



A revision of *Entobdella* Blainville in Lamarck, 1818, with special emphasis on the nominal (type) species “*Entobdella hippoglossi* (Müller, 1776) Blainville, 1818” (Monogenea: Capsalidae: Entobdellinae) from teleost flatfishes, with descriptions of three new species and a new genus

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Abstract

Species of *Entobdella* Blainville in Lamarck, 1818, from skin (less commonly gills) of teleost flatfishes and occasionally from round-bodied teleosts are reviewed, with special reference to the nominal (type) species “*Entobdella hippoglossi* (Müller, 1776) Blainville, 1818” (Monogenea: Capsalidae: Entobdellinae) and to *E. pugetensis* Robinson, 1961. In the late 20th century the following 5 species were synonymised with *E. hippoglossi*: *E. brattstroemi* Brinkmann, 1952; *E. curvunca* Ronald, 1957; *E. rosaceus* Crane, 1972; *E. squamula* (Heath, 1902) Johnston, 1929; *E. steingroeveri* (Cohn, 1916) Johnston, 1929. We have shown that *E. brattstroemi* and *E. squamula* are valid, *E. curvunca* is a synonym of *E. hippoglossi* and *E. rosaceus* and *E. steingroeveri* are *species inquirendae*. Specimens of *E. steingroeveri*, first described in 1916 by Cohn, have been re-examined. Parasites from the Pacific Ocean on *Hippoglossus stenolepis* Schmidt, 1904 (Pacific halibut) and *Eopsetta jordani* (Lockington, 1879) (Petrale sole) (Pleuronectiformes: Pleuronectidae) and parasites geographically isolated in the Atlantic Ocean on *H. hippoglossus* (Linnaeus, 1758) (Atlantic halibut) and *Reinhardtius hippoglossoides* (Walbaum, 1792) (Greenland halibut) (Pleuronectiformes: Pleuronectidae) have all been regarded as *E. hippoglossi*. We confirm that *E. hippoglossi sensu stricto* is a parasite of the Atlantic halibut, but is accompanied on the same host by a second entobdelline species, *E. vanbenedeni* n. sp. It differs from the type species, *E. hippoglossi* in the anatomy of the distal region of the vagina and in the number, distribution and shape of papillae on the ventral surface of the haptor. Parasites from *H. stenolepis* are morphologically similar to *E. hippoglossi* on *H. hippoglossus* (no second species has been found on *H. stenolepis*), but differences in the number and shapes of haptor papillae support proposal of the parasites from *H. stenolepis* as a distinct species, *E. stenolepis* n. sp. Our anatomical studies of these parasites, with the exception of *E. pugetensis*, have revealed a cluster of several seminal receptacles opening into the ovo-vitelline duct. Previous reports of a single seminal receptacle in *E. stenolepis* (as *E. hippoglossi*) and *E. steingroeveri* are erroneous. Furthermore, reports of the vagina opening proximally into the alleged single seminal receptacle are also incorrect; direct and indirect evidence suggests that in all these parasite species, including *E. pugetensis*, the vagina opens proximally into the vitelline reservoir. *Entobdella squamula* from *Paralichthys californicus* (Ayers, 1859) (California flounder) (Pleuronectiformes: Paralichthyidae) differs from *E. stenolepis*, *E. hippoglossi* and *E. vanbenedeni* in the relative lengths of the accessory sclerites and anterior hamuli. Parasites originally identified as *E. squamula* from *Hippoglossina macrops* Steindachner, 1876 (Bigeye flounder) (Pleuronectiformes: Paralichthyidae), caught off the coast of Chile by the Lund University Chile Expedition (1948 – 49), differ from *E. squamula* in the shapes of the accessory sclerites and are regarded as a new species, *E. brinkmanni* n. sp. *E. aegyptiacus* Amer, 1990 must be regarded as a *species inquirenda*. A key to the 7 valid species of *Entobdella* recognised by us is included. *Entobdella pugetensis* differs in the following ways from all other species of *Entobdella*: the parasite is found on gills (less commonly on skin) of *Atheresthes stomias* (Jordan & Gilbert, 1880) (Arrowtooth flounder) (Pleuronectiformes: Pleuronectidae); the penis sac has a thick, possibly muscular, wall; the vagina is a relatively wide, short, straight tube with a conspicuous opening; no seminal receptacles have been observed; there are no papillae on the ventral surface of the haptor. We regard these distinctions as sufficient to erect a new genus, *Branchobdella* n. gen. to accommodate *B. pugetensis* n. comb. Assimilation of spermatophores in skin-parasitic *Entobdella* spp. and in the gill parasite *B. pugetensis* is discussed.

Key words: Platyhelminthes, Monogenea, Capsalidae, Entobdellinae, *Entobdella brinkmanni* n. sp., *Entobdella hippoglossi sensu stricto*, *Entobdella stenolepis* n. sp., *Entobdella vanbenedeni* n. sp., *Branchobdella* n. gen., *Branchobdella pugetensis* n. comb., teleost flatfishes, sperm exchange

Introduction

Klassen *et al.* (1989) reviewed *Entobdella* Blainville in Lamarck, 1818 and drew attention to the fact that *Entobdella* spp. fell naturally into 2 groups, 1 parasitising teleost flatfishes and the other infecting elasmobranch flatfishes (rays). While appreciating the implication that *Entobdella* should be subdivided, Klassen *et al.* (1989) regarded this inappropriate at the time. The situation was reassessed by Kearn & Whittington (2005) who took into account molecular analyses by Whittington *et al.* (2004) and the transfer of *Entobdella corona* Hargis, 1955 and *E. guberleti* Caballero & Bravo-Hollis, 1962 to the newly proposed *Listrocephalus* Bullard, Payne & Braswell, 2004 by Bullard *et al.* (2004). Kearn & Whittington (2005) erected *Neoentobdella*