More than fifty years ago, Elofson (1941) showed that it is fully possible to maintain living cultures of marine ostracods in aquaria. He concentrated on determining the generation length of several species. In this study, we provide some preliminary observations on the mode of life and morphological variations of marine ostracods kept in aquaria. They derive from a water depth of 40 m in the Gullmar Fjord (58°17’N and 11°29’E), west coast of Sweden. The dominant species are Kriikhe praetexta praetexta (Sars, 1866) and Sarsiyytheridea bradii (Norman, 1865). Other species housed in the aquaria are: Jonesia acuminata (Norman, 1865), Palmoconcha guttata (Norman, 1865), Palmoconcha laevata (Norman, 1865), Cytheropteron laotissimum (Norman, 1865), Pterygoconcha praetexta (Hershkovitz, 1880), Acanthocythere danaei (Norman, 1865), Robertsoniella tuberculatus (Sars, 1866), Elosynella concinna (Jones, 1857) and Argilloecia conoidea (Sars, 1923).

MATERIAL AND METHODS

The study was carried out at the Kristineberg Marine Research Station, west coast of Sweden, from July 1992 to June of 1994. Sediment from a water depth of 40 m in the Gullmar Fjord was sieved to remove thin layers which were sieved through 250 and 125 μm. After thawing to constitute a 10-20 mm thick sediment layer in two 50 l aquaria, they were maintained in a continuously flowing, open system, pumping water from the intermediate watermass (40 m to 520 m) to the surface (520 m). A siphon was passed over the sediment surface within the aquaria to collect planktonic plankton, including large feeding ostracods. The intensity of bioturbation may also influence the oxygen penetration and oxygen content of the sediment which may allow a greater penetration of oxygen. The oxygen penetration may be influenced by the vertical distribution of species in the sediment. A juvenile, infusional plankton was inevitably emplaced alongside the ostracods at the beginning of the experiment, which together with a supply of pelagic larvae through the pumping system have developed into an actively bioturbating fauna during the course of the experiment. Infusional burrowing polychaetes (mostly Diplocirrus glaucus) were common.

RESULTS AND OBSERVATIONS

Notes on reproduction and ontogenetic development. Most individuals of S. bradii, K. praetexta praetexta, A. conoidea and J. acuminata were juveniles (A-1 to A-4) at the end of the experiment. We also recorded living juveniles A-2 and A-1 of R. tuberculatus and A. danaei, respectively. This implies that ostracods moult, grow and reproduce in the aquaria. Elofson (1941) estimated the total lifespan for S. bradii, R. tuberculatus and A. danaei to be 2–3 years. The generation length of K. praetexta praetexta is unknown. Our infrequent sampling is insufficient for such estimates, although the many juveniles of this species in June 1994 could hardly have remained unchanged since July 1992. The population density (> 1000 specimens per m²) and species composition of living ostracods at the end of the experiment were similar to the natural environment at 40 m in the fjord.

Size variation. The mean length and height of the left valve (LV) of two adult females of K. praetexta praetexta recorded living after 22 months in the aquaria (in May–June 1994) are 675 (±32.3) and 360 (±66.9) μm, respectively. The corresponding values for three adult males are 675 and 323 (±95) μm, respectively. These dimensions are significantly smaller than those of adult specimens obtained from dredge samples of May 1988 (McKenzie et al., 1989), and April and July of 1992. The mean length and height of the LV of adult females from this database (N = 77) are 779 (±5.1; 95% confidence interval) and 400 (±6.9) μm, respectively. The corresponding values for males (N = 38) are 772 (±3.3) and 359 (±4.6) μm, respectively. A few living adults of R. tuberculatus and P. guttata, respectively, after 22 months in the aquaria were also significantly smaller in average than specimens of the dredge sample of July 1992. A corresponding size reduction was not observed in S. bradii.

DISCUSSION

The oxygen penetration rarely exceeds 10 mm in sandy shallow water sediments (Revsbech et al., 1986; Rasmussen & Jørgensen, 1992). It is dependent on the porosity of the sediment, the diffusion coefficient of oxygen in the sediment and the oxygen concentration at the sediment surface; there is also an inverse relationship between oxygen penetration and oxygen consumption in the sediment (Revsbech & Jørgensen, 1986). Representatives of K. praetexta praetexta and S. bradii were found at depths >10 mm in the sediment of the aquaria. This could be explained by the high porosity (water content) of the sediment which may allow a greater penetration of oxygen. The intensity of bioturbation may also influence the oxygen penetration and the vertical distribution of species in the sediment. A juvenile, infusional plankton was inevitably emplaced alongside the ostracods at the beginning of the experiment, which together with a supply of pelagic larvae through the pumping system have developed into an actively bioturbating fauna during the course of the experiment. Infusional burrowing polychaetes (mostly Diplocirrus glaucus) were common.

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Preliminary observations on living Kriikhe praetexta praetexta (Sars, 1866), Sarsiyytheridea bradii (Norman, 1865) and other marine ostracods in aquaria

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