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A note on the recovery of Thoracochaeta zosterae (Haliday) (Diptera: Sphaeroceridae) from archaeological deposits

Robert Belshau; *

Thoracochaeta (formerly Leptocera) zosterae (Haliday) is a small fly which may be found today in Britain, and elsewhere in the Holarctic region, breeding within wet decaying seaweed cast up on the shore at the high water mark, often forming large populations. It is only rarely found inland (Pitkin 1988). Given its modern distribution, it is surprising that this was the most commonly encountered, and the most abundant, species recovered from a number of archaeological deposits in London (Belshaw 1987). The contexts in which it was present were waterlogged pit-fills, their dates ranging from Saxon to 18th century. T._ zosterae puparia were recovered from a total of twelve distinct contexts from seven sites.

A puparium of J_._ zosterae is shown in Fig. 7, the specimen having been recovered from a 12th century pit-fill in Moorgate, London. Illustrations of the puparium are given by Egglishaw (1961) and Richards (1930).

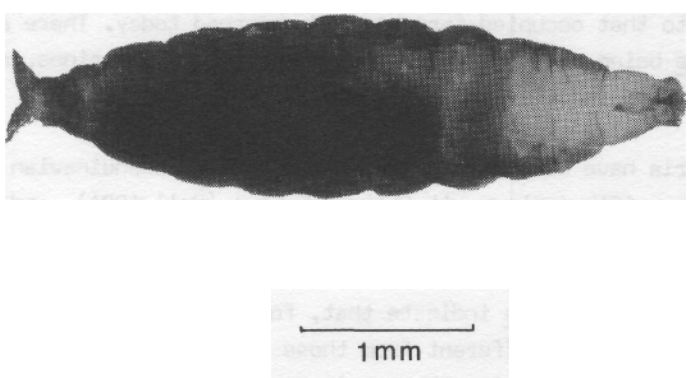

Figure 7. Puparium of Thoracochaeta zosterae, ventral view.

Other organic remains recovered indicated that many of these deposits were likely to have been cesspit-fills. These included the seeds of fruits likely to have been consumed whole (e.g. fig, Ficus carica L.), human gut parasite eggs, small bone fragments with

* Robert Belshaw, Diptera Section, Department of Entomology, British Museum (Natural History), Cromwell Road, London SW7 5BD, U.K.

evidence of corrosion, possibly caused by digestive processes, and the puparia of fly species which today breed in such environments (e.g. Fannia scalaris (Fabricius) and the sepsid Themira putris (L.)). There was evidence, such as larger bone fragments and the puparia of a number of muscid and sphaerocerid flies, that some deposits also contained more general household and garden refuse.

At the present time, fucoid seaweeds are not found as far up the Thames as London (Tittley and Price 1977). Although in the past seaweed was commonly collected and used as fertiliser in areas near to the coast, there appears to be no evidence indicating that it was widely used within towns. It is also significant that no remains of other organisms usually found on the seashore were recovered from the archaeological deposits examined. J_._ zosterae larvae may have been present in other refuse later dumped into the pits, but this is perhaps unlikely as it is not today present in refuse, a habitat which is still quite common.

In some deposits the concentration of T^ zosterae puparia was very high. One 250 g sample contained at least 432 individuals, indicating that the larvae were probably

present in the pit during, or prior to, the period of deposit formation. Today the species appears normally to develop in a wet, saline environment. In the laboratory, Egglishaw (1961) found that the larvae preferred wet conditions, especially the early stages, which could completely immerse themselves for brief periods to feed. The larvae are probably filter feeders (Marshall 1982). Although pupation usually occurs in the sand underneath the decaying seaweed, puparia may also be found in the drier upper layers of the wrack. This is where pupation occurs when the species is reared in glass containers.

One possibility is that T^ zosterae was pre-adapted to exploit a new niche created by one of man's waste disposal techniques, the cesspit. This new habitat would also presumably have been of a semi-fluid consistency and with a high concentration of salts derived from the urine present. When this habitat became rarer, the range of the species may have contracted to that occupied formerly and observed today. There are, however, no records of J_._ zosterae being recovered from modern cesspits or latrines, and its presence in archaeological deposits remains enigmatic.

T^ zosterae puparia have also been recovered from Anglo-Scandinavian deposits in York (J. Phipps in litt.), a 16th century pit-fill in Exeter (Bell 1984), and an 18th century cave-fill in Nottingham (observed by the author).

These records of T^ zosterae indicate that, for whatever reason, the species was present in environments very different from those in which it occurs today. They are perhaps of interest when considering the use in environmental reconstruction of direct extrapolation from the modern habitats of insects. A similar phenomenon, this time in the Coleoptera, has been remarked upon by Hall et al. (1983, 81). The most abundant ptiliid beetle at the Lloyds Bank site, 6-8 Pavement, York, in deposits believed on various evidence to be Anglo-Scandinavian floors, was the seaweed-inhabiting species Ptenidium punctatum (Gyllenhal).

T_._ zosterae puparia have in the past been confused with those of Teichomyza fusca Macquart. Until recently, the reference material of J_._ zosterae puparia at the British Museum (Natural History), from the 1954 Temple of Mithras excavation in London, was mislabelled as J_._ fusca (Pitkin pers. comrn.). The puparia of T_._ fusca are larger and quite distinct. This ephydrid used commonly to be found breeding in cesspits and latrines until such habitats became rare in this country. The reference to it also breeding on the shore

by Smith (1986), taken from Walker (1853), is possibly incorrect, as several other studies do not mention it. Puparia of J_._ fusca have also been reported from archaeological deposits (Girling 1984; Greig 1982). Oldroyd (1964) also mentions recovering the larval stage from medieval woodwork in London.

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