

THE EXOTIC WORM *BRANCHIURA SOWERBYI* BEDDARD (OLIGOCHAETA, TUBIFICIDAE) RECORDED IN NEW FOREST WATERS.

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Introduction

The exotic oligochaete worm, *Branchiura sowerbyi* Beddard has been recorded from several locations in England including heated water tanks, rivers and canals (Brinkhurst 1963; Aston 1968; Macan 1974) and is particularly associated with warm water discharges from power stations in temperate waters in Europe and North America (Aston 1968; Langford 1983, 1990). The species is one of the largest of the Tubificidae and is characterised by a striking fringe of gill filaments along the posterior segments. It is believed to have been introduced to Britain from south-east Asia with soil attached to tropical aquatic plants probably in the late 18th or early 19th century, though some authorities suggest that the species may be indigenous in parts of Europe (Aston 1968).

Studies of the species in both unheated and heated waters in Britain have shown that it had a one-year life cycle irrespective of the temperature regime and that reproduction began in late spring when water temperatures exceeded 15°C (Aston 1968). Growth of sexually mature worms was fastest at 10°C in the unheated waters and 15°C in the heated waters but the optimum temperature for growth of immature worms was found to be 30°C. The optimum temperature for reproduction was 25°C. Because of its large size and its temperature optima, Aston and Milner (1982) suggested, after experiments, that *B. sowerbyi* could be cultured as a food for fish using waste organic material as a substrate in the heated waters from power stations.

Methods and New Forest Records

Since 1992, a detailed study of the invertebrate fauna of New Forest streams has been in progress

(Langford 1996). Collections have been made from various sub-habitats, and substrates including midstream, marginal, in-stream weed and timber debris. To date records of species and communities are available from 102 sites covering all the main catchments and including very small headwater streams and drainage ditches. In addition, various studies have been made as part of student projects in ponds and pools within the boundaries of the New Forest heritage area. Samples have been taken at all locations with a standard 0.9 mm mesh hand-net and sorted under $\times 2$ magnification.

In 1997, specimens of *B. sowerbyi* were recorded from samples taken in Eyeworth Pond near Fritham (SU 2281 1460) and the ornamental pond at Elmers Court near Lymington (SZ 3365 9565). In the summer of 1997 further specimens were also collected in the outflow stream from Sowley Pond, alongside Sowley House (SZ 9660 3785). The specimens from Eyeworth and from Elmers Court were small and the tail 'gill fringes' damaged to some extent. The Sowley specimens were larger, up to 5 cm long, and the gills very obvious and well developed. So far collections have not been made in Sowley pond itself but it seems clear that the main population probably exists in the pond.

Discussion and Conclusions

No detailed temperature records exist for either of the ponds but temperatures in the Sowley inflow stream are known to exceed 15°C in most years (Environment Agency Data). Records from other streams suggest that maximal temperatures in unshaded streams can exceed 20°C in warm summers and it seems likely that ponds and pools

reach similar temperatures. Winter water temperatures rarely reach 0°C for long periods though both streams and standing waters freeze over for short periods in colder winters (Tubbs 1986; Langford 1996). Temperatures suitable for the reproduction of *B. sowerbyi* occur in most years, often for several weeks.

The date of introduction of the worms is not known. All three ponds are artificial. Eyeworth was created to supply the Fritham gunpowder works with water probably in the 19th century. Sowley pond was used as a water supply and hydrostatic head pond for the mill and drop forge which supplied ironwork to the shipbuilding industry at Bucklers Hard, probably in the late 17th or early 18th century and the pond at Elmers Court was created as a decorative feature in the 19th or early 20th century. The ponds contain water lilies, which were no doubt introduced at

various times, probably carrying specimens or eggs of *B. sowerbyi*.

The New Forest is relatively warm and wet for Britain with a moderate climate. With the amenable temperature range and the numerous artificial ponds and lakes it is highly likely that *B. sowerbyi* occurs in many other locations in the region, both on the New Forest and outside it. Studies of both running and static waters within the New Forest heritage area are continuing.

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REFERENCES

- Aston, R J 1968 The effect of temperature on the life cycle, growth and fecundity of *Branchiura sowerbyi* (Oligochaeta, Tubificidae) *J Zool London* 154 29–40.
- & Milner A G P 1981/1982 Conditions required for the culture of *Branchiura sowerbyi* (Oligochaeta, Tubificidae) in activated sludge *Aquaculture* 26 155–160.
- Brinkhurst R O 1963 *A Guide for the Identification of British Aquatic Oligochaeta*, (Freshwater Biol Assoc Sci Pub 22), Ambleside.
- Langford, T E 1983 *Electricity Generation and the Ecology of Natural Waters*, Liverpool University Press.
- 1990 *Ecological Effects of Thermal Discharges*, London: Elsevier Applied Science, Pollution Monitoring Series.
- 1996 Ecological aspects of New Forest streams, draining one of Britain's unique areas *Freshwater Forum* 6 2–38.
- Macan, T T 1974 Freshwater Invertebrates, in Hawkesworth, D L (ed), *The Changing Flora and Fauna of Britain*, London and New York: Academic Press, 143–155.
- Tubbs, C R 1986 *The New Forest*, London: Collins, The New Naturalist Series.

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