



A new species of *Ophryotrocha* (Annelida: Dorvilleidae) associated with fish farming at Macquarie Harbour, Tasmania, Australia

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Abstract

Ophryotrocha shieldsi, sp. nov. is described from Macquarie Harbour, Tasmania, Australia, where it occurs in high densities beneath the sea cages of fish farms. SCUBA and ROV underwater observations revealed closely spaced mounds of aggregations of the new species. It is closely related to *O. lobifera* Oug, a species reported from fish farms and whale-falls in the North Sea, from which it can be distinguished by its ovate rather than triangular dorsal lateral lobes, palps with small globular rather than longer digitate palpostyles, and additional jaw differences.

Key words: Polychaeta, fish farms, organic enrichment, taxonomy

Introduction

Farming of Atlantic salmon (*Salmo salar* Linnaeus), and ocean trout [*Oncorhynchus mykiss* (Walbaum)] in sea cages has been carried out for more than two decades in Tasmania, Australia. Intensive fish farming produces organic enrichment of the seabed as a result of fish faeces and excess food, leading to an altered benthic fauna, dominated by opportunistic species. Areas of high organic enrichment can develop sediment anoxia and patches of *Beggiatoa*-type mats of sulphur-oxidising filamentous bacteria, typical of deep-sea reducing habitats such as hydrothermal vents and cold seeps (Findlay & Watling 1995).

We are describing below *Ophryotrocha shieldsi*, a new polychaete species of the family Dorvilleidae that occurs in great densities (estimated at up to 100,000 individuals m⁻²) beneath sea cages at Macquarie Harbour, Tasmania (Fig. 1). Dorvilleids are well known as opportunists, occurring in high densities in organically enriched habitats in shallow water near sewers and pulp mill outfalls (Hilbig 1995) and cage farming of fish (Karakassis et al. 2000), as well as in deep water on whale-falls (Wiklund et al. 2009) and hydrothermal vent and seep sites (Desbruyères et al. 2006).

The systematics of Dorvilleidae is presently unresolved and in need of a revision. The discoveries of hydrothermal vent and whale-fall environments in the last decades have greatly increased the number of known dorvilleid species, particularly of the genus *Ophryotrocha* Claparède & Meczников. In an attempt to revise the group, Orensanz (1990) erected, among others, the genus *Palpiphitime* and designated *Ophryotrocha lobifera* Oug the type species, originally described from a strongly organically enriched environment in Norway. The genus was recently redefined with an emphasis on its jaw structure, demonstrating that *Palpiphitime* not only differs from *Ophryotrocha* by the combination of its soft morphological characters but also its jaws (Paxton 2009). The same study described *P. lipovskyae* Paxton from near an Atlantic salmon farm in Hecate Strait, British Columbia, Canada.

Another recent study of dorvilleids from a whale-fall in the north-east Atlantic described three new dorvilleids, one closely related to *P. lipovskyae*, and carried out phylogenetic analyses of available *Ophryotrocha*, *Iphitime* and *Palpiphitime* species based on the nuclear gene H3 and the mitochondrial genes