OBSERVATIONS ON AN ANNUAL MIGRATION OF *BATHYPOREIA PELAGICA* (AMPHIPODA, HAUSTORIIDAE)

BY

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INTRODUCTION

The intertidal distribution of members of the haustoriid amphipod genus *Bathyporeia* is well documented (Watkin, 1942; Colman & Segrove, 1955; Salvat, 1967; Fish & Preece, 1970). *Bathyporeia pilosa* Lindström and *B. pelagica* (Bate) are common on the west coast of Wales where the former is found on sheltered beaches between the levels of mean high water spring tides (MHWS) and mean tide level (MTL). *B. pelagica* is predominantly found at MTL and below on more exposed open coast beaches, being less tolerant of low salinity than *B. pilosa* (cf. Preece, 1970). During investigations into the reproductive patterns of these two species it was observed that while *B. pilosa* remained in high densities on a sheltered estuarine beach throughout the year, *B. pelagica* was present at this locality only during the late autumn and winter (Fish & Preece, 1970). This behaviour pattern was first observed in 1967 and it has been recorded in each subsequent year, the animals appearing in the estuary during September or October and disappearing the following April or May. While migrations down the shore during spring and summer are common in *Bathyporeia* spp. (Salvat, 1967; Fish & Preece, 1970; Ladle, 1975), and are most probably related to the harsh environmental conditions at high beach levels, there are no published records of a horizontal migration of *B. pelagica*. This paper describes the annual migration of *B. pelagica* into the Dovey estuary during the winter months; the population structure, reproduction and brood size of the migrating animals are compared with a permanent population of the same species on a neighbouring open coast beach.

MATERIALS AND METHODS

The Dovey estuary on the west coast of Wales (52°33'N 4°00'W), shows pronounced tidal domination (Haynes & Dobson, 1969) and drains completely at low tide. Samples were taken from October 1973 to May 1974 from the open coast and estuarine beaches shown in fig. 1. Details of interstitial and tidal salinities have been given for both localities by Preece (1970), and the median particle diameter of the sediment and organic carbon values are given in table 1. Organic carbon was measured by the wet oxidation method of Walkely and Black as described by Piper (1947) with the use of silver sulphate to overcome chloride inter-
Sediment characteristics of open coast and estuarine sampling stations

<table>
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<th>Open Coast</th>
<th>Estuary</th>
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<td>Median particle diameter (μm)</td>
<td>250</td>
<td>230</td>
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<tr>
<td>% organic carbon (± S.D.)</td>
<td>0.024 ± 0.006</td>
<td>0.070 ± 0.03</td>
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ference. On both beaches samples of sediment were taken to a depth of 10 cm at approximately 2.0 m above Chart Datum (just below mean tide level) and the amphipods were removed by passing the sediment through a 0.5 mm mesh sieve. Population structure was investigated by recording body length which was measured from the anterior margin of the first segment of the antennule to the base of the two setae arching the dorsal depression of pleon segment four. The relationship between this measurement and total body length is given by Fish (1975). Levels of reproduction of the two species were assessed by recording the percentage of gravid females in each sample and direct counts were made of the number of eggs in each brood. A linear relationship exists between body length and brood size (Fish, 1975).

Fig. 1. Map of the Dovey estuary, Wales showing the location of the open coast (A) and estuarine sampling stations (B).