

## A review of the current status of the *Polydora*-complex (Polychaeta: Spionidae) in Australia and a checklist of recorded species

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### Abstract

In 1885 Australia's first recorded marine pest, a mudworm of the *Polydora*-complex (Spionidae), was identified on Hunter River, New South Wales, oysters (*Saccostrea glomerata* Gould, 1850). Mudworm is still a serious pest of cultured molluscs in Australia but, although of great concern to many, relatively little progress has been made in resolving the problem. One hundred and thirty years later the identity and life history of this pest remains unclear. The longevity of this problem in Australia is largely due to unaddressed issues of basic taxonomy. This review addresses these issues by presenting the information currently available on the *Polydora*-complex species in Australia, including taxonomy; history of discovery in the natural environment and in commercial aquaculture facilities; and ecological information. An updated checklist of *Polydora*-complex species from Australia is also included. It is hoped that by being explicit about the knowledge gaps and problems they can be addressed, ultimately providing a solid taxonomic background for further research into the *Polydora*-complex species and resolution of the mudworm problem in Australia.

**Key words:** Mudworm, polydorid, marine pest, oyster disease, estuary, aquaculture, taxonomy

### Introduction

**Australia's first marine pest?** In 1885, William Haswell, lecturer in Zoology and Comparative Anatomy at Sydney University, identified Australia's first marine pest. The animal was found in mud-filled blisters on the inner surface of oyster shells (*Saccostrea glomerata* Gould, 1850) from sub-tidal oyster beds in the Hunter River, New South Wales where oysters were “dying in large numbers owing to the attacks of some parasite” (Haswell 1885). Serious outbreaks of disease leading to death had resulted in the closure of many oyster farms along the NSW coast and into Queensland since the 1860s (Ogburn *et al.* 2007), raising concerns as to the survival of the natural oyster beds and the sustainability of the oyster industry in New South Wales. Haswell cautiously identified the abundant organism in the blisters as *Polydora ciliata* Johnston, 1838 “identical with the European *Polydora ciliata* of Johnston”. He thought this “strange” and noted that reports of *P. ciliata* (as *Leucodore ciliata*) from other parts of Europe (McIntosh 1868) generally did not indicate a “shell-invading habit” and there was no mention of the same amount of destruction as caused by the animal in the Hunter River. Haswell explained the oyster mortalities as relating to poor water quality in the estuary at that time reducing the ability of the oyster to protect itself from the worm parasite. He also described a new species, *P. (L.) polybranchia* (now known as *Boccardia polybranchia* (Haswell, 1885)) from the oyster mud-blister. These “parasites” quickly became known to oyster growers as “mudworms”. Whitelegge (1890) described and illustrated mudblisters and eggs of the mudworm identified as *P. (L.) ciliata* Johnston, 1838 from New South Wales. In his report he included Johnston's (1838) original description of *P. (L.) ciliata* supplemented with additional details and an illustration from McIntosh (1868) who believed that the many *Leucodore* species described from different habitats throughout Europe, United States and Britain were the same animal poorly described by each of their authors. Wilson (1928), having described the eggs and larvae of *P. ciliata* and *P. hoplura* Claparède, 1870, from blisters in oysters from the River Yealm, England, suggested that Whitelegge's illustrations were more like those described by Söderström (1920) of *P. ligni* (now known as *P. cornuta* Bosc, 1802). The identity of the pest was clearly uncertain.