

MARINE RECORD

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First record of *Syllis vittata* (Polychaeta: Syllidae) in the Dutch North Sea

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Abstract

Background: *Syllis vittata* is present from British Waters to the Mediterranean Sea, Morocco and the Canary Islands and recorded from the South African coast and Indian Ocean.

Results and conclusion: In this paper, *S. vittata* is reported for the first time in the Dutch EEZ.

Keywords: Syllidae, *Syllis vittata*, polychaeta, North Sea, Gas platform, Distribution, First record

Background

Syllidae is a highly diverse family of polychaete worms with over 700 species described in 74 different genera (Aguado and San Martín 2009; San Martín and Aguado 2014). They are easily recognizable by their proventriculus, which is situated behind the pharynx and works as a suction pump during feeding processes (Aguado and San Martín 2009; Fauchald and Jumars 1979; San Martín 2003), often visible through the body wall. However, the taxonomy of the Syllidae is often problematic due to the high variability of its morphological features and life history traits (San Martín 2003). It has been recently divided into five subfamilies (Anoplosyllinae, Autolytinae, Eusyllinae, Exogoninae and Syllinae) according to phylogenetic relationships (Aguado and San Martín 2009).

Syllidae mostly reproduce by epitoky, within which two modes are recognized: epigamy (characteristic for Anoplosyllinae, Eusyllinae and Exogoninae) and schizogamy, i.e., stolonization (characteristic for Syllinae and Autolytinae; Aguado and San Martín 2009; Franke 1999; Musco et al. 2010). The reproductive strategy of *Syllis vittata* Grube 1840 is still unknown, however it is believed to be similar to the majority of other Syllinae species (Musco et al. 2010). Furthermore, these authors suggest that *S. vittata* might be a simultaneous hermaphrodite, though not necessarily with internal or self-fertilization.

Syllids are primarily observed in shallow waters in a variety of marine habitats worldwide, although they can also be found in deep waters (San Martín 2003). *S. vittata*, in particular, is present in the Eastern Atlantic, from British Waters to Morocco and the Canary Islands (López et al. 1996; San Martín 2003), in South African coast (Berrisford 1969), in Indian Ocean (Mozambique and Natal; López et al. 1996; Musco and Giangrande 2005; San Martín 2003), and in the Mediterranean Sea (López et al. 1996; Musco and Giangrande 2005; San Martín 2003). The type locality is Palermo (Italy). In the North Sea, early records suggest that this species was only found on the coast of Norfolk (Ostler 2005). In this study, *Syllis vittata* is recorded for the first time in the Dutch area of the North Sea.

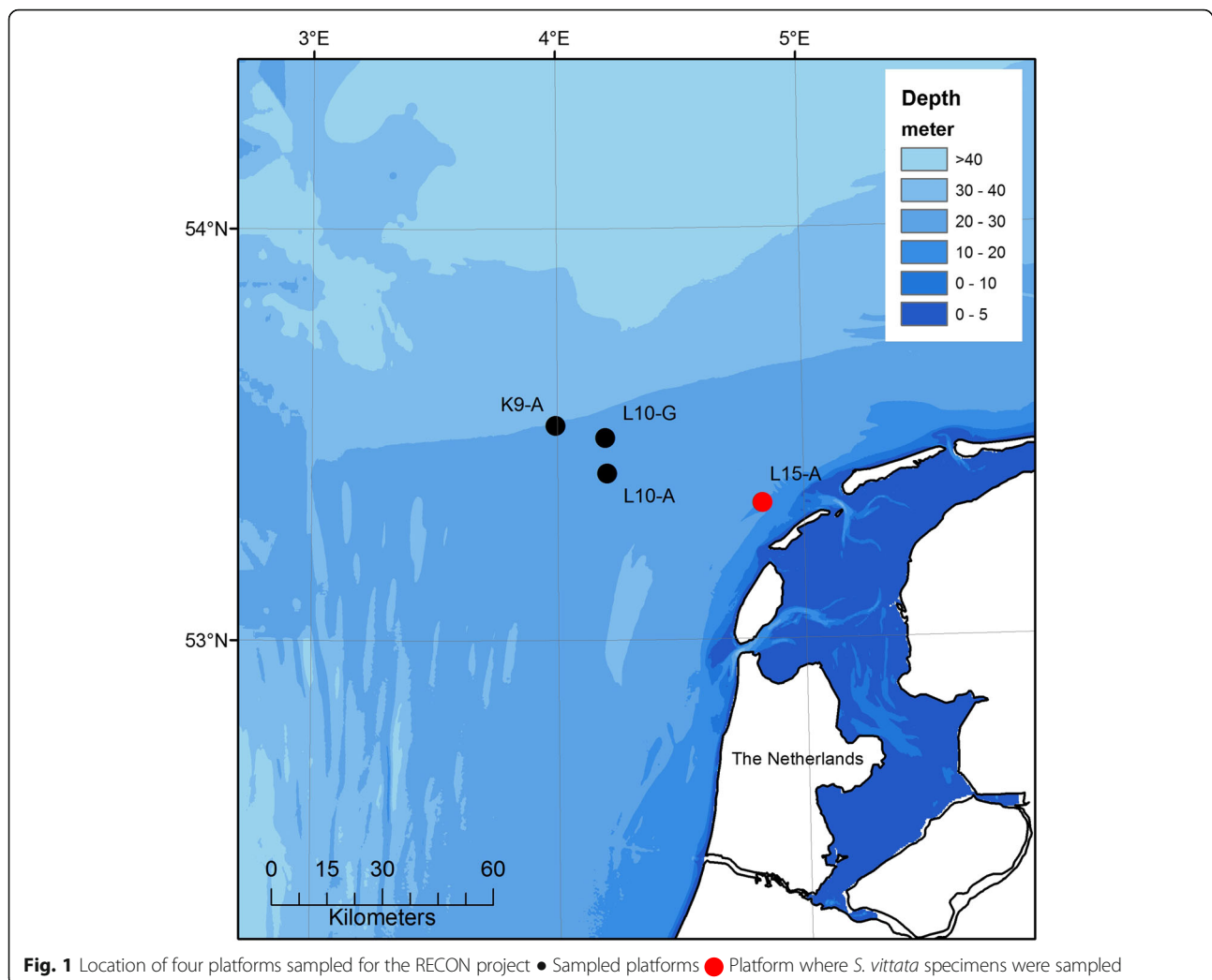
Methods

Two specimens of *Syllis vittata* were found in the Dutch area of the North Sea, on a gas platform (platform L15-A, situated 11 km off the coast of the island of Vlieland; Fig. 1), in samples processed for the RECON (Reef effects of structures in the North Sea: Islands or connections?) project. Samples were collected with a surface supplied airlift, as described in Coolen et al. (2015a) and fixed in a borax buffered 6% formaldehyde solution. In the laboratory, before the identification process, specimens were placed in a 70% ethanol and 3% glycerol solution. For the identification, Keys provided by San Martín (2003) and San Martín and Worsfold (2015) were used. Both specimens were stored at the Wageningen Marine Research benthic reference collection.

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Results

Material examined

L15-A platform, The Netherlands, 53.3295°N, 4.8301°E (WGS84), 5 and 6 June 2014, 2 specimens, 7 and 20 m depth.

SYSTEMATICS

Order PHYLLODOCIDA Dales 1962

Suborder NEREIDIFORMIA

Family SYLLIDAE Grube 1850

Subfamily SYLLINAE Rioja 1925

Genus *Syllis* Savigny in Lamarck 1818

Syllis vittata Grube 1840

Syllis (*Typosyllis*) *vittata* Fauvel 1923:263–264, fig. 98i–l. Day 1967:252, Fig. 12.4.m–o

Syllis aurita Claparède, 1864: 539–540, plate V fig. 5

Syllis buskii McIntosh, 1908

Syllis vittata San Martín 2003:430–432, figs. 236–237.

General distribution

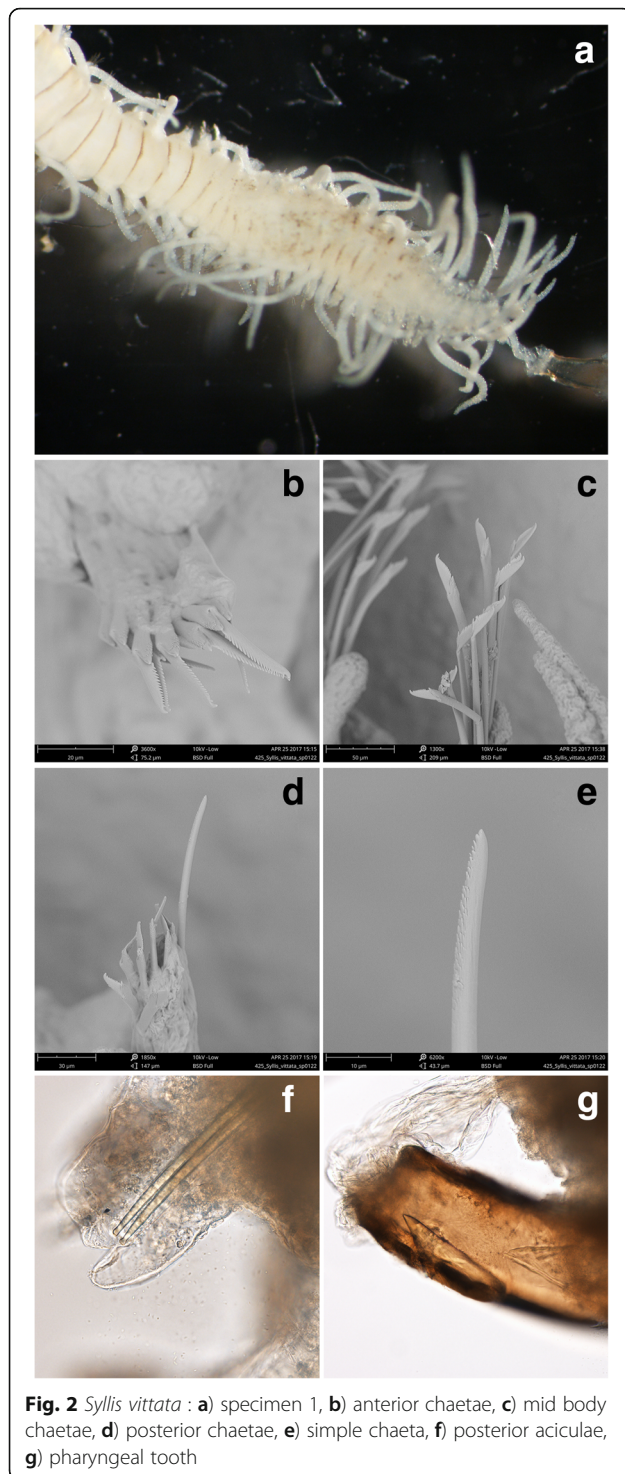
From British Waters to the Mediterranean Sea, Morocco and the Canary Islands (Eastern Atlantic) and recorded on the South African coast, Mozambique and Natal (Indian Ocean)

Type locality

Palermo (Italy)

Description of examined material

Length up to 10.75 mm, width 0.9 mm. Body broad, robust and cylindrical, 40 chaetigers, with a dorsal dark transverse stripe per segment (Fig. 2a). Prostomium wider than long, with two pairs of eyes in a trapezoidal arrangement. Antennae moniliform; median antenna inserted in the middle of the prostomium, with 30 articles; lateral ones inserted before the anterior eyes, with 23–25 articles. Dorsal tentacular cirri with 35–38 articles and ventral cirri with 21–24 articles, very similar to dorsal ones. Dorsal



cirri alternating long (longer than the width of the corresponding segment), with 30–35 articles, and short (as long as the corresponding segment), with 20–24 articles. Anterior parapodia with 20 compound chaetae (Fig. 2b), mid body parapodia with 15 (Fig. 2c) and 12 in posterior parapodia (Fig. 2d), all unidentate. One bifid

serrated dorsal simple chaeta (Fig. 2e), only present in posterior parapodia. Aciculae possess a rounded tip (Fig. 2f), and their number decreases towards the posterior end, with only one in the last chaetigers. Pharynx extending through 10 segments, with a large, acute tooth, encircled by 10 large marginal papillae, placed near the pharyngeal opening (Fig. 2g). Proventriculus extending through 9 segments, with 38 rows of muscle cells.

Discussion

The presence of the polychaete *Syllis vittata* off the coast of the island of Vlieland represents its first record in the Dutch Exclusive Economic Zone (EEZ). With this record, this species has only been found on two separate locations in the North Sea, with the other observation being old records off the coast of Norfolk (United Kingdom) by the Joint Nature Conservation Committee (JNCC), in 1993 (Ostler 2005).

The scarce observations of this species in the North Sea may be a result of its apparent preference for hard-bottom substrates, as *Syllis vittata* is usually found on rocky shores (Antoniadou et al. 2004; Cosentino 2011; López et al. 1996; Simon et al. 2014), calcareous substrates (Cardell and Gili 1988; López et al. 1996; San Martín 2003) and on *Sabellaria* and *Mytilus* colonies (López et al. 1996; San Martín 2003). Thousands of other artificial hard substrates are present in the Dutch North Sea (Coolen et al. 2015b) but natural hard substrates are scarce (Coolen et al. 2016). The biodiversity of hard substrates is understudied in the Netherlands. Its predilection for coastal habitats and a lack of research effort may justify why this species wasn't found on the other two platforms analysed.

The wide distribution of *Syllis vittata* suggests that this might be a cryptogenic species. However, more information is needed to confirm this hypothesis.

Nevertheless, it is likely that *Syllis vittata* will colonise all the available hard substrates, and spread throughout the North Sea. The distribution limits of this species is, then, yet unclear.

Conclusion

Two specimens of *Syllis vittata* were observed on a gas platform 11 km off the coast of the island of Vlieland. This is the first record of this species in the Dutch EEZ. Ongoing monitoring is needed to verify the spread or loss of this species in the North Sea.

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Availability of data and materials

The data that support the findings of this study are available from Wageningen Marine Research but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Wageningen Marine Research.

Authors' contributions

IMD and MS carried out the identification of all Polychaeta present in all the samples. JWPC did the sampling and designed the study. BvdW and JC assisted with identifying the samples. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable.

Ethics approval and consent to participate

Not applicable.

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