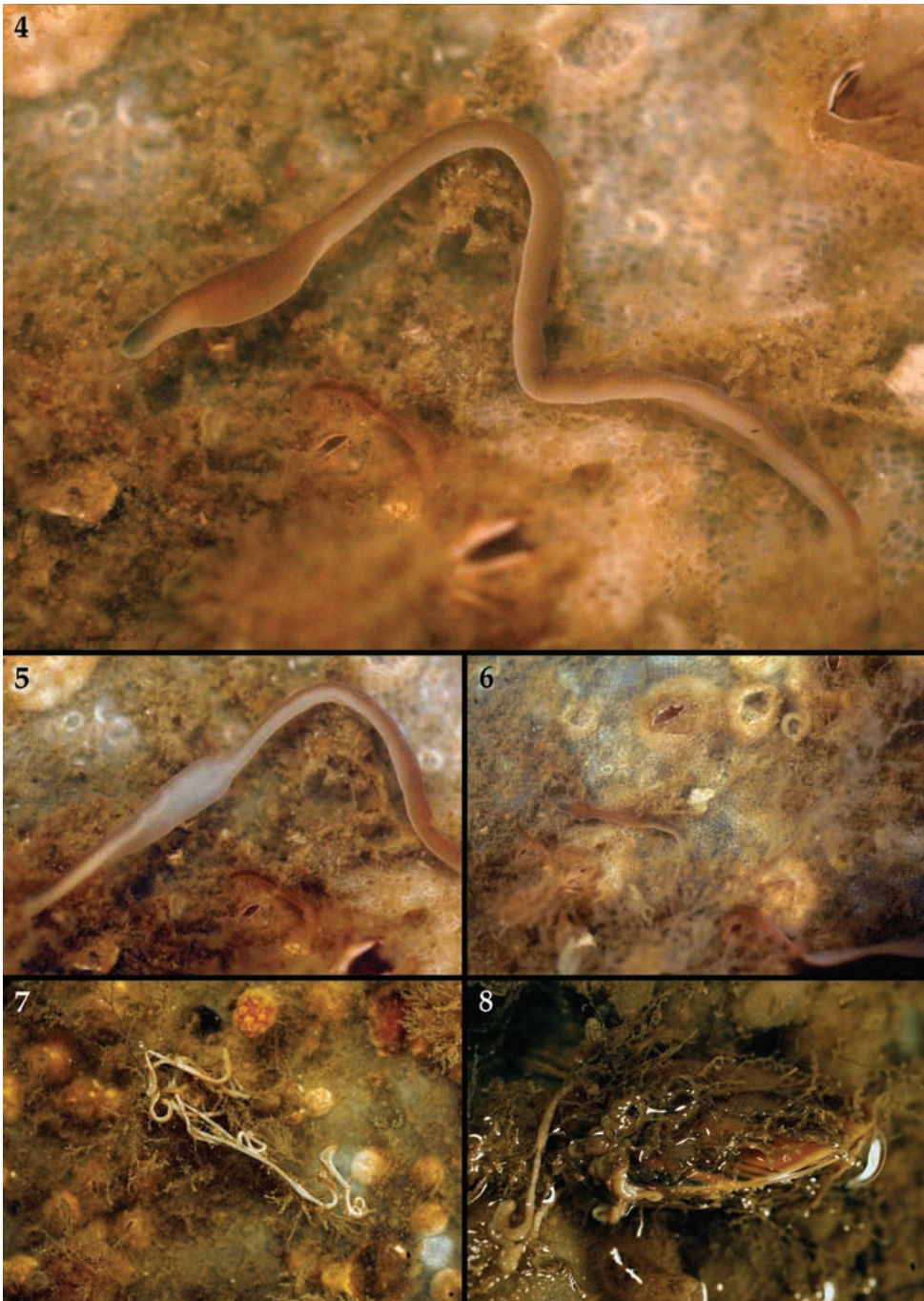
It is not generally known that the longest animal worldwide (Carwardine, 1995: 232) can be found along the coasts of The Netherlands. Scuba-divers in the southern estuaries Grevelingenmeer and Oosterschelde, regularly come across these unusually long, thin animals (Faasse, 2003; Jong, 2007). The bootlace worm *Lineus longissimus* (Gunnerus, 1770) is a ribbon worm of the phylum Nemertea that can reach a length of up to 60 m (Moen & Svendsen, 2004: 155), being only 5 to 10 mm in width (figs 1-3). Even though this record length may not be accurate, i.e. no voucher specimen is present, specimens up to 30 m long have been encountered repeatedly (Hayward & Ryland, 1995; Van der Land et al., 2005) and lengths of 5 to 10 m are normal. The animals slowly crawl over sand, in crevices and between rocks, in search of a prey that can be stunned and swallowed with their extendable, poisonous proboscis. Looking like a thin, slimy, brown line they lie over the bottom (fig. 1) or partly float in the water column. When touched these worms can quickly retract themselves over meters of surface into a crevice, often surprising scuba-divers by doing so.

Etymology of *Lineus longissimus*

Already in 1770, the Norwegian bishop of Trondheim, Johan Ernst Gunnerus (1718-1773), described the longest animal of the world in a publication about sea animals of Norway as *Ascaris longissima* (see Gunnerus, 1770). Even though Gunnerus did not name this species after Carl von Linné, they did know each other very well and exchanged many letters about the Linnean system and especially plant taxonomy. Gunnerus was of



Figs 1-3. *Lineus longissimus* (Gunnerus, 1770). 1-2: In situ photographs in 2003, off Scharendijke, The Grevelingen. Photos: A. Gittenberger. 3: Detail of figure from Sowerby (1804-1806: Pl. 8).



Figs 4-8. *Emplectonema cf. echinoderma* (Marion, 1873), photographs of a specimen on 14 × 14 cm SETL monitoring-plate, 18 September 2007. 7: Diameter of the black hole in the centre top of the image = 8.0 mm. Photos: A. Gittenberger.

also of importance for Linnaeus because he sent him many rare plants and animals (Jørgensen, 2007). In 1767 Linnaeus (latinization of Linné) named the impressive plant genus *Gunnera* after Gunnerus. About thirty years later, in 1806, the British botanist James Sowerby (1757-1822) described the genus *Lineus*, including the species description and a drawing (fig. 3) of what was then called *Lineus longissimus* (Gunnerus, 1770). He did not refer to Gunnerus and did not include an etymology in the description. It is not unlikely though that James Sowerby, who studied at the Royal Academy of London, did know that Carl von Linné was born exactly 99 years earlier, and that people would assume that the genus was dedicated to him. In that case, the genus should have been named *Linneus*, i.e. with a double instead of a single "n". He most probably described it after the Latin *lineus*, "made of linen", or as the conjugation of the Latin noun for line, because of the thread-like shape of the animal. Whether the introduction of the genus *Lineus* close to a century (99 years) after the birth of Linné was or was not a coincidence, remains uncertain. Certainly coincidental is the present union of Linnaeus and Gunnerus in the name of *Lineus longissimus* (Gunnerus, 1770), a far-reaching creature.

A new ribbon worm for The Netherlands

Even though many ribbon worms like *Lineus longissimus* are neither small nor inconspicuous, many are overlooked or have not been looked for in The Netherlands until recently. Therefore, Faasse (2003) could record eleven species as new to the Dutch fauna, raising the number of known Dutch ribbon worm species to eighteen (table 1). Here we record an additional species for the Dutch fauna, i.e. *Emplectonema cf. echinoderma* (Marion, 1873). It was encountered during the chemical and biological assessment management study started 2006 by the Dutch Ministry of Transport, Public Works and Water Management, in which port authorities monitor the quality of the water system in a broader sense, including its ecological functioning. The methods of the international marine monitoring project SETL were used in seaports in The Netherlands, as designed by the Dutch ANEMOON foundation in cooperation with the Smithsonian Marine Invasions Laboratory, U.S.A. Ten PVC-plates of 14 × 14 cm are hung one meter under the water surface, attached to a floating dock, horizontally, renewed and checked for fouling invertebrates and plants every three months. *Emplectonema cf. echinoderma* (figs 4-8) was found 18 September 2007 on four of the ten plates deployed earlier on 20 June 2007 in the navy port of Den Helder. Each of the four specimens is about 15 cm in length, 0.8-1.2 mm thick, uniformly orange-red dorsally and relatively pale to whitish ventrally (figs 4-8). The colour pattern is very similar

Table 1. Ribbon worm species (Nemertea) of The Netherlands (see Faasse, 2003).

Ribbon worm species (Nemertea)
<i>Amphiporus lactifloreus</i> (Johnston, 1828)
<i>Carcinonemertes carcinophila</i> (Kölliker, 1845)
<i>Cephalothrix ruffifrons</i> (Johnston, 1837)
<i>Emplectonema cf. echinoderma</i> (Marion, 1873)
<i>Emplectonema gracile</i> (Johnston, 1837)
<i>Emplectonema neesii</i> (Ørsted, 1843)
<i>Lineus longissimus</i> (Gunnerus, 1770)
<i>Lineus. bilineatus</i> (Renier, 1804)
<i>Lineus viridis</i> (Müller, 1774)
<i>Lineus ruber</i> (Müller, 1774)
<i>Nemertopsis flavida</i> (McIntosh, 1873)
<i>Oerstedtia dorsalis</i> (Abildgaard, 1806)
<i>Prosorhochmus claparedii</i> Keferstein, 1862
<i>Ramphogordius sanguineus</i> (Rathke, 1799)
<i>Tetrastemma</i> sp. aff. <i>candidum</i> (Müller, 1774)
<i>Tetrastemma coronatum</i> (Quatrefages, 1846)
<i>Tetrastemma flavidum</i> Ehrenberg, 1828
<i>Tetrastemma robertianae</i> McIntosh, 1873
<i>Amphiporus lactifloreus</i> (Johnston, 1828)

to that of *Emplectonema neesii*, but that species is much thicker, i.e. 5-6 mm (Hyward & Ryland, 1995). It also resembles *Emplectonema gracile*, as pictured by Faasse (2003: p.104), but that species is also broader, i.e. 3-4 mm, and green instead of red. The characteristics of the specimens from Den Helder resemble most those of *E. echinoderma* as described by Hyward & Ryland (1995: 158). It is an orange-red ribbon worm with a length of up to 20 cm, and a width of 1-2.5 mm. The internal anatomy of the animals has not yet been examined in detail. Therefore, the identification should still be confirmed.

Acknowledgements

We thank Dr L.B. Holthuis for allowing us to print the illustration of *Lineus longissimus* in Sowerby (1805: Pl. 8) from his library, and we thank Martine Brouwer and her colleagues of Den Helder port traffic control for their assistance.

References

- Carwardine, M. 1995. The Guinness Book of Animal Records. Guinness Publishing.— Enfield.
- Faasse, M., 2003. Nederlandse mariene Snoerwormen (Nemertea).— Zeepaard 63: 98-109.
- Gunnerus, J.E., 1770. Nogle smaa rare og meestendeelen nye Noske Søedyr.— Skrifter som udi det Kiøbenhavnske Selskab af Lærdoms og Videnskabers Elskere ere fremlagte og oplæste 10: 166-176.
- Hayward, P.J. & J.S. Ryland, 1995. Handbook of the marine fauna of North-West Europe. Oxford University Press: i-xi, 1-800.— Oxford.
- Jong, J. de, 2007. 'Gewoon' in de Oosterschelde.— Onderwater Sport 38: 27.
- Jørgensen, P.M., 2007. The importance of Bishop Gunnerus for Linnaeus.— The Linnean 23(4): 35-40.
- Land, J. van der, W. Sijm & R. Sluys, 2005. Wormen. 114-139. In: Leewis, R., D. Willemse, P. Sloof-Spijker & C. Jacobusse (eds.), 2005. Zeefauna in Zeeland. St. Het Zeeuwse Landschap: 1-207.— Heinkenszand.
- Moen, F.E. & E. Svendsen, 2004. Marine fish & invertebrates of Northern Europe. AquaPress, Southend-on-Sea: 1-608.— Essex.
- Sowerby, J., 1804-1806. The British miscellany; or coloured figures of new rare, or little known animal subjects; many not before ascertained to be inhabitants of the British Isles; and chiefly in the possession of the author.— R. Taylor, London.

Received: 6.xi.2007

Accepted: 9.xi.2007

Edited: J. van Tol

