

Further studies on the occurrence of freshwater Microturbellaria in the British Isles

II. New Records and an emendation to the existing key for the group

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Summary

Five new British records of freshwater Microturbellaria are illustrated: *Gieysztoria infundibuliformis*, *Castrada lanceola*, *Castrada neocomensis*, *Castrada viridis* and *Strongylostoma elongatum*. These species together with a new species, *Macrostomum johni* described by Young (1972), are woven into the fabric of the existing key for the group (Young, 1970). All six species were recorded from the littoral zone of lakes in Caernarvonshire, N. Wales. The times of the recordings are indicated.

Introduction

The known occurrence and distribution of freshwater Microturbellaria in the British Isles up to 1967 was outlined by Young (1970). A recent survey on the occurrence of these animals in the littoral zone of some British lakes (Young, in prep.) has revealed a new species (Young, 1972) and five new British records. This account lists and illustrates the new records, and includes an addendum to the existing British key on the group (Young, 1970).

Specimens and/or whole mounts and/or squash preparations and/or sectioned material of the species which were found in abundance have been deposited in the British Museum (Natural History) and a complete list of records is stored in the Records Centre of the Nature Conservancy at Monks Wood Experimental Station, Huntingdon.

Methods

Young (1970) describes how Microturbellaria are collected from the field. Briefly, an F.B.A. zooplankton hand-net of 60 meshes/in (approx. 23.6 meshes/cm) is used to sweep through vegetation and to scoop up the surface layers of various substrata. The samples are poured into 3-litre glass jars, left to stagnate in the laboratory, and are frequently examined when any Microturbellaria adhering to the walls of the jar and surface meniscus or swimming in the open water are removed. The animals are examined alive on a slide under a vaselined coverslip, which allows various degrees of compression, by means of a compound microscope.

Whole mounts, unstained or stained with borax-carmin, squash preparations,

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mounted in Canada balsam or polyvinyl lactophenol, and sections, 8 μm thick and stained in Ehrlich's haematoxylin and eosin are desirable to confirm some distinguishing criteria.

Habitats

All the new records were obtained from the littoral zone of upland, calcium-poor, 'unproductive' lakes in Caernarvonshire, N. Wales: Llyn Cwellyn (O.S. 23 560550), Llyn Dinas (O.S. 23 615495), Llyn Gwynant (O.S. 23 645520), Llyn Mymbyr (O.S. 23 710575), Llyn Nantlle (O.S. 23 515530), Llyn Ogwen (O.S. 23 660605). Some physico-chemical features of these lakes are given in Reynoldson (1958). Samples were taken at monthly intervals (August excepted) from November 1968 to October 1969.

New records and existing key emendations

The new British records are now listed. To aid identification their body length and colour, and penis stylet length, where this is an important distinguishing criterion, are

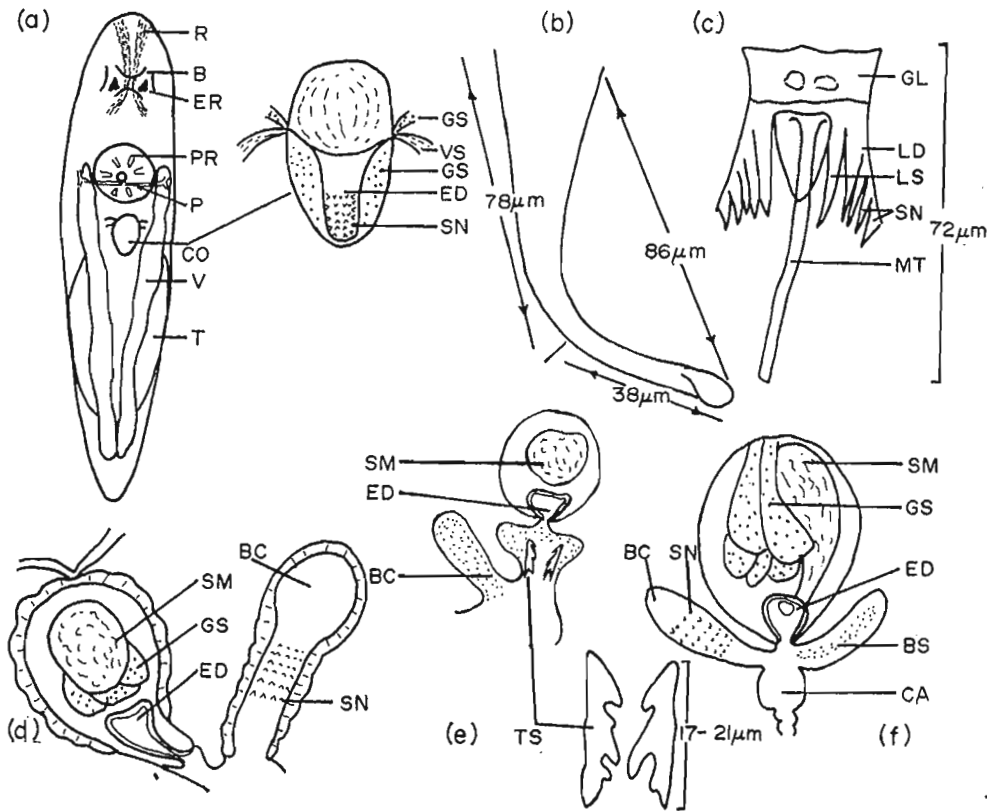


Fig. 1. (a) *Stronglylostoma elongatum* (dorsal view). (b) Penis stylet of *Macrostomum johni* (after Young, 1972). (c) Penis stylet of *Gieysztoria infundibuliformis*. (d) Copulatory apparatus of *Castrada lanceola*. (e) Copulatory apparatus of *Castrada neocomensis*. (f) Copulatory apparatus of *Castrada viridis*. B, brain or cerebral ganglia; BC, bursa copulatrix; BS, blind sac of copulatory atrium; CA, copulatory atrium; CO, copulatory organ; ED, ejaculatory duct; ER, red eyes; GL, girdle; GS, granular secretions; LD, lateral distal branch or end branch; LS, large spine; MT, median tube; P, protonephridial tube; PR, rosulate pharynx; R, rod or rhabdoid track; SM, sperm; SN, spines; T, testes; TS, toothed structure; V, vitellaria or yolk-glands; VS, vesicula seminalis.

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indicated. The places and times (months) of the recordings are also included. After this information the necessary emendation to the existing key for the group (Young, 1970) is made. Reference is repeatedly made to points within this key. *Macrostomum johni*, a new species described by Young (1972), is included for the sake of completeness in the modification of the existing key.

Fig. 1 shows important distinguishing features for the species. Only the penis stylet for *Macrostomum johni* and *Gieysztoria infundibuliformis* and the reproductive organs for the three *Castrada* spp. have been shown as these are the most important distinguishing criteria; the body-shape and internal anatomy of species within each of the three genera are similar and examples can be seen in Young (1970). The entire animal is shown for *Strongylostoma elongatum* though a minimum of organs is included to avoid confusion. The scale of magnification is not constant for all species.

Macrostomum johni Young, 1972

Length up to 1.3 mm; colourless. Extreme measurements of penis stylet, 80–98 μm . Recorded Llyn Cwellyn, December and February.

Key emendation.

At point 4, insert a fourth alternative to *M. rostratum*, *M. distinguendum* and *M. tuba* as follows:

— Penis stylet curved in two planes and 80–90 μm in length; distal end blunt and cowl (hood) shaped; distal opening subterminal (Fig. 1b).....*M. johni*

Gieysztoria infundibuliformis Fuhrm., 1894

Length 0.8–1.0 mm; colour pale to dark brownish-red. Extreme measurements of the penis stylet (in the only two British specimens found), 64–82 μm ; number of spines borne on the lateral distal branches, 2–4/2–4. Recorded Llyn Cwellyn, July, and Llyn Ogwen, July.

Key emendation.

At point 15, in key to *Gieysztoria infundibuliformis*, replace 'pale brownish body' by 'pale brownish or pale to dark brownish-red body'. At point 17 insert a fourth alternative to *G. triquetra*, *G. diadema* and *G. rubra* as follows:

— Penis stylet 64–82 μm high, with two to four spines on each lateral distal branch, and with a long median tube with one larger spine on either side (Fig. 1c)

G. infundibuliformis

Castrada lanceola M. Braun, 1885

Length up to 3.5 mm; pale greyish/yellowish colour. Recorded Llyn Cwellyn, February.

Castrada neocomensis Volz, 1898

Length up to 1.5 mm; green with zoochlorellae. Length of toothed structure in copulatory atrium varied from 15–25 μm in the specimens studied. Recorded, Llyn Dinas, Llyn Gwynant, Llyn Mymbyr, and Llyn Ogwen. May, June, July, September.

Castrada viridis Volz, 1898

Length 0.5–0.6 mm; green with zoochlorellae. Recorded Llyn Cwellyn, Llyn Dinas, Llyn Gwynant, Llyn Mymbyr, Llyn Nantlle and Llyn Ogwen. All months of year (except August when no samples were taken from the lakes).

Key emendation for three *Castrada* spp.

At point 21 replace key to *Castrada* species with:

— Copulatory atrium and bursa copulatrix present (very small in *C. luteola*).

Testes extend anterior to (*C. armata*, *C. lanceola* and *C. luteola*) or lie at the side of the pharynx (*C. neocomensis* and *C. viridis*). Body white/yellowish (*C. luteola* and *C. armata*—though this species sometimes tinged green), or pale greyish/yellowish (*C. lanceola*), or green with zoochlorellae (*C. neocomensis* and *C. viridis*).....*Castrada* spp.

At point 22 replace alternatives with:

- 22. Copulatory atrium relatively narrow without blind sacs; bursa copulatrix with bespined stalk. Large species up to 3.5 mm in length; pale greyish/yellowish (Fig. 1d).....*C. lanceola*
- Copulatory atrium with one or two bespined blind sacs (as well as a bursa copulatrix). Smaller species up to 1.5 mm in length; white/yellowish or green.....22A
- 22A. Ductus ejaculatorius simple and not forked into two branches.....22B
- Ductus ejaculatorius proximally double with the two branches uniting distally22C
- 22B. Copulatory atrium with two large toothed structures of complicated form (not distinct hooks as found in the blind sacs of *C. armata*). Green (Fig. 1e)
C. neocomensis
- Copulatory atrium without such structures. Green (Fig. 1f).....*C. viridis*
- 22C. With one hook in each of the two blind sacs. White/yellow (sometimes tinged green) (see Young, 1970).....*C. armata*
- Without hooks in the two blind sacs. White/yellowish (see Young, 1970) *C. luteola*

Strongylostoma elongatum Hofsten, 1907

Length 0.9–1.5 mm; yellowish/grey reddish/dark brown; oil droplets and dark concretions sometimes present. Recorded Llyn Cwellyn, Llyn Dinas, Llyn Ogwen. June, July, September, October, November. The animals were of the sub-species *S. elongatum elongatum* Hofsten 1907 as the spines in the ductus ejaculatorius in the specimens studied measured 1–5 μm (see, Luther, 1963).

Key emendation.

Replace couplet at point 25 with:

- 25. Testes ventral to the yolk-glands. Eyes reddish. Body reddish or yellowish/grey reddish/dark brown; oil droplets and dark concretions may be present
Strongylostoma spp. 25A
- Testes dorsal to the yolk-glands. Eyes dark. Body yellowish, brownish or dark brown/black26
- 25A. Ductus ejaculatorius in whole length bespined. Anterior tip of body slightly spatulate or fan-shaped (not so distinct in female phase of this protandrous species). Body reddish with yellow and red oil droplets in gut and parenchyma (see Young, 1970).....*S. radiatum*
- Ductus ejaculatorius in distal part only bespined. Anterior end of body not widened. Body yellowish/grey reddish/dark brown; oil droplets and dark concretions can be present (Fig. 1a).....*S. elongatum*

Acknowledgments

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