Identification guides for the NMBAQC Scheme: 2. Goniadidae, with notes on Glyceridae (Polychaeta) from shallow seas around the British Isles

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The following key and notes are designed to help standardise the processing of benthic macrofaunal samples through the National Marine Biological Analytical Quality Control (NMBAQC) Scheme. It is the second such guide and the aims were summarised in the first (Worsfold, 2006). In addition to providing a summary of identification features and ecological notes, the guides are intended to give some indication of names and taxonomic levels for use through the Scheme.

Goniadidae

The Goniadidae are errant polychaete worms. There has been no guide suitable for British species, though a worldwide revision (Böggemann, 2005) has recently become available. They have elongated bodies with a conical prostomium, bearing four small antennae, as do the related Glyceridae, but Goniadidae have a ring of small jaws, rather than four large jaws. They may also have a row of chevrons on either side of the proboscis and biramous posterior parapodia (both of which are lacking in the Glyceridae. The jaw ring is at the tip of the everted proboscis but appears further back than the chevrons when the proboscis is retracted; mouthparts can often be seen through the body if the skin is pressed or stretched slightly. Goniadids are generally more slender than glycerids and more strongly pigmented. They are mostly found in marine subtidal sediments. The Species Directory (Howson & Picton, 1997) lists seven species in three genera. Four of them are included in Fauvel (1923) and an additional two in Hartmann-Schröder (1996). An additional species is detailed by Walker (1974) and two more liable to be found in British shallow waters are described by Böggemann (2005).

The key is adapted from one made at Unicomarine in 2003, which was compiled mainly from the literature detailed above. Edits have been made using Böggemann (2005) and following the 2006 NMBAQC taxonomic workshop, which included examination of goniadids. Some literature covering each species is indicated by a list of single initials following the authority. Colours refer to alcohol preserved specimens.

1. Posterior neuropodia with 2 pre-chaetal lobes; proboscis with chevrons; neurochaetae all spinigerous; notochaetae capillary or acicular ..... *Goniada* 5

   Posterior neuropodia with 1 pre-chaetal lobe; proboscis with or without chevrons; neurochaetae may include falcigers and spinigers; notochaetae all acicular, where present 2

2. Proboscis without chevrons; neurochaetae with spinigerous blades; prechaetal lobes short .....

   ..... *Glycinde nordmanni* (Malmgren, 1866); F (as *Eone*), H, B

   Proboscis with chevrons; neurochaetae may include spinigers and falcigers; prechaetal lobes long 3

3. All parapodia uniramous (without notochaetae) ..... *Progoniada regularis* Hartman, 1965 B

   Sub-biramous parapodia present (with spine-like notochaetae), following 10-30 uniramous parapodia..... *Goniadella* 4

4. Transitional parapodia with notochaetae arising dorsal to dorsal cirrus; 22-24 uniramous chaetigers; 1-2 spinigerous chaetae per bundle (alongside falcigers); 17-24 proboscis chevrons

   ..... *Goniadella bobretzkii* (Annenkova, 1929); H, W, B

   Transitional parapodia with notochaetae arising at level of dorsal cirrus; 26-30 uniramous chaetigers; 3-5 spinigerous chaetae per bundle (alongside falcigers); 25-30 proboscis chevrons .

   ..... *Goniadella gracilis* (Verrill, 1873); W, B

5. Notochaetae robust, acicular; 60-70 uniramous anterior segments.....

   ..... *Goniada emerita* Audouin & Milne-Edwards, 1834; F, B

   Notochaetae all fine capillaries.....6

6. Anterior 17-51 neuropodia with 1 pre-chaetal lobe; first 31-51 parapodia uniramous; no transitional mid region with partially developed notopodia; notopodia with single acicular lobes (excluding dorsal cirrus)..... *Goniada maculata* Oersted, 1843; F, H, B

   From the second to sixth parapodium (to 13th in juveniles), all neuropodia have 2 pre-chaetal lobes; 29-69 uniramous parapodia, which may include 20-50 transitional mid body segments, with partially developed notopodia; notopodia with pre and post-acicular lobes in addition to dorsal cirrus (notopodial pre-chaetal lobes much longer than post-chaetal lobes).....7

7. Up to 29 or 38 uniramous anterior parapodia ..... *Goniada norvegica* Oersted, 1845; F, H, B

   Up to 45 or 69 uniramous anterior parapodia .....

   ..... *Goniada pallida* Arwidsson, 1898; H, B (as *G. vorax*)

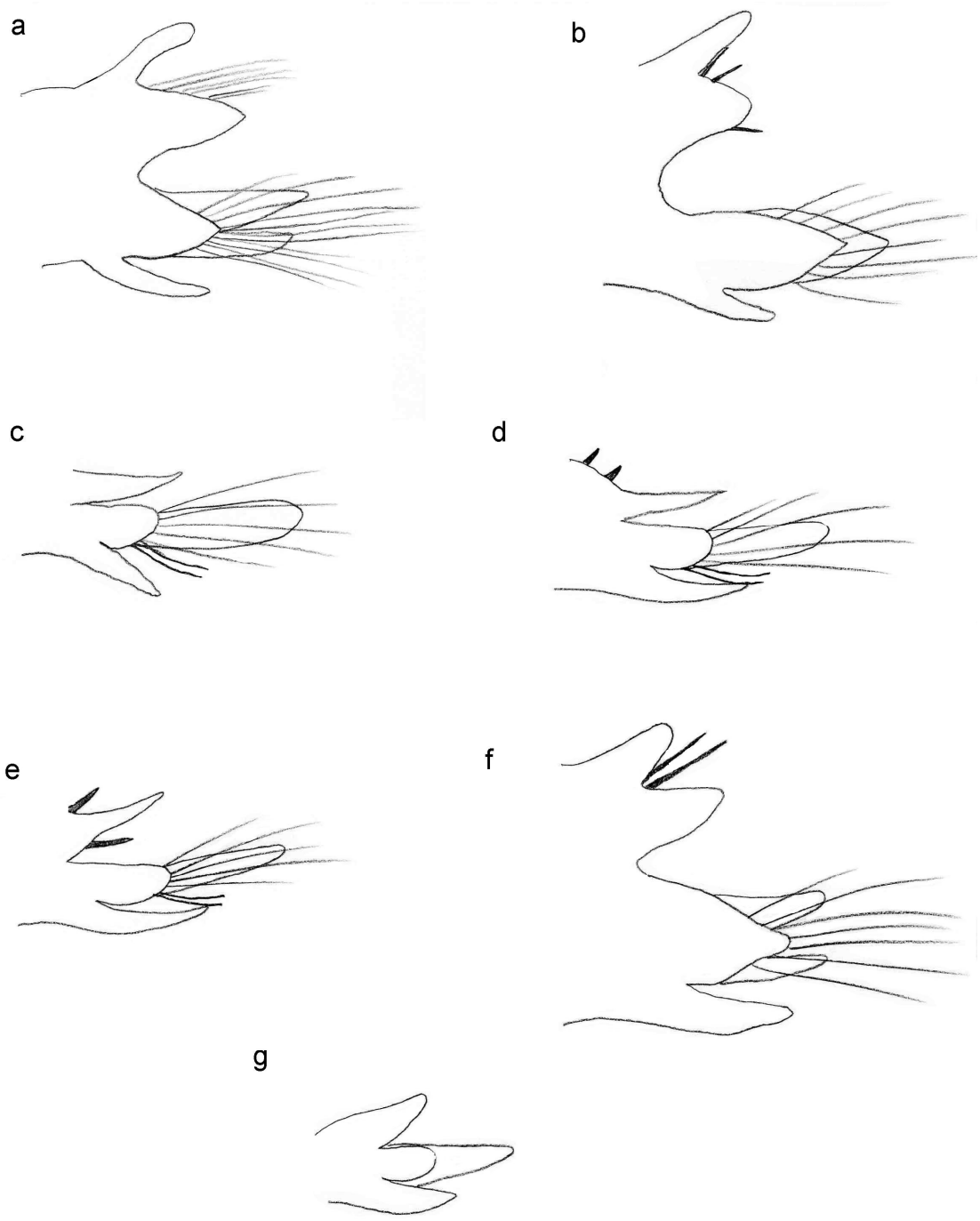

Fig. 1. British goniadids; posterior views of posterior parapodia, from left to right: a) *Goniada maculata* b) *Glycinde nordmanni* c) *Progoniada regularis* d) *Goniadella bobretzkii* e) *Goniadella gracilis* f) *Goniada emerita* and g) anterior parapodium of *Goniada maculata*; c and d adapted from Böggemann, (2005). Photographs have been posted on the MarBEF website (www.marbef.org) and on the NMBAQC Scheme website (www.nmbaqcs.org), along with this article.

Both *Goniada maculata* and *Glycinde nordmanni* are widespread around the coast in subtidal mixed gravel sediment, though neither has been recorded as dominant in any sample we have seen. Both are variegated in shades of brown but *G. nordmanni* is generally glossier, with a more uniform colour and has more distinct eyes. *G. emerita* is often found in subtidal gravel in the south west of the British Isles, where it may be one of the largest polychaetes noted but is rarely seen in large numbers. Fresh specimens are often greenish and iridescent. *G. pallida* seems to be most common in deeper (below 30m), stable muddy sediments, particularly in the north and west. It is glossy with a uniform pale colour, though all our specimens are stained. Members of the genus *Goniadella* are widespread in subtidal moderately clean gravel all around the coast and may occasionally be found in high numbers (up to 100 per m^2). The two species are often not distinguished but all examined for this article were found to be *G. gracilis*, which is small and narrow, yellowish, with brown parapodial lobes. *Progoniada regularis* and *Goniada norvegica* are offshore species, found in deep (over 50m) waters in the North Sea and Atlantic.

Although the recent worldwide revision (Böggemann, 2005) represents the latest view on taxonomic issues, it includes many unlikely species distributions. It may be that some have been introduced globally or that there is a true continuum between different climate and depth bands for some species but, as such distributions have rarely been demonstrated as genuine, it seems best to use names with temperate north Atlantic type localities where available. We would, therefore, recommend continued use of the name *Goniada pallida* for British material, in preference to the Brazilian *G. vorax* (Kinberg, 1865), in spite of Böggemann's synonymy of *G. pallida* with *G. vorax*; the MarBEF website also lists *G. pallida* and not *G. vorax*.

As for all groups, additional species should be expected in deeper water. Possibilities described by Böggemann (2005) include *Bathyglycinde profunda* (Hartman & Fauchald, 1971), *B. sibogana* (Augener & Pettibone in Pettibone, 1970) and *Goniada* cf. *brunnea* Treadwell, 1906, which is reported from the temperate North Atlantic by Böggemann (2005) but its type locality is Hawaii. In addition, the predominantly Mediterranean species *G. hexadentes* Böggemann & Ebiye-Jacobsen 2002 and *G. gigantea* (Verrill, 1885) might one day be found in the south.

No goniadid species has yet been found in sufficient quantity in the same survey for use in any NMBAQC Scheme ring test.

Glyceridae

Most participants would be familiar with the key by O'Connor (1987), as the standard literature for glycerids; it has also been produced as a key and a revised version was presented at the 2006 workshop. Of the 12 species (including one complex) of *Glycera* described there, 10 are listed in the Species Directory (Howson & Picton, 1997); two were considered not British. The deep water *Glycerella atlantica* Wesenberg-Lund, 1950, is also excluded.

A worldwide revision (Böggemann, 2002) is now available. The main changes are as follows. *Glycera gigantea* Quatrefages, 1865 has been synonymised with *G. fallax* Quatrefages, 1850, *G. mimica* Hartman, 1965 has been synonymised with *G. capitata* Ørsted, 1842 and *G. rouxii* Audoin & Milne-Edwards, 1833 has been synonymised with *G. unicornis* Savigny, 1818. The latter synonymy, however has a "?" in Böggemann's list of described glycerids, as does the synonymy of *G. dayi* O'Connor, 1987 with *G. celtica* O'Connor, 1987. We would recommend maintaining *G. rouxii* as separate taxon for the time being. Böggemann uses only proboscis papilla shape to distinguish between *G. alba* (O.F. Müller, 1776) and *G. tridactyla* Schmarda, 1861, which seems to gives different identifications from use of parapodial structure; the separation of these species remains a problem. Böggemann includes 9 *Glycera* with records near the British Isles, including *G. capitata*, which had been considered non-British, and *G. lapidum* Quatrefages, 1866, which had been seen as a complex; we recommend maintaining the aggregate assignment. We are then left with 9 British shallow water species if we maintain the two questionably synonymised taxa as separate.

Glycera tridactyla Schmarda, 1861 may be common in mixed sediments in the south and west but there is much confusion with *G. alba* (O.F. Müller, 1776), which is ubiquitous and common in shallow mixed sediments but never dominant and generally associated with a rich fauna. *G. rouxii* Audoin & Milne-Edwards, 1833 can be common but never dominant in muddy sediments, particularly in the north and west, where it is found with more abundant mud-dwelling species. *G. fallax*

Quatrefages, 1850 is occasionally found in rich, mixed gravel sediments in the south and west. *G. tesselata* Grube, 1863 and *G. celtica* O'Connor, 1987 are not common and are often confused with other species. *G. oxycephala* Ehlers, 1887 and *G. lapidum* agg. Quatrefages, 1866 are ubiquitous and common in mobile sand and gravel, where they may be a dominant component of the biotope but usually not in very high numbers, due to the generally poor fauna of such habitats; *G. lapidum* agg. from muddier habitats are likely to eventually prove distinct. *G. capitata* Ørsted, 1842 is northern and not definitively recorded from British waters.

Most *Glycera* appear white as preserved specimens when small, though larger specimens may be plain brown and some are slightly variegated but less so than *Goniada maculata*.

Glycera lapidum agg. has appeared in one NMBAQC Scheme ring test (RT23) and one discrepancy (*G. tesselata*) was recorded for 15 participants, although names of species in the complex were also used.

Acknowledgements

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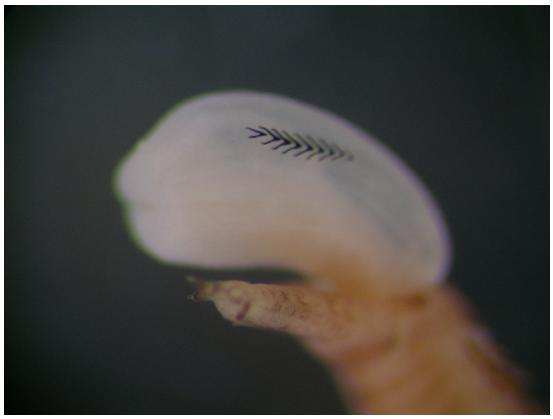
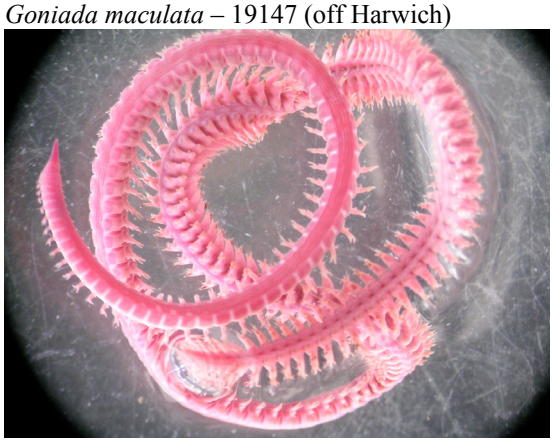
Goniada maculata – 19147 (off Harwich)



Goniada maculata – 19147 (off Harwich)

Goniada norvegica (North Sea)



Goniada pallida – 34009 (Belfast Lough)

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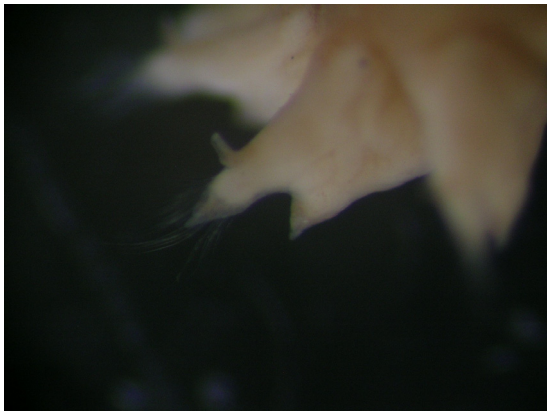
Goniada emerita (English Channel)

Goniadella gracilis (Cornwall)

Glycinde nordmanni – 37185 (North Sea)



Glycinde nordmanni – 37185 (North Sea)