

**Figs. 2-4.** Hard parts of *Gyrodactylus* species from the fins and body surface of puffers of the genus *Takifugu*. 2, *Gyrodactylus rubripedis* sp. n. from tiger puffer, *Takifugu rubripes*; 3, *Gyrodactylus pardalidis* sp. n. from *Takifugu pardalis*; 4, *Gyrodactylus pardalidis* sp. n. from *Takifugu poecilonotus*. a, hamuli and bars; b, marginal hooks; c, male copulatory organ. Left scale for a and c, 20  $\mu$ m; right scale for b, 10  $\mu$ m.



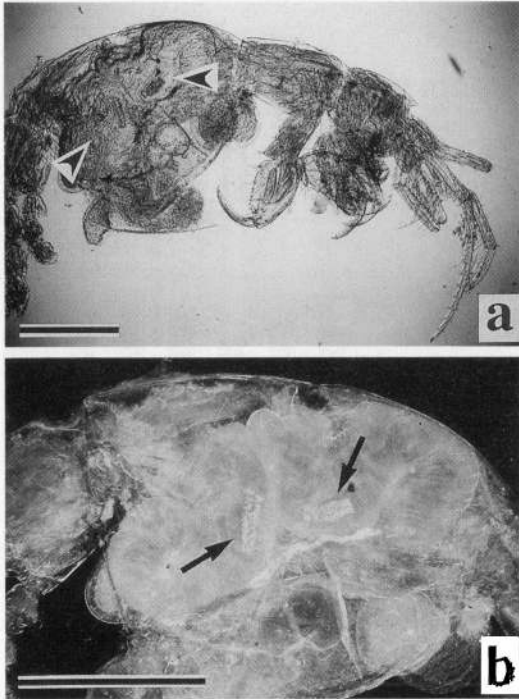


Fig. 6. Amphipod, *Caprella acutifrons*, found in the intestine of tiger puffer. a, major part of body of the amphipod with two cystacanth larvae (arrowheads) of *Longicollum pagrosomi* in the body cavity; b, enlargement of a, taken under dark-field illumination. Probosci are indicated by arrows. Scale, 1 mm.

#### 4. *Heterobothrium okamotoi*

This monogenean was first recovered on the gills in Nov. 1986, about 5 months after introduction of the puffers to the farm, and found also on the branchial cavity wall in Jan, 1987. The prevalence of infection stayed high (75–100%) until the end of the survey. Parasites on the gills were always immature, while those on the branchial cavity wall were mostly adult. There was no correlation between the number of parasites on the two habitats of the host (data not shown). The highest number of parasites per fish was 56.

#### 5. *Longicollum pagrosomi*

In one of the three fish infected with the acanthocephalan in the preliminary survey in July 1986, the amphipod, *Caprella acutifrons*, containing two cystacanth stage larvae of *L. pagrosomi* in the body cavity, was found in the intestine (Fig. 6a, b). It was demonstrated that the amphipod acts as an intermediate

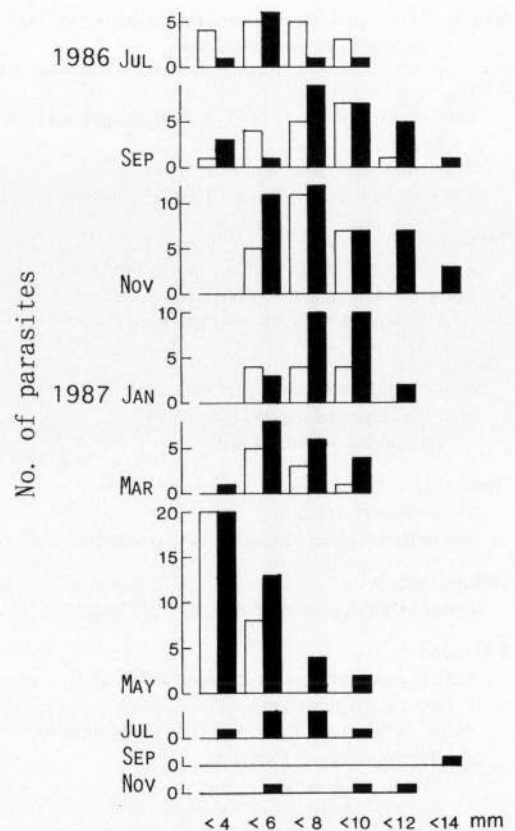


Fig. 7. Seasonal changes in frequency distribution of body length of *Longicollum pagrosomi* from the rectum of tiger puffer. White and black bars represent male and female specimens, respectively.

host for the acanthocephalan.

Seasonal succession of the frequency distribution of parasite body length (Fig. 7) suggests that the parasite has a one-year life cycle and that invades the fish in summer. Largest worm measured 12.8 mm long, and only a few fully formed eggs were observed in the female body cavity.

#### 6. *Neobrachiella hugu*

This species was a very common parasite, and found throughout the survey period. The mean intensity of infection stayed low (0.4–2.8) in the first year, but it rose to 5.6–6.7 from July to November in the second year. No clear seasonal change was noticed in the prevalence of adults with egg sacs or of immature forms. These results suggest that copepodids, the infective stage



