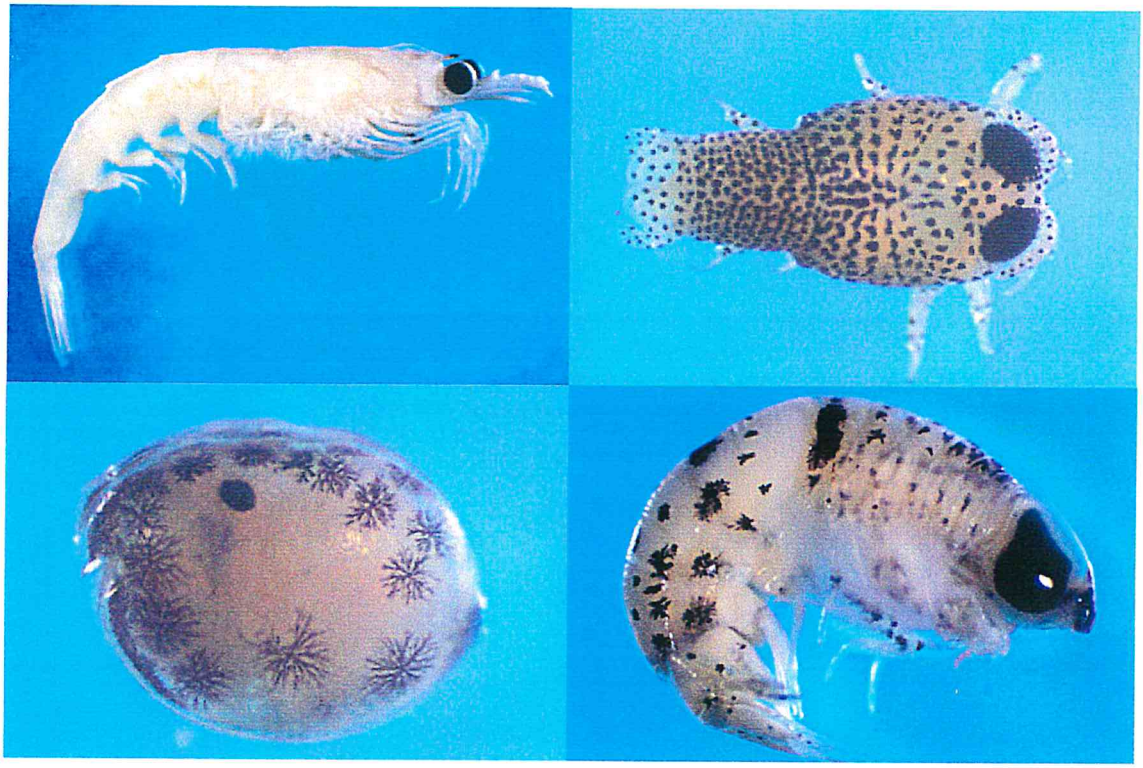
MARINE MANAGEMENT SUPPORT:
NINGALOO MARINE PARK & WEST PILBARA OFFSHORE

A CATALOGUE OF MACROZOOPLANKTON AND NEKTON FROM THE SOUTHERN NORTH WEST SHELF, WESTERN AUSTRALIA

Data Report: MMS/NIN,PIO/NIN,WPO-47/2001



Prepared by Wilson, S.G.
University of Western Australia

November 2001.

DEPARTMENT OF
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Marine Conservation Branch
Department of Conservation and Land Management
47 Henry Street, Fremantle
Western Australia 6160

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Marine Conservation Branch
Department of Conservation and Land Management
47 Henry St., Fremantle, Western Australia, 6160
Ph: 61-8-9432 5100; Fax: 61-8-9430 5408

A catalogue of macrozooplankton and nekton from the southern North West Shelf, Western Australia

Abstract

A taxonomic list and photographic record of 313 macrozooplankton and nekton taxa captured on the southern North West Shelf is presented. Specimens were collected using light traps deployed at the surface and at depth along two cross-shelf transects and one long-shore transect during the summer months of 1997/98 and 1998/99.

Background and discussion

The North West Shelf (NWS) supports Australia's greatest zooplankton biomass (Tranter, 1962) and represents one of the country's most productive fishing areas (Sainsbury, 1979). Large zooplankton feeders, notably whale sharks, *Rhincodon typus* (Smith, 1828), manta rays, *Manta birostris* (Donndorff, 1798), and humpback whales, *Megaptera novaeangliae* (Borowski, 1781), seasonally aggregate on the southern NWS (Taylor, 1994) and form the basis of a burgeoning eco-tourism industry (Colman, 1997). This region is also the site of a well-established offshore oil and gas industry.

Despite their importance to the ecology and economy of the region, our understanding of NWS zooplankton has resulted largely from broadscale surveys conducted by CSIRO in the early 1960s (see Tranter, 1977 and other references in the same journal issue). In recent years, however, a major multidisciplinary project has been undertaken by the Australian Institute of Marine Science (AIMS) to examine the physical, chemical and biological oceanography of the region.

A key component of this study was an intensive, fine scale survey of fishes and invertebrates conducted during the summer months (October to February) of 1997/98 and 1998/99. Light traps were utilised as a sampling technique to selectively target the larger, more mobile components of the zooplankton capable of avoiding towed plankton nets (see Wilson *et al.*, submitted). Two light trap designs were deployed in 1997/98, a larger, three-chamber trap and a smaller, single-chamber design (Figure 1; Meekan *et al.*, 2001). Both traps were based on the original design of Doherty (1987). In 1998/99, only small traps were used. One cross-shelf transect (stations EA to EH) was sampled in the first summer, and two cross-shelf transects (stations EA to EH and TA to TD) and one long-shore transect (stations NE1 to NE6) in the second summer (Figure 2).

Commencing after sunset, light traps were deployed at the surface and at depth (3 m off the bottom to a maximum depth of 75 m) and allowed to drift freely with the current for approximately one hour. Catches were then removed from the traps and immediately preserved in 100% ethanol. In the laboratory, a total of 426 samples were sorted and enumerated on a gridded sorting tray. Approximately 2,200,000 macrozooplankton were collected over the two summers, the most abundant taxa being amphipods (41.1%), euphausiids (34.6%), copepods (6.9%), mysids (4.7%) and cumaceans (4.7%). Wilson *et al.* (submitted) analyse spatial and temporal patterns in the distribution and abundance of the 14 most abundant taxonomic groups.

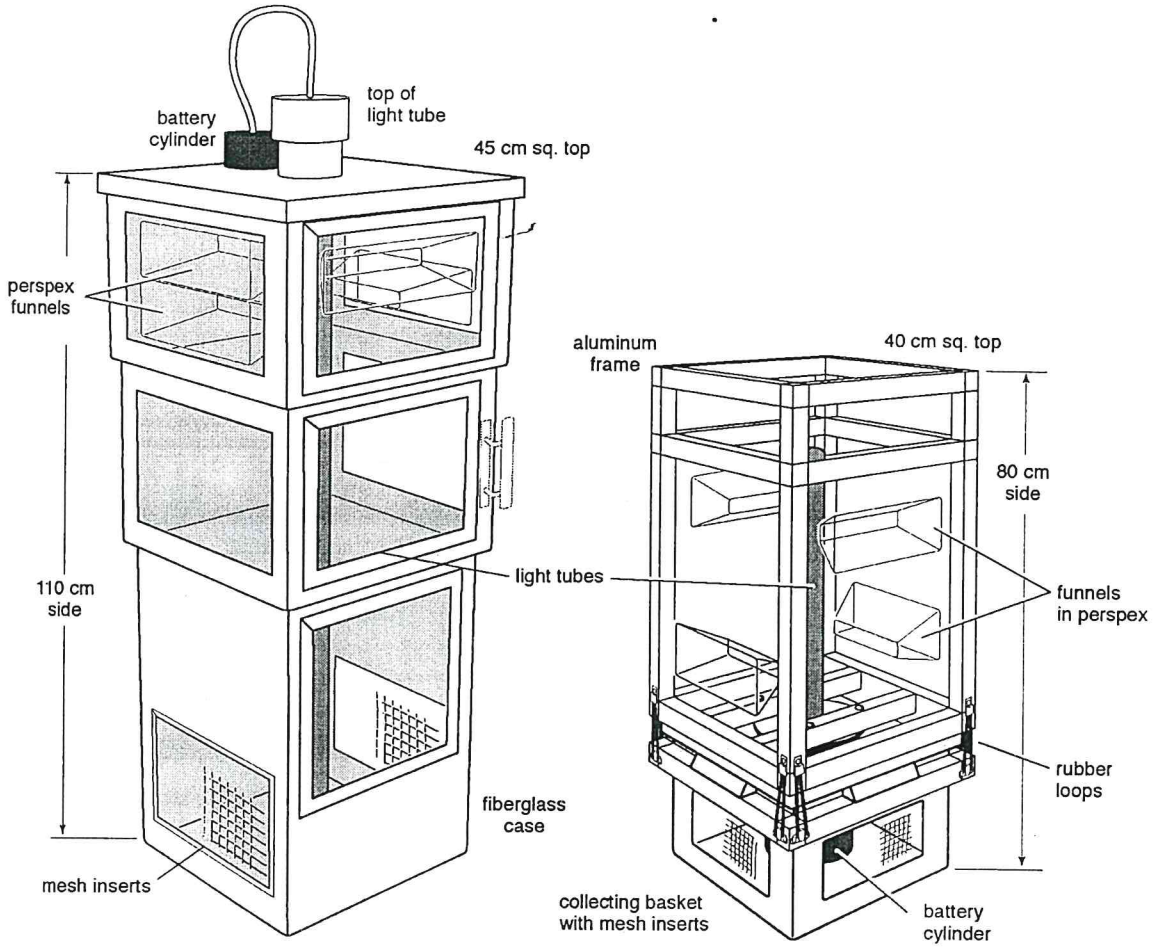


Figure 1. Large and small light trap designs.

Specimens of all new taxa were placed into a voucher collection and photographed against a blue background while submerged in 100% ethanol using an Olympus DP10 digital camera on an Olympus SZH stereo microscope. A total of 313 specimens were archived representing 5 separate phyla. Of these, 63 have been identified to species level, including two new records from Australian waters: the hyperiid amphipods *Schizoscelus ornatus* (Claus, 1879) and *Streetsia palmaspinosa* (Vinogradov, 1990). Here, I provide a taxonomic list of all macrozooplankton and nekton captured in this study and present a photographic record of the voucher specimens. With the exception of the amphipods, which are deposited in the South Australian Museum, this collection and all samples will be deposited in the Western Australian Museum.

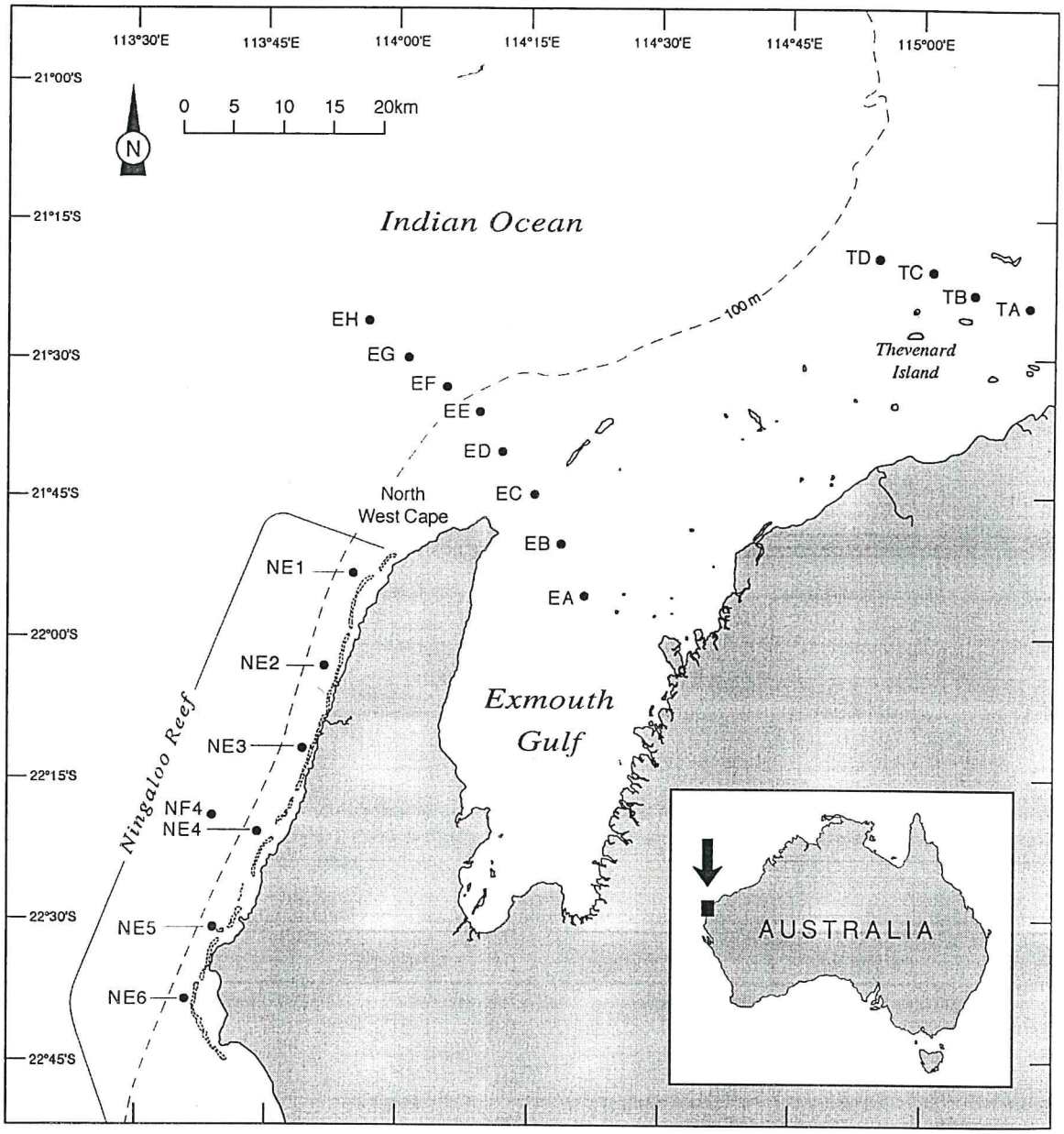


Figure 2. Location map of light trap sampling stations on the southern NWS.

List of macrozooplankton and nekton

	Plate no.
Phylum Echinodermata	1
Phylum Annelida	
Class Polychaeta	2-28
Phylum Chaetognatha	29-35
Phylum Mollusca	
Class Gastropoda	
Subclass Prosobranchia	
Phillipia sp.	36
Atlanta sp.	37
Unidentified	38-42
Subclass Opisthobranchia	
Order Thecosomata	
Cavolinia gibbosa (d'Orbigny, 1835)	43
Diacria trispinosa (Blainville, 1821)	44
Phylum Arthropoda	
Class Copepoda	45-54
Class Ostracoda	55-61
Class Malacostraca	
Order Amphipoda	
Suborder Gammarideae	
Family Ampeliscidae	62-64
Family Dexaminidae	65
Family Lysianassidae	66-68
Family Phoxocephalidae	69
Family Synopidae	
Tyron sp.	70
Unidentified	71
Suborder Hyperiidea	
Family Vibiliidae	
Vibilia chuni (Behning and Woltereck, 1912)	72
Vibilia viatrix (Bovallius, 1887)	73
Family Hyperiidae	
Hyperoche mediteranea (Senna, 1908)	74
Hyperietta stephenseni (Bowman, 1973)	75
Hyperietta vosseleri (Stebbing, 1908)	76
Lestrigonus ducrayi (Zeidler, 1992)	77-78
Lestrigonus macrophthalmus (Vosseler, 1901)	79
Lestrigonus sp.	80
Family Phronimida	
Phronima pacifica (Streets, 1877)	81

Acknowledgements

I thank all those involved in the NWS project, particularly Peter Doherty, Mark Meekan, Dave McKinnon, Miles Furnas and the crew of RV *Lady Basten*. I am also grateful to those who identified selected taxonomic groups of this collection: Fred Wells (gastropods), Wolfgang Zeidler (amphipods), John Carleton (mysids) and John Kitchener (euphausiids). Laboratory space and financial support were generously provided the Department of Zoology, The University of Western Australia. Daniel Heald and Heather McLetchie kindly provided assistance in the laboratory. Production and curation of this report was enabled through the resources of the Marine Conservation Branch (MCB) of the Department of Conservation and Land Management, and Kevin Bancroft and Judy Davidson are thanked for their help in this.

References

Colman, J. (1997). Whale shark interaction management, with particular reference to Ningaloo Marine Park: 1997-2007. Western Australian Department of Conservation and Land Management, Western Australian Wildlife Management Program No. 27. 63 pp.

Doherty, P.J. (1987). Light-traps: selective but useful devices for quantifying the distributions and abundances of larval fishes. *Bulletin of Marine Science* **41**: 423-431.

Meekan, M.G., Wilson, S.G., Halford, A. and Retzel, A. (2001). A comparison of catches of fishes and invertebrates by two light trap designs in tropical NW Australia. *Marine Biology*

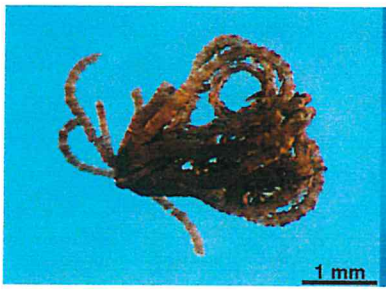
Sainsbury, K.J. (1979). CSIRO defining fish stocks on NW shelf. *Australian Fisheries* **38**, 4-13

Taylor, G. (1994). *Whale sharks: the giants of Ningaloo Reef.* Angus & Robertson, Sydney, 176 pp.

Tranter, D.J. (1962). Zooplankton abundance in Australasian waters. *Australian Journal of Marine and Freshwater Research* **13**, 106-142.

Tranter, D.J. (1977). Further studies of plankton ecosystems in the eastern Indian Ocean. 1. Introduction - the study and study area. *Australian Journal of Marine and Freshwater Research* **28**: 529-539.

Wilson, S.G., Carleton, J.H. and Meekan, M.G. (submitted). Spatial and temporal patterns in the distribution and abundance of macrozooplankton on the southern North West Shelf, Western Australia. *Estuarine, Coastal and Shelf Science*



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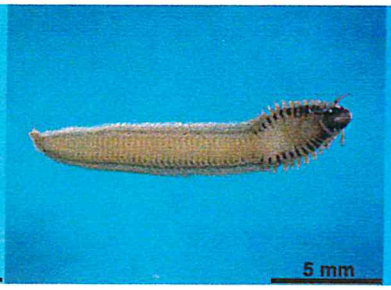

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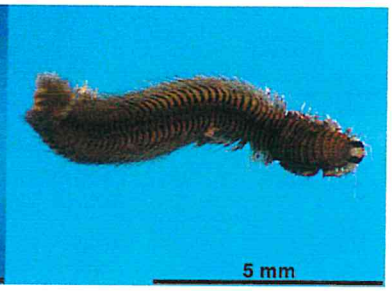

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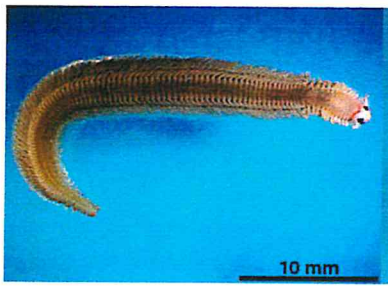

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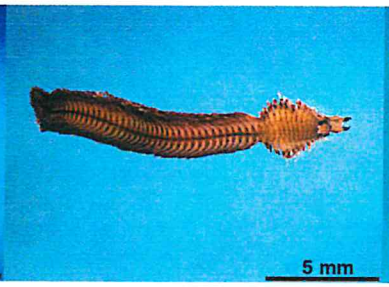

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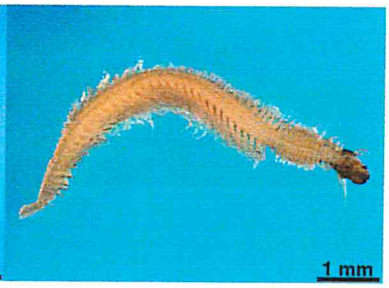

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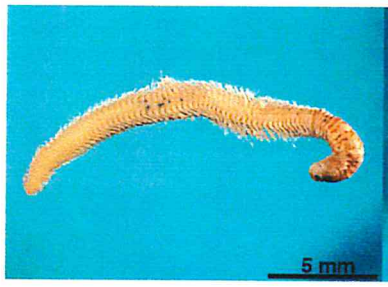

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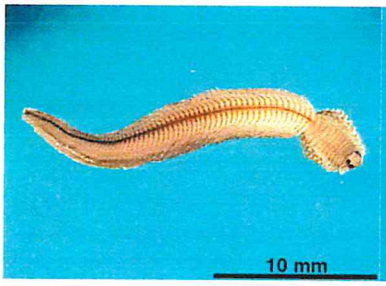

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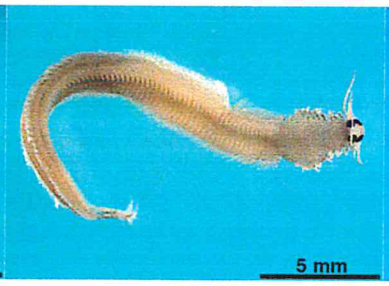

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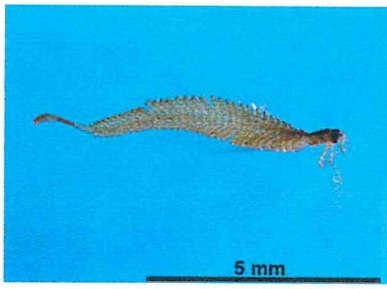

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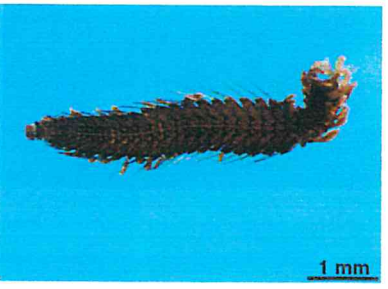

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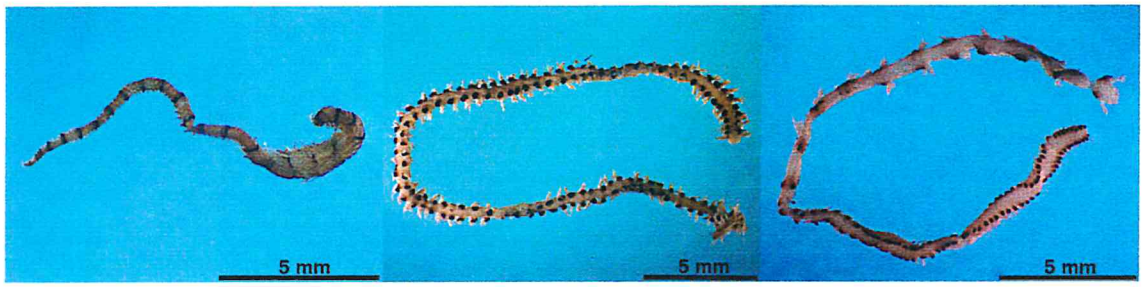

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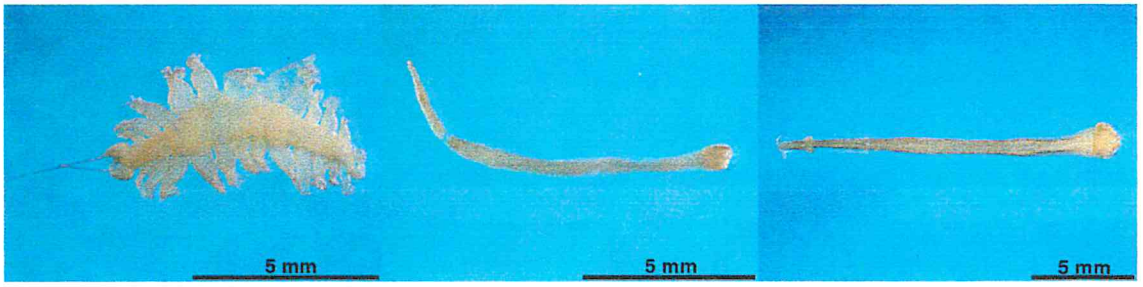

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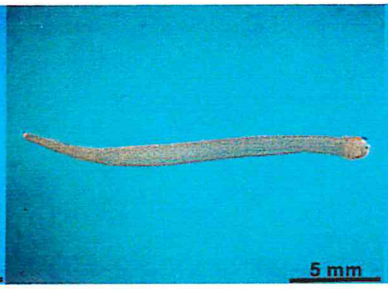

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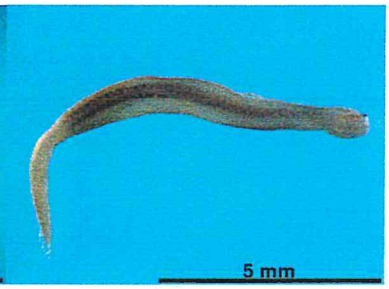

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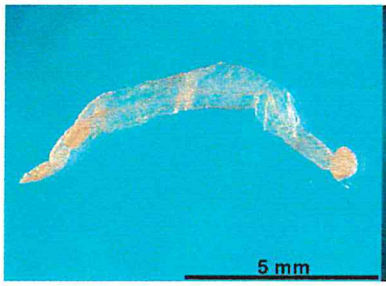

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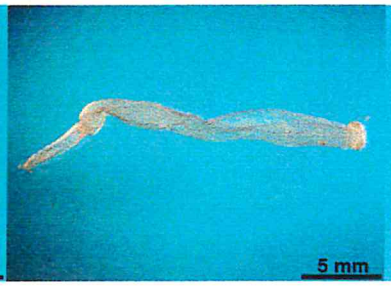

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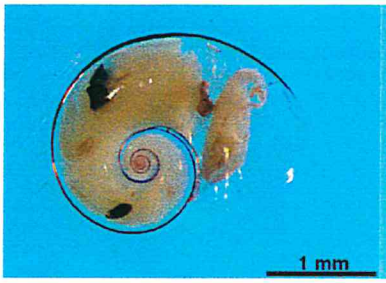

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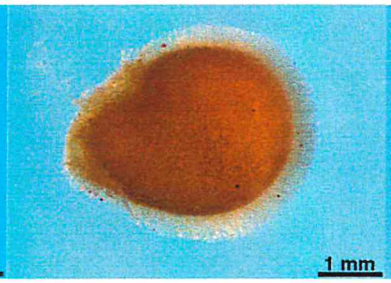

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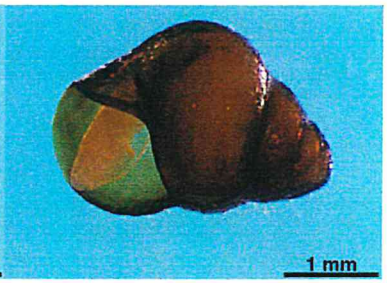

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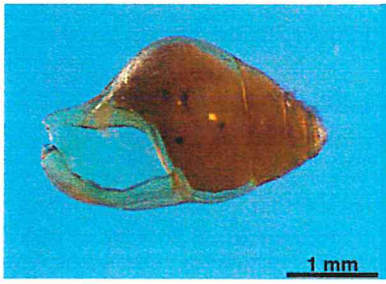

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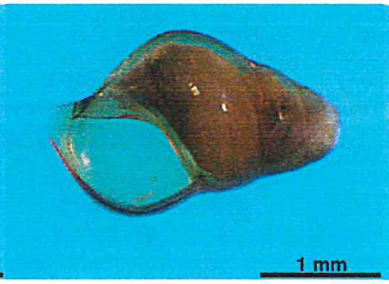

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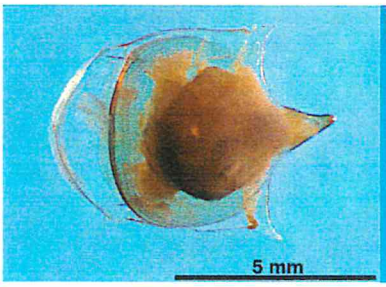

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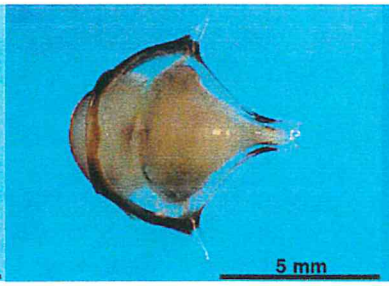

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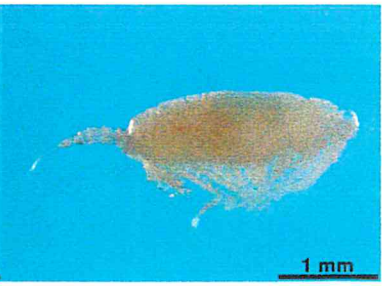

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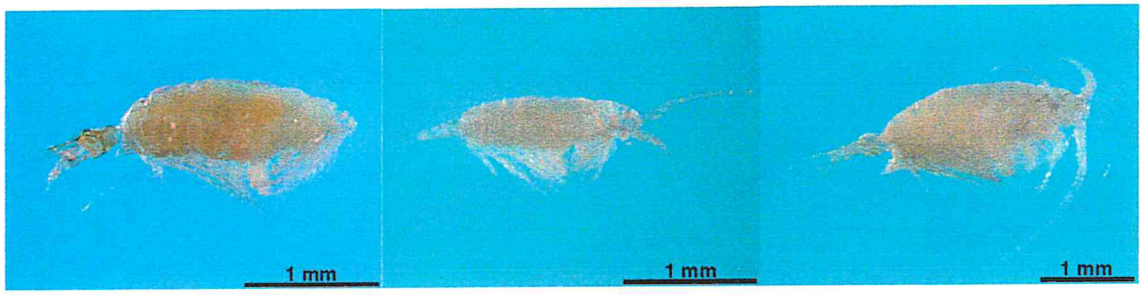

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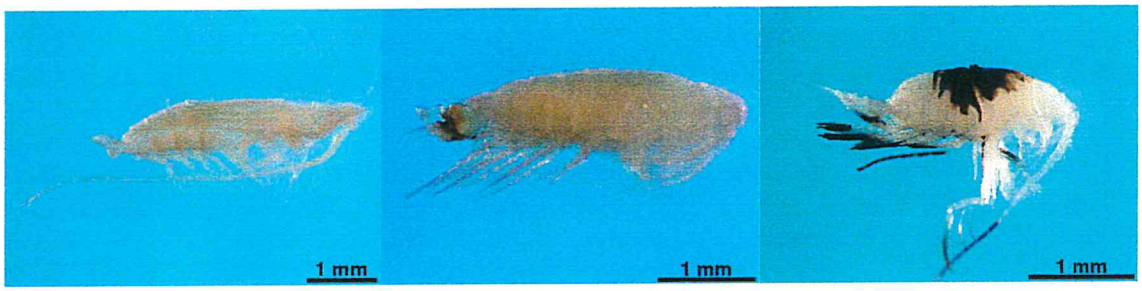

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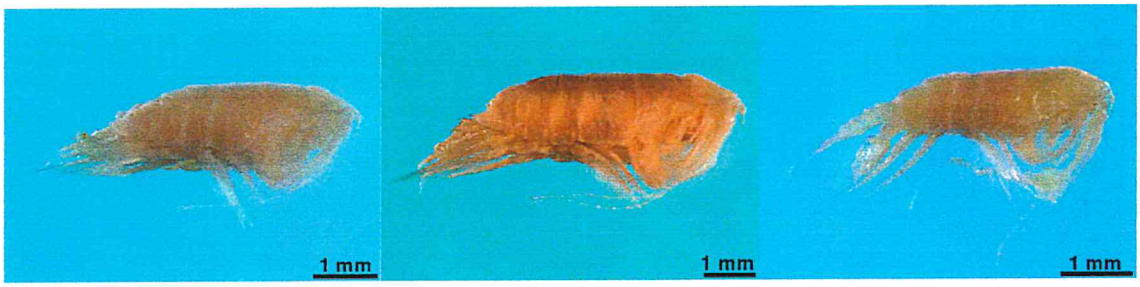

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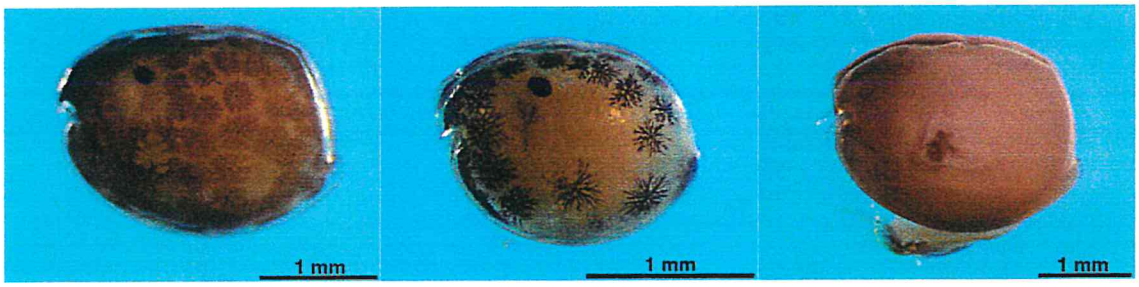

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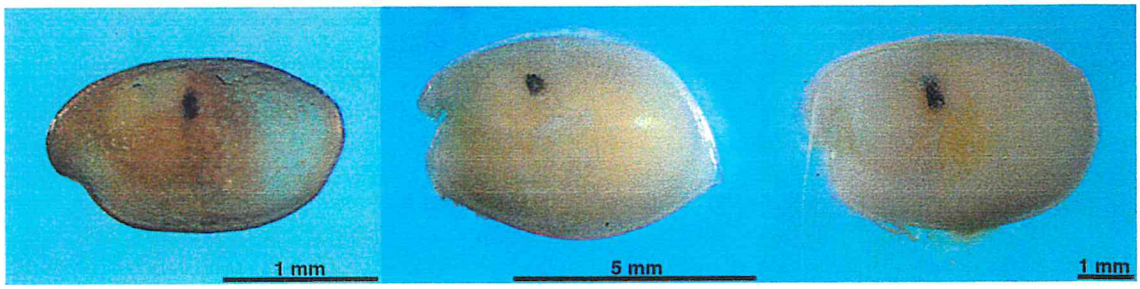

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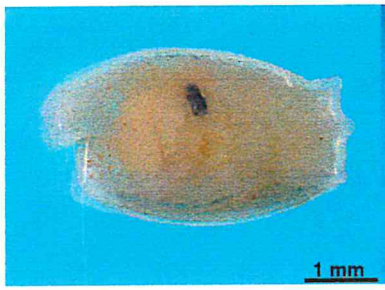

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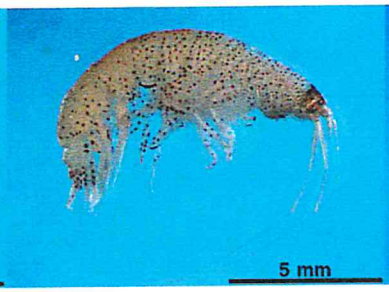

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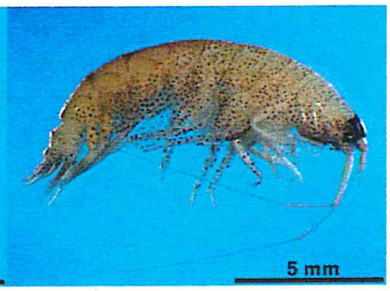

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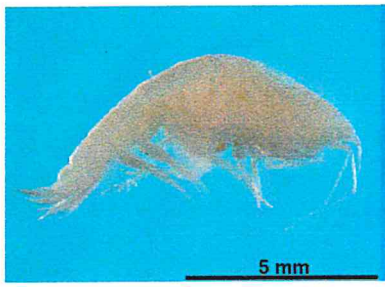

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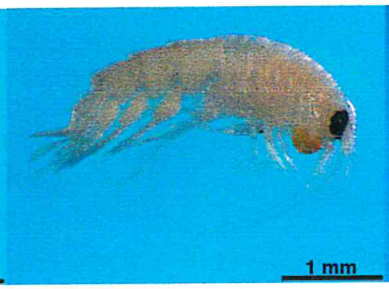

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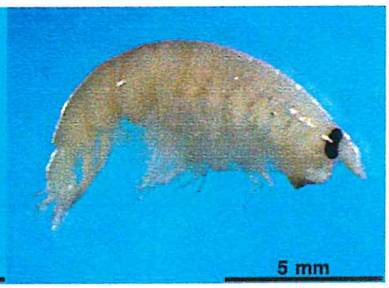

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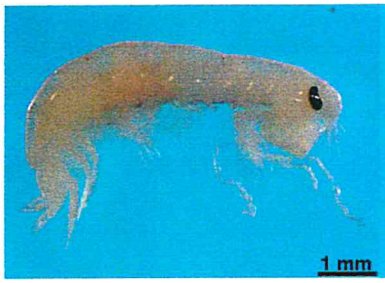

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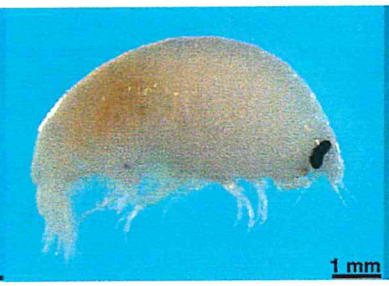

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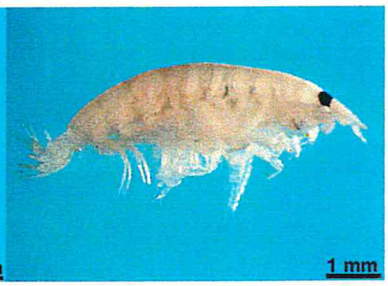

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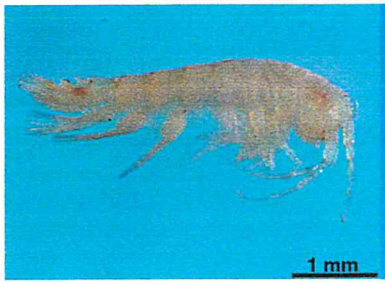

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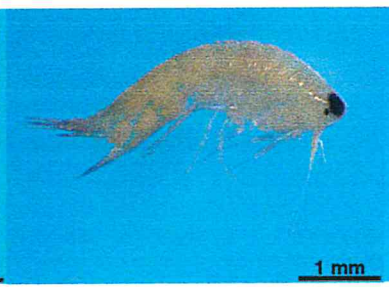

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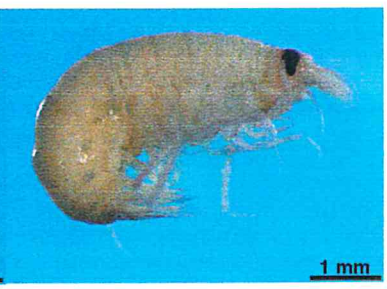

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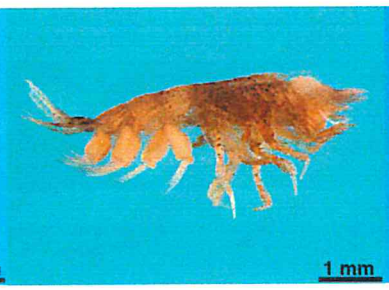

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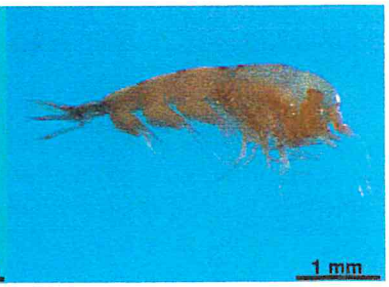

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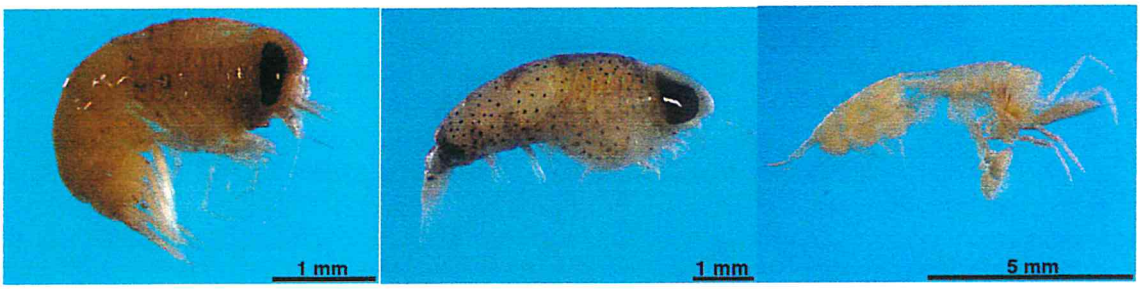

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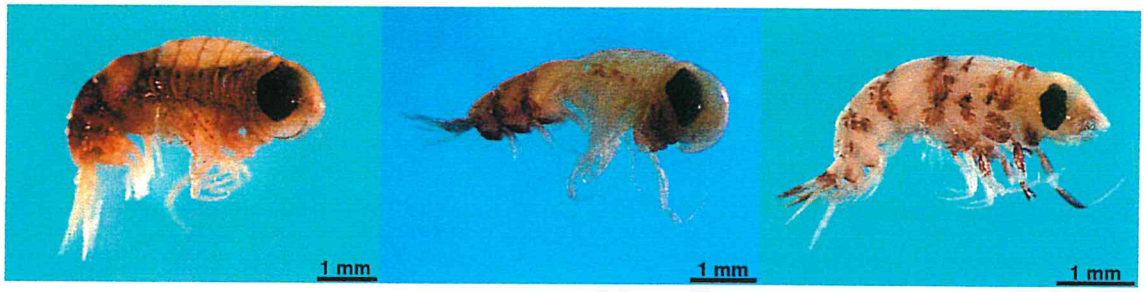

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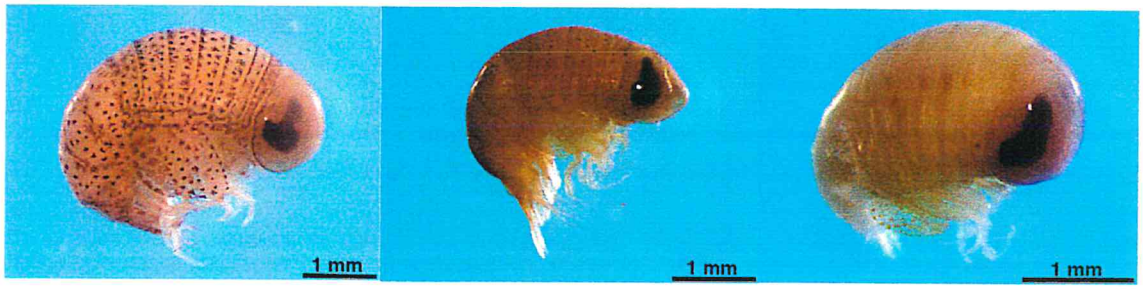

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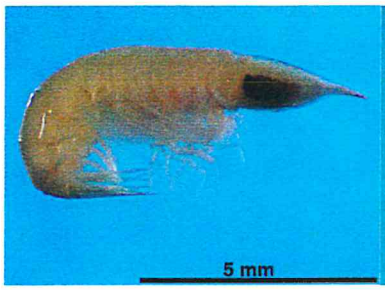

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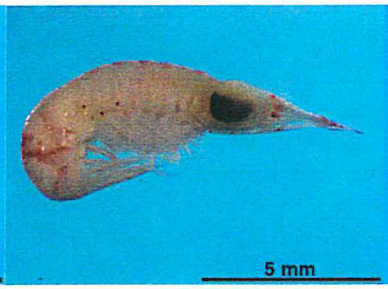

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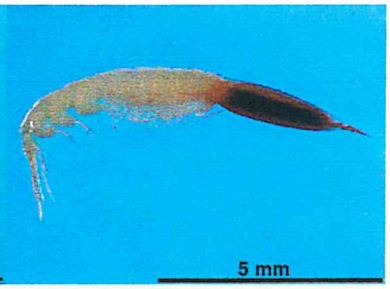

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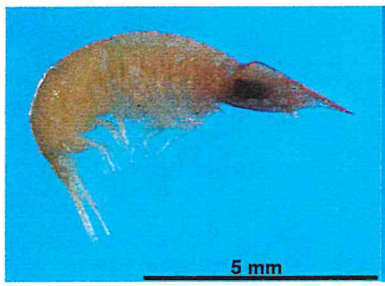

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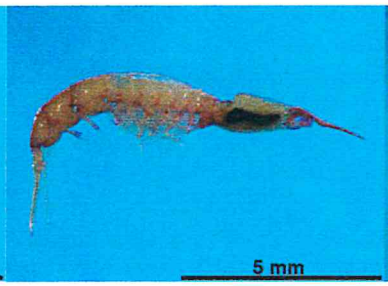

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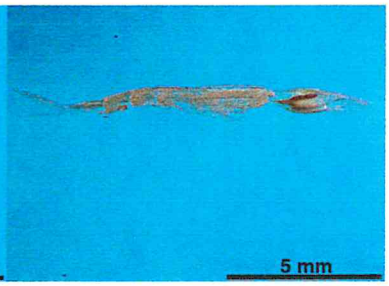

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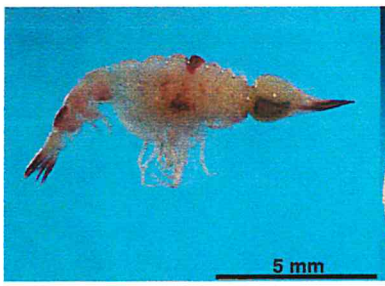

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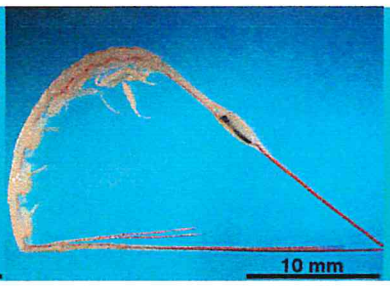

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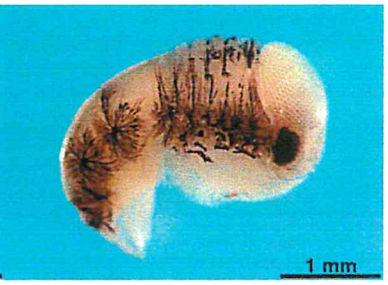

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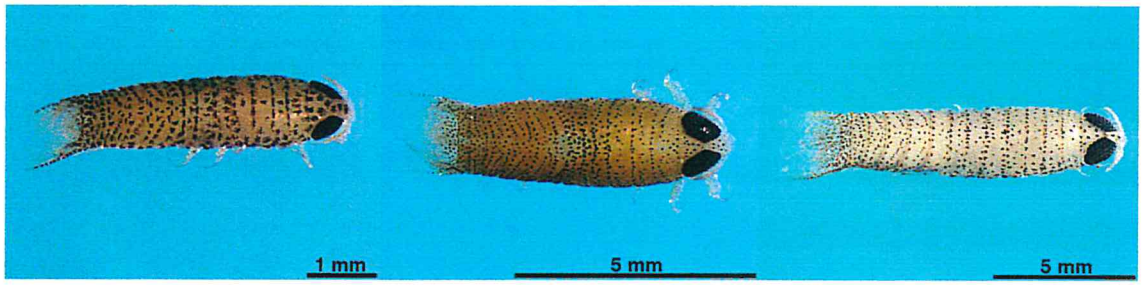

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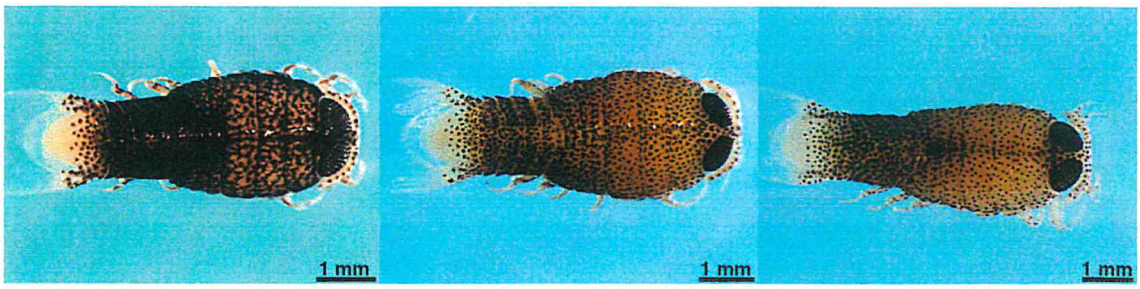

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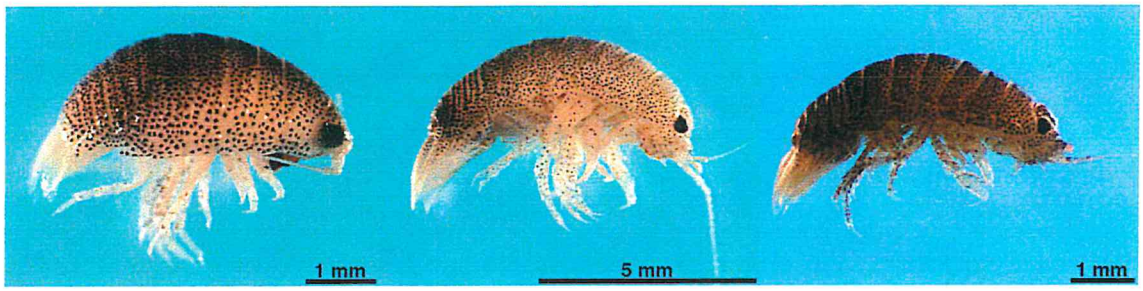

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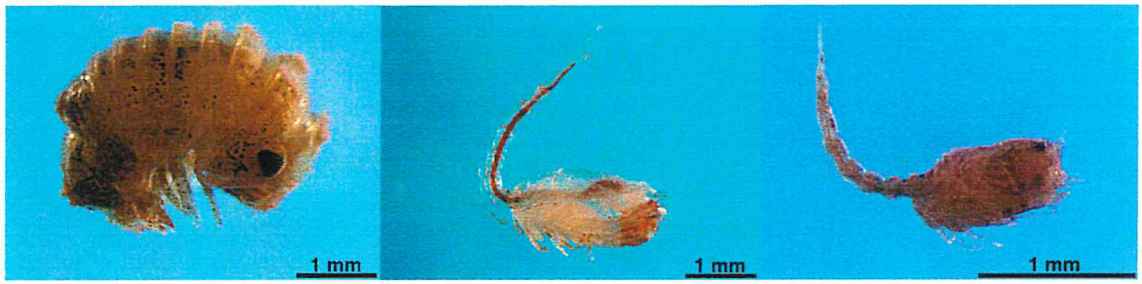

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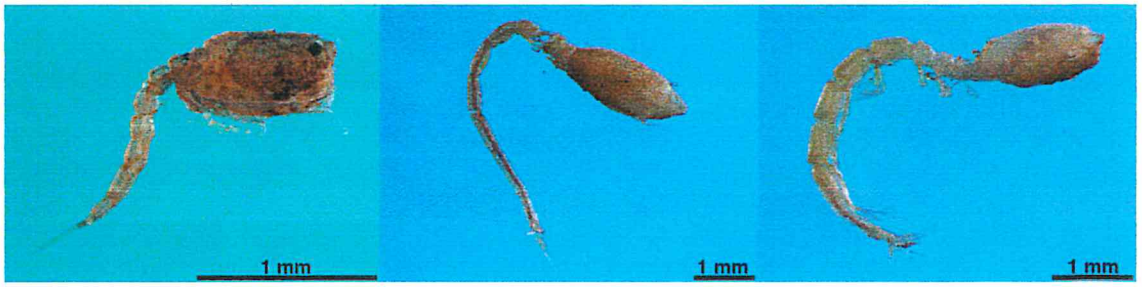

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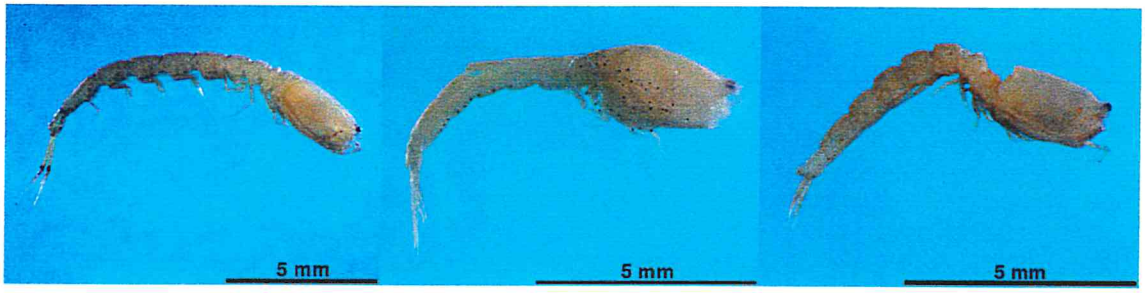

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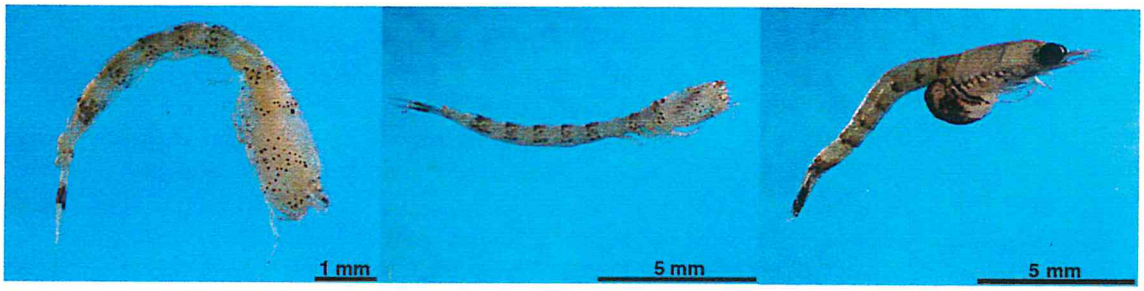

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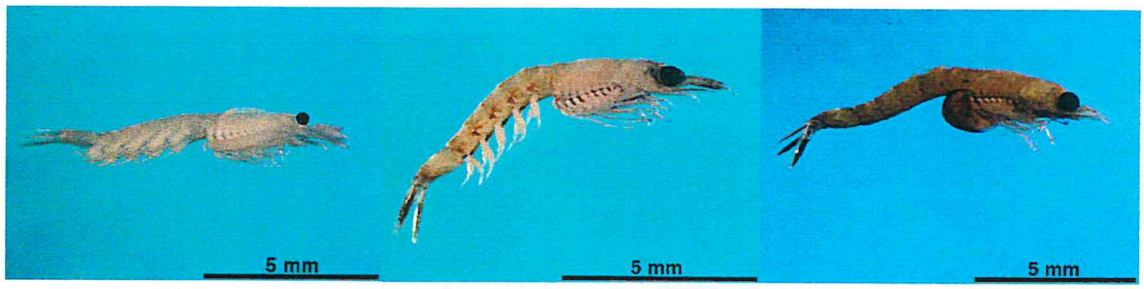

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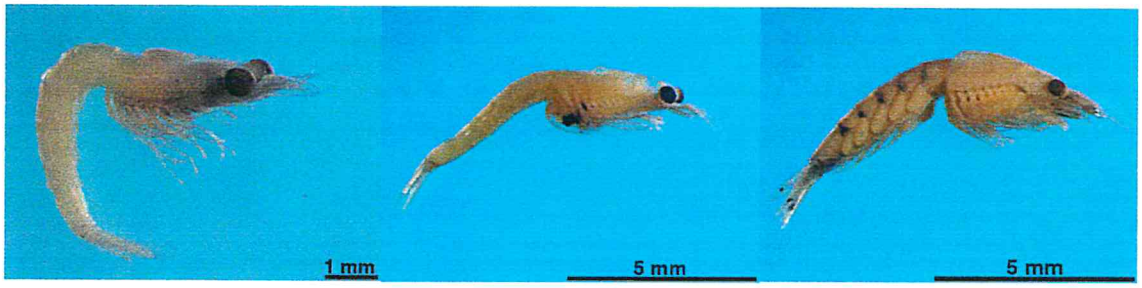

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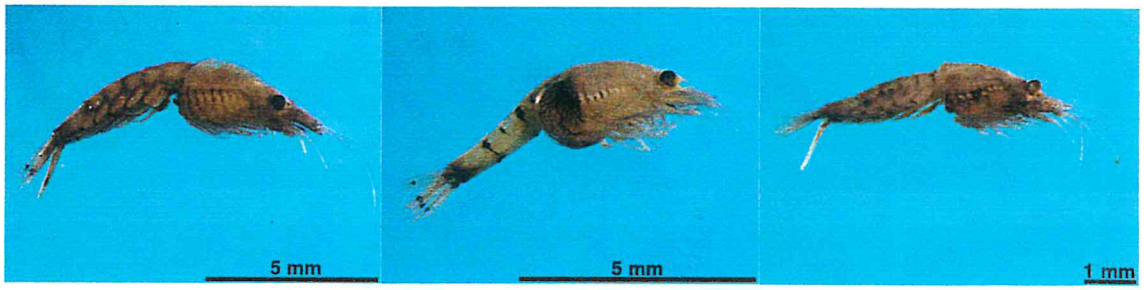

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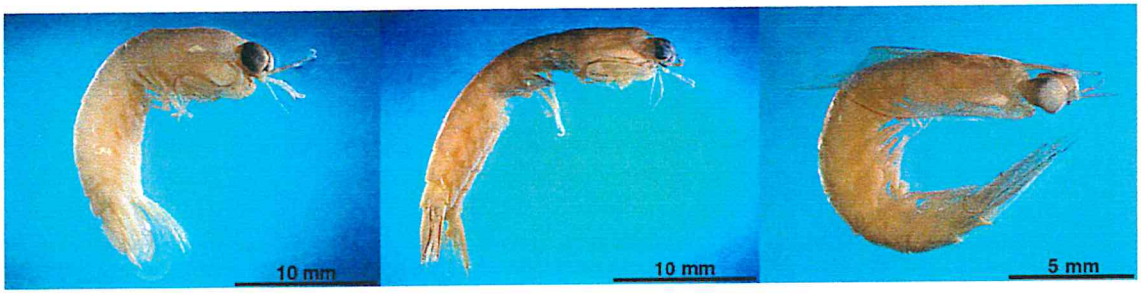

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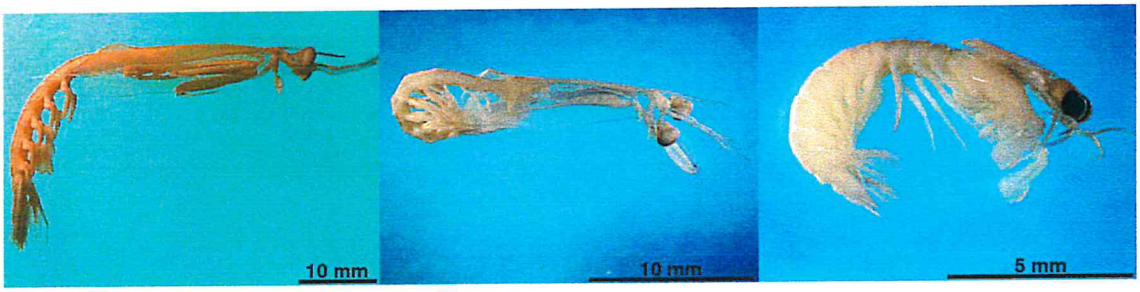

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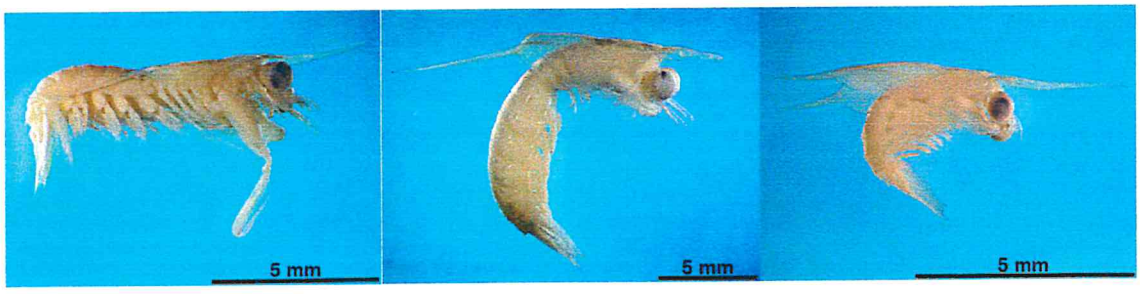

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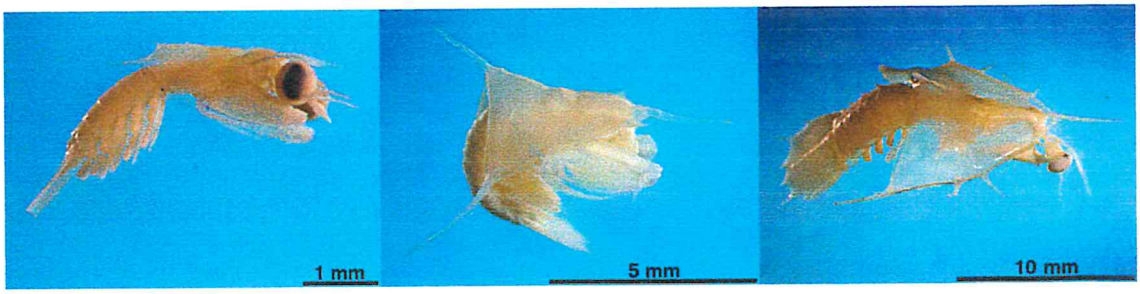

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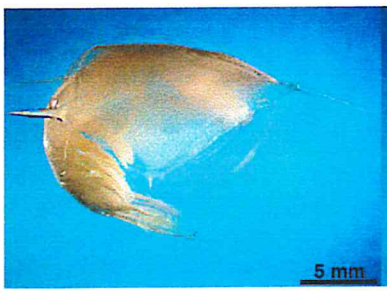

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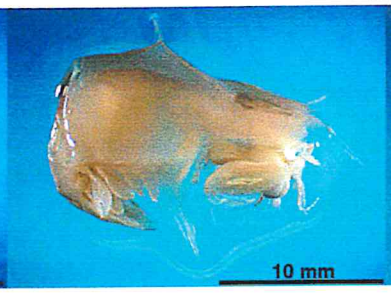

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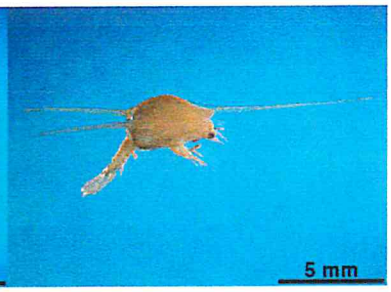

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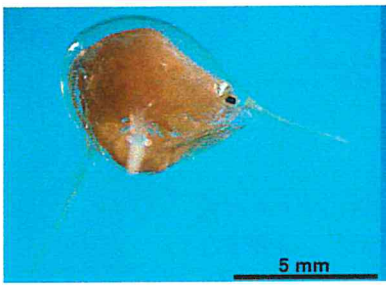

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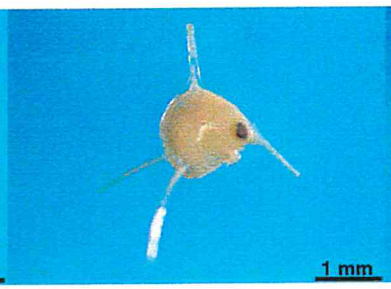

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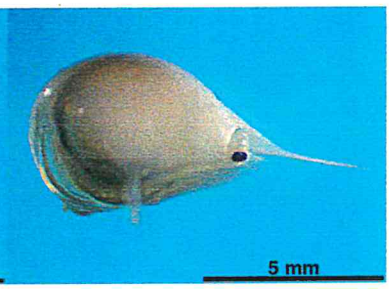

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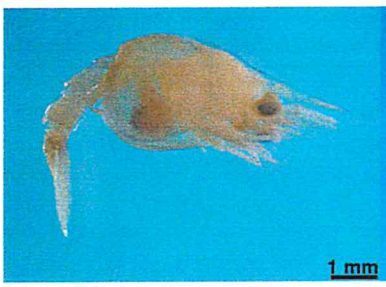

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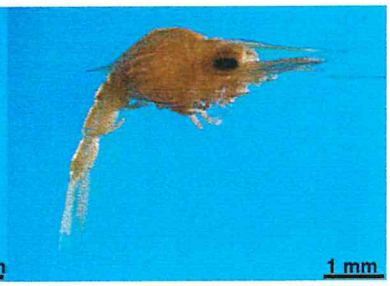

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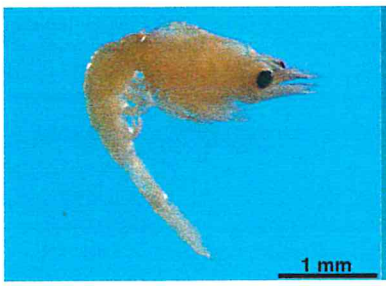

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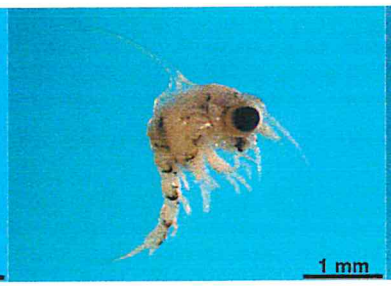

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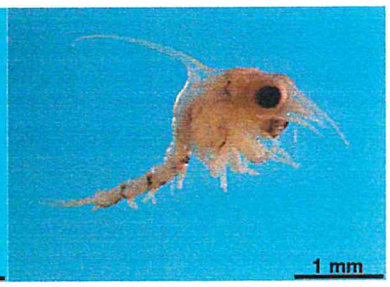

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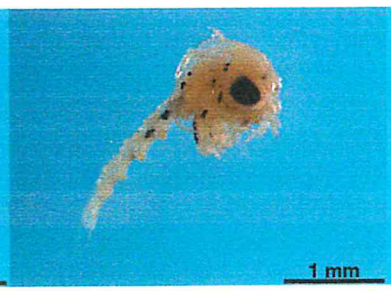

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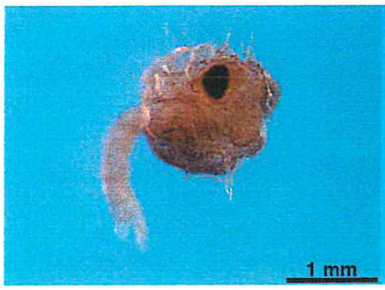

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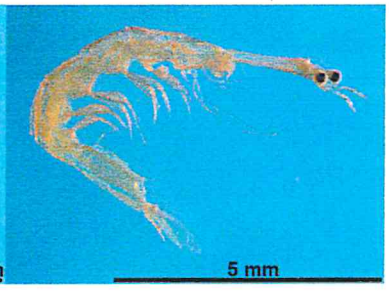

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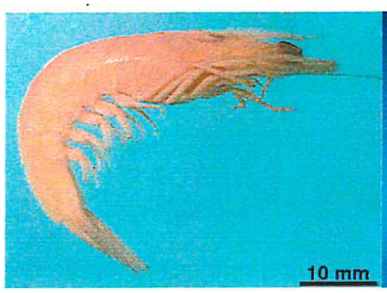

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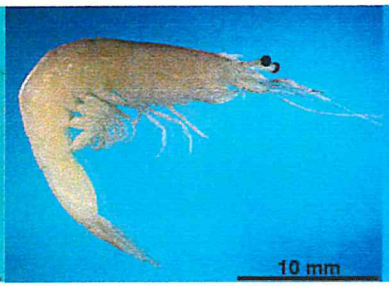

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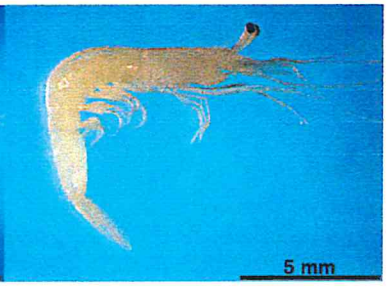

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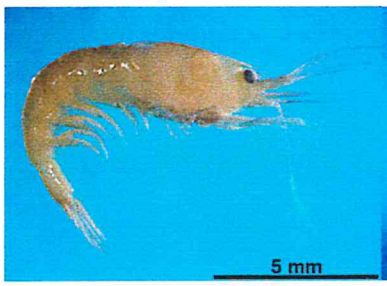

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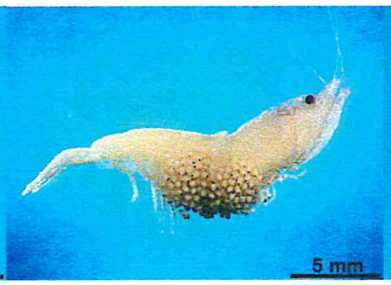

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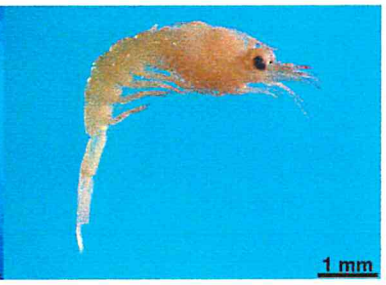

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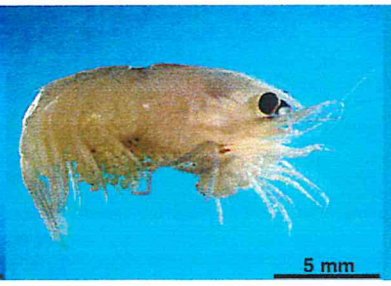

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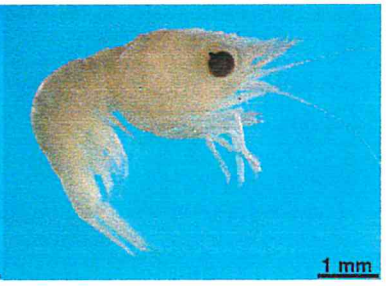

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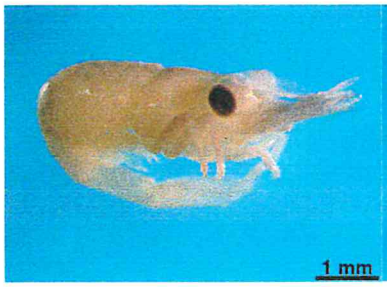

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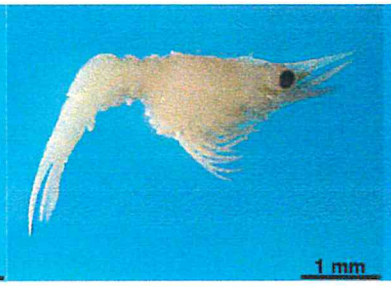

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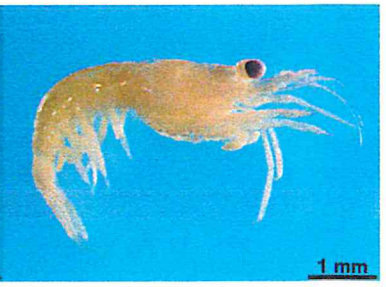

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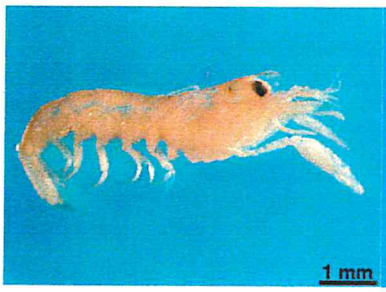

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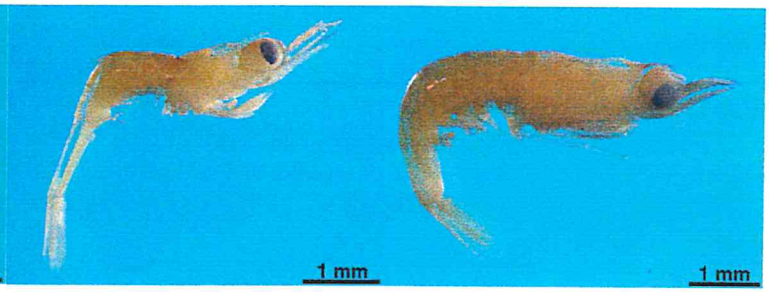

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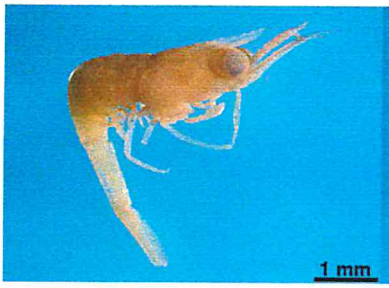

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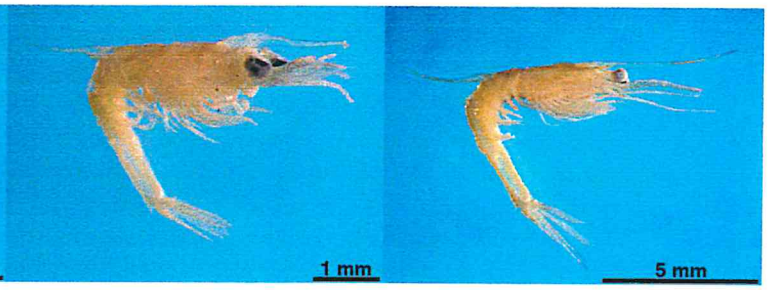

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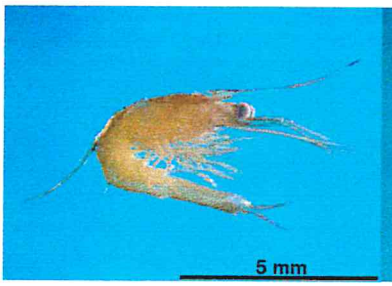

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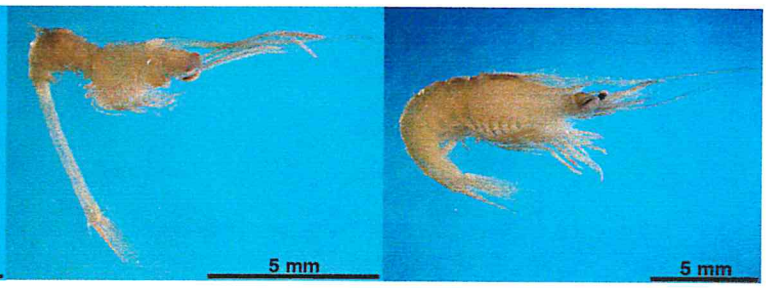

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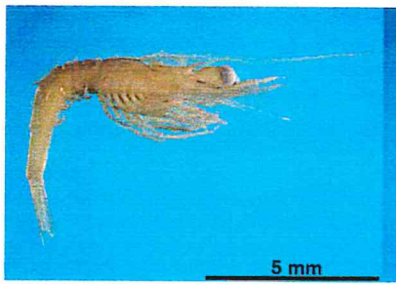

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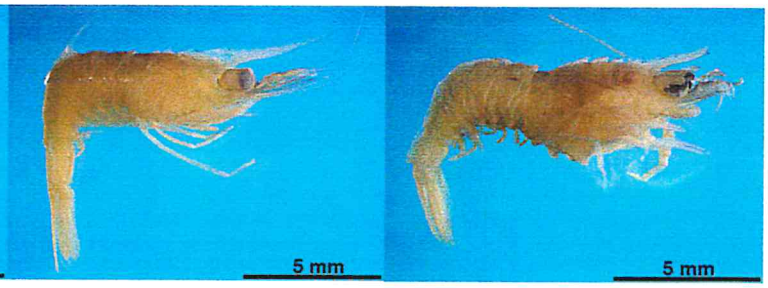

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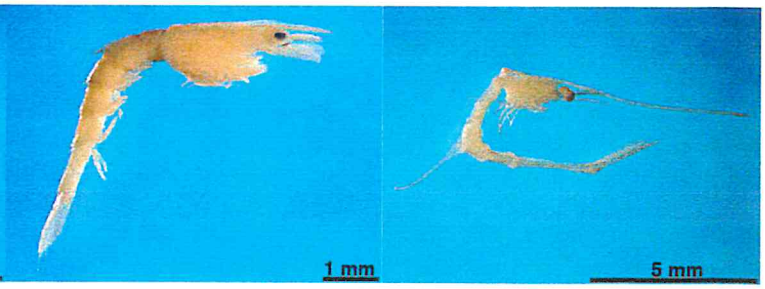

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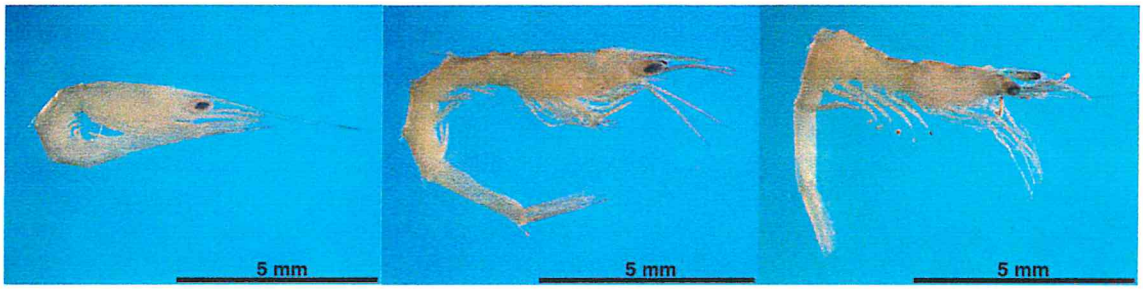

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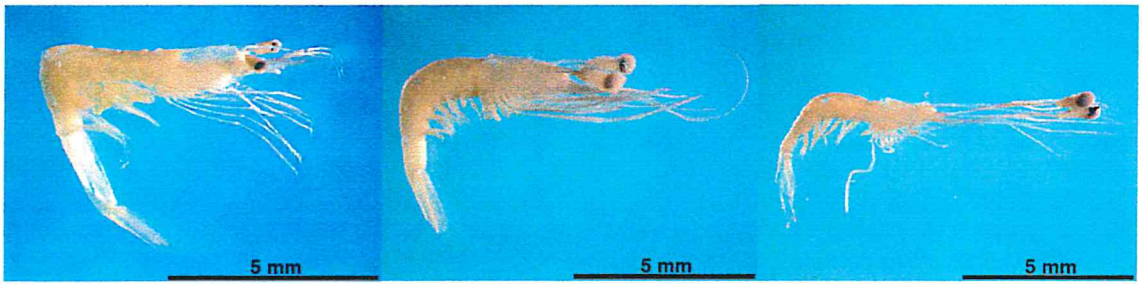

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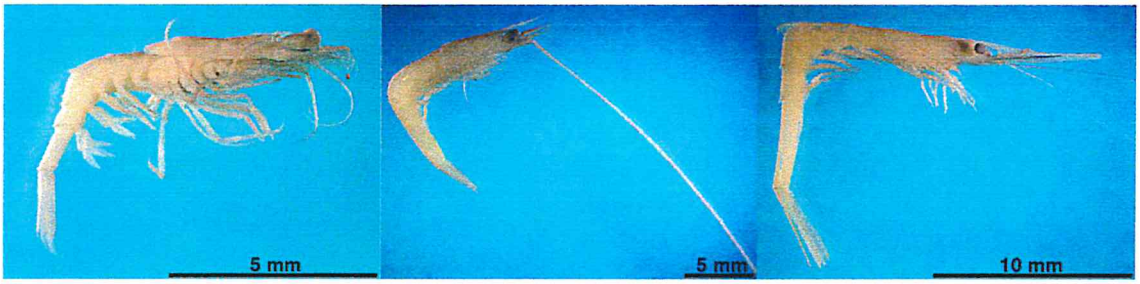

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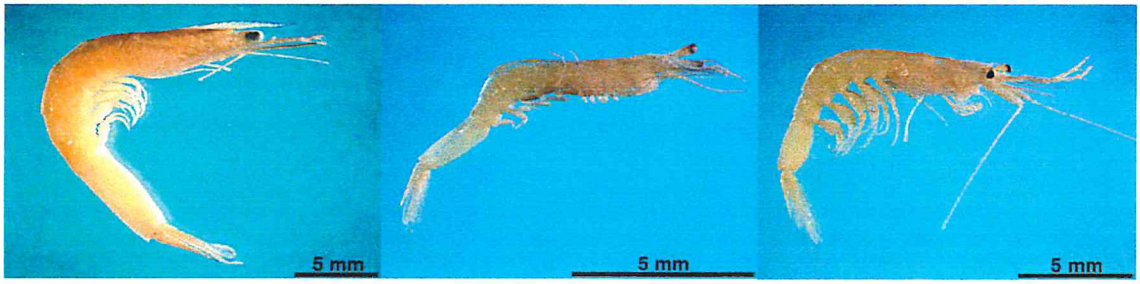

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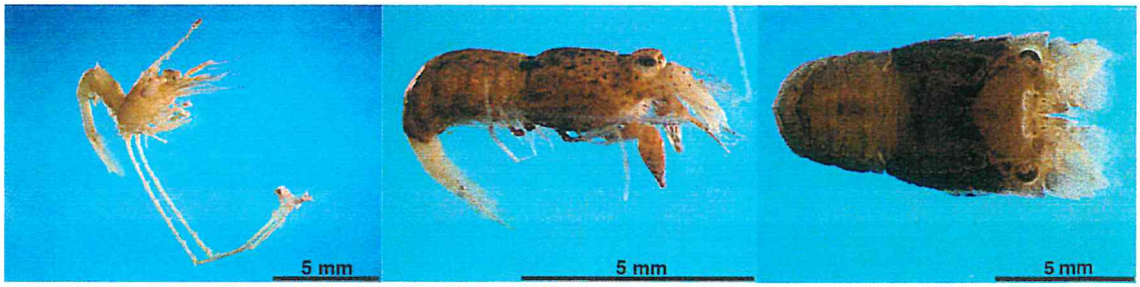

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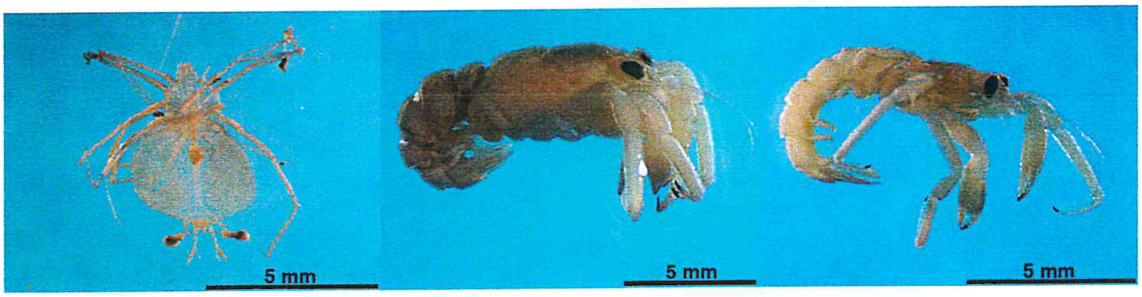

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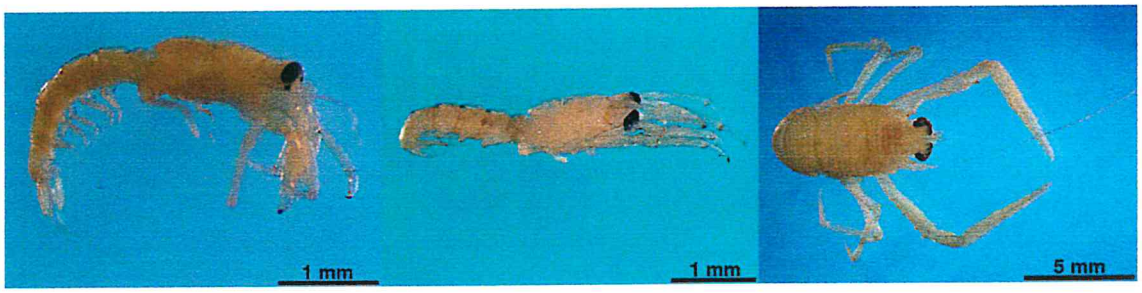

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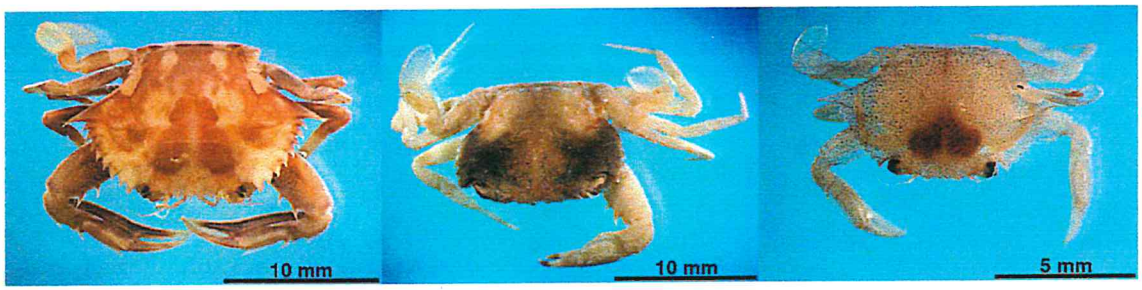

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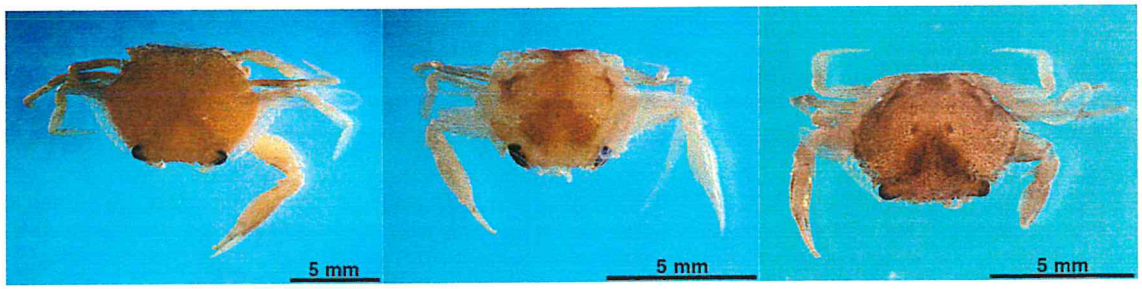

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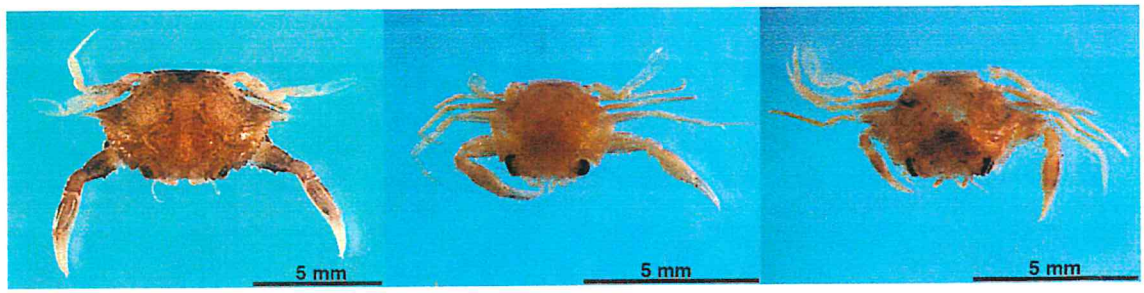

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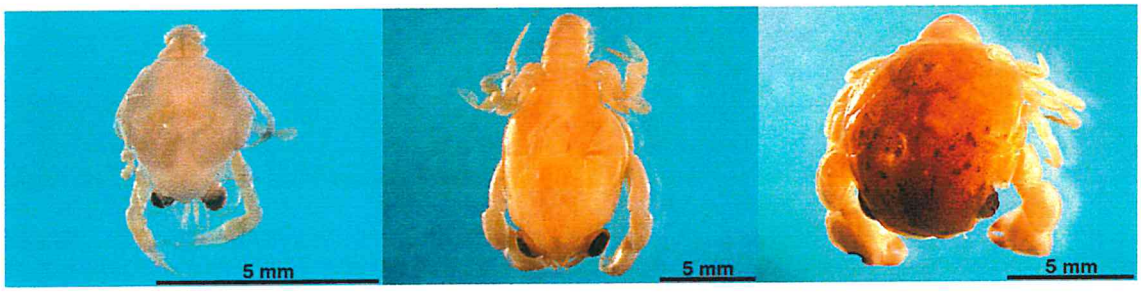

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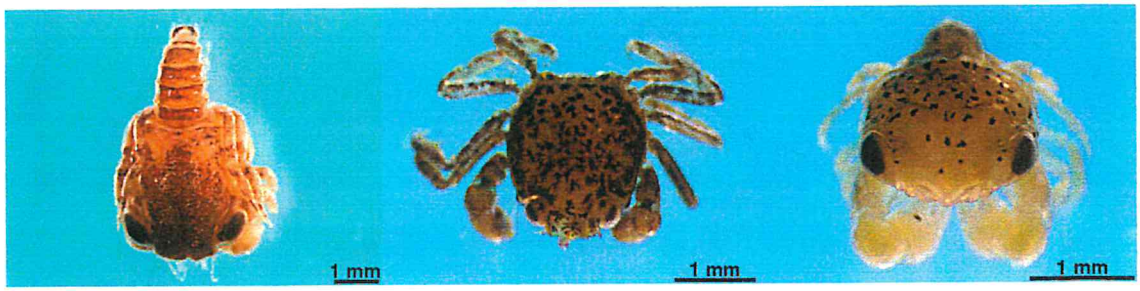

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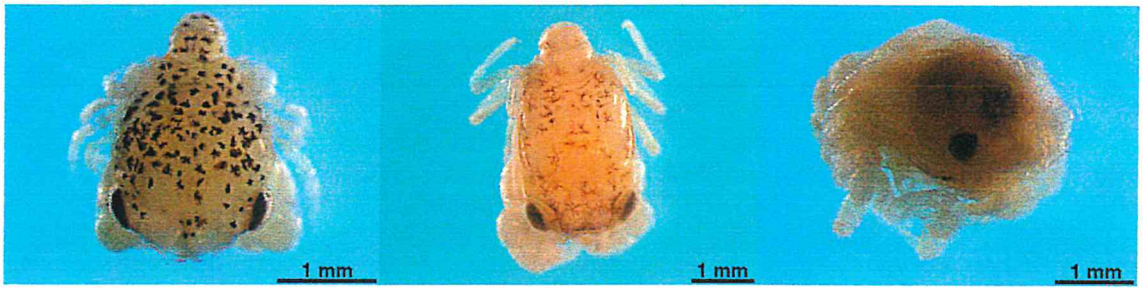

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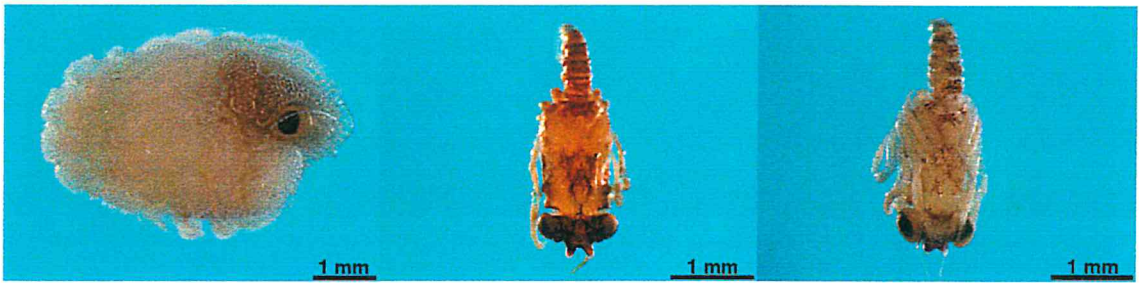

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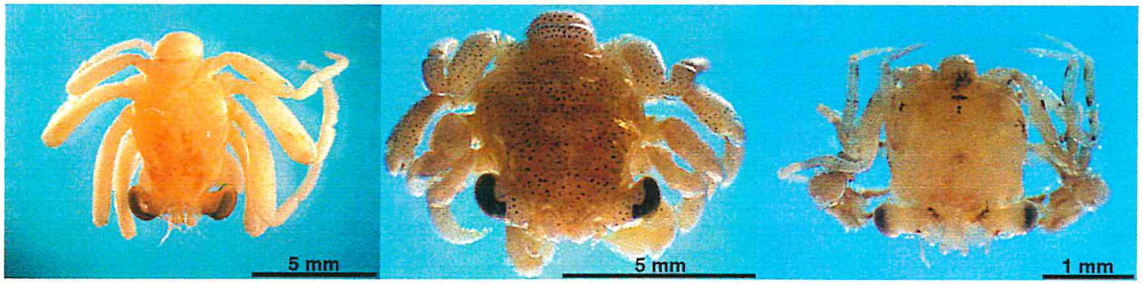

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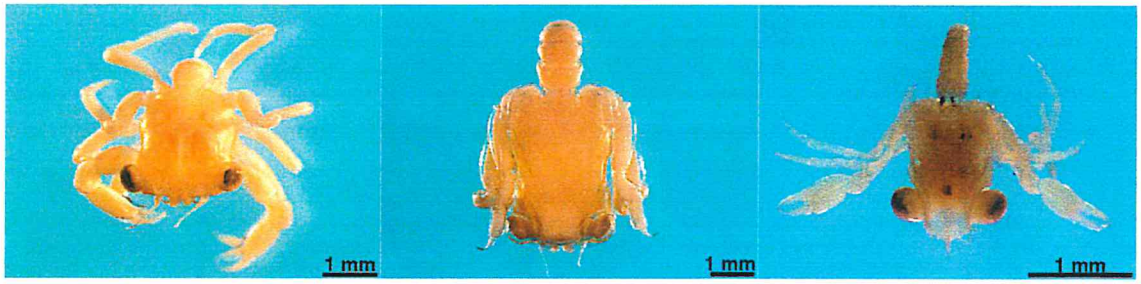

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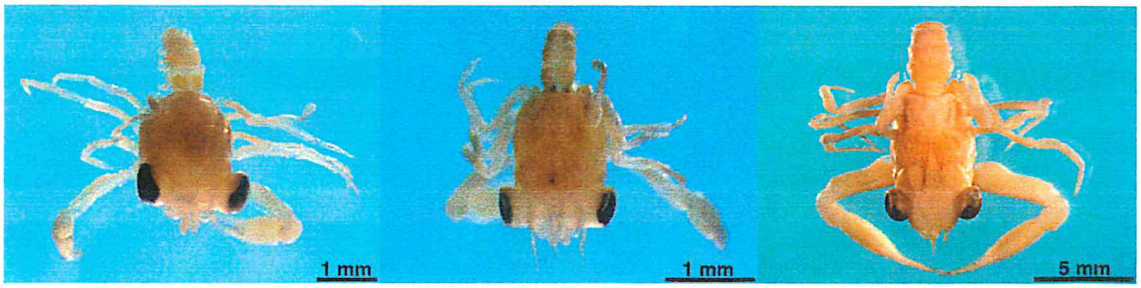

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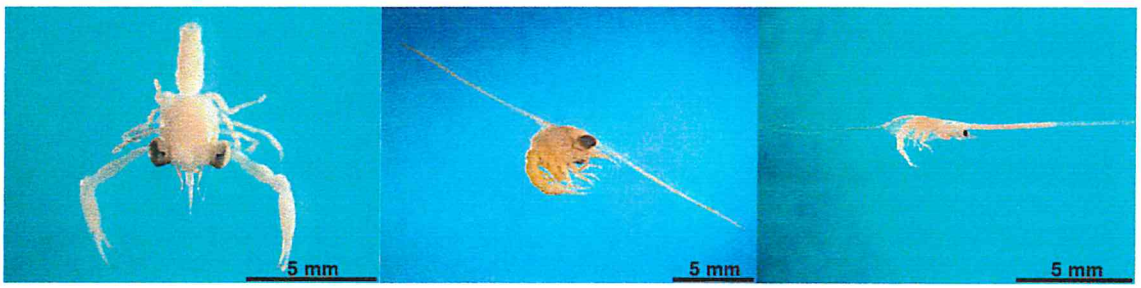

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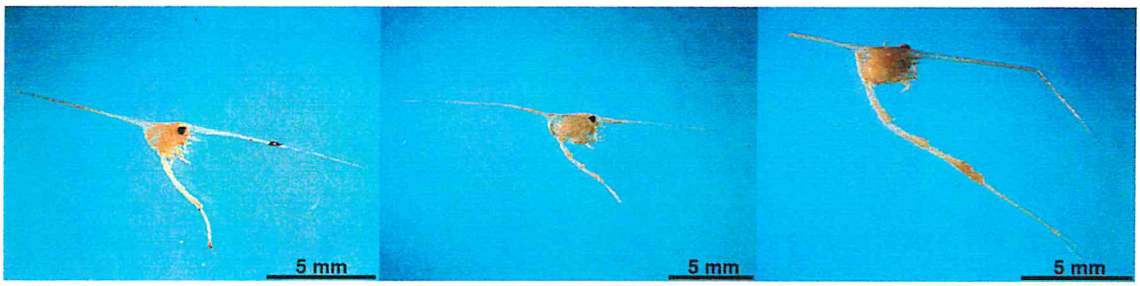

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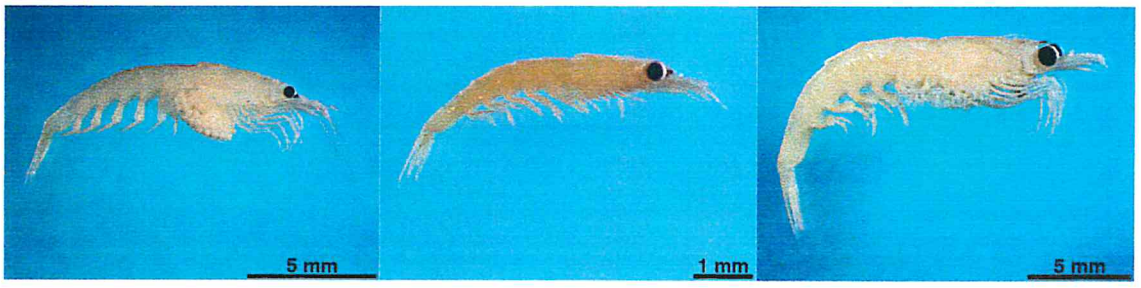

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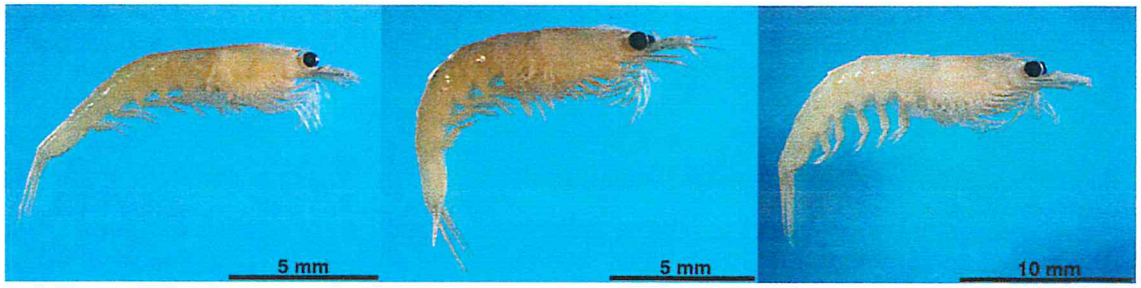

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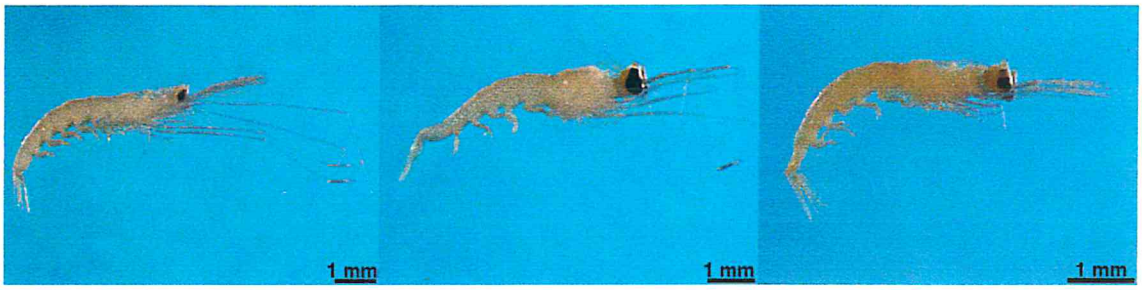

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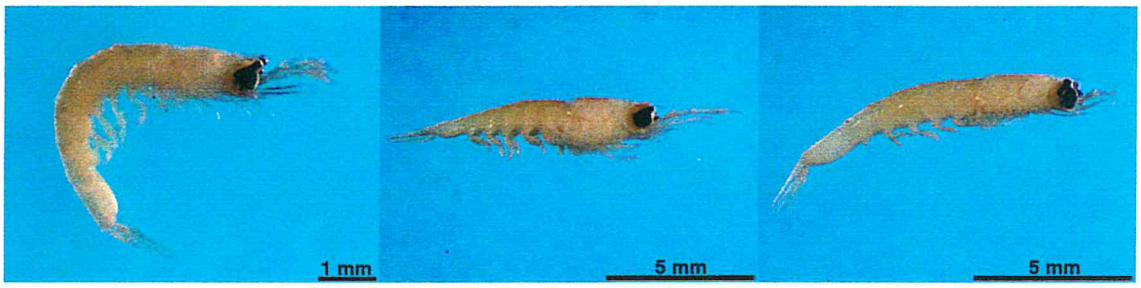

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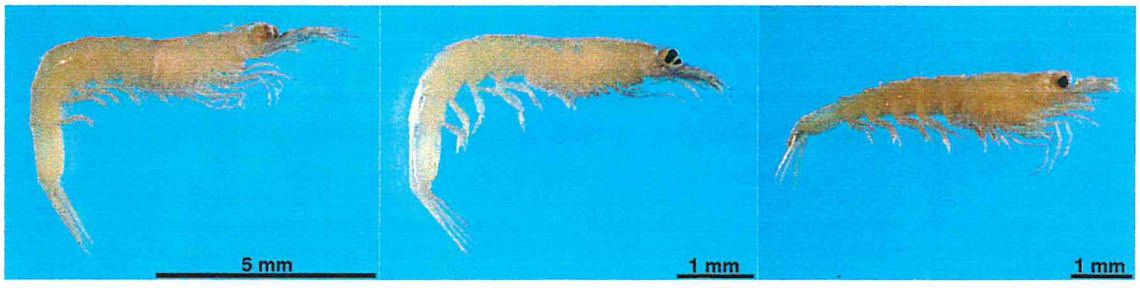

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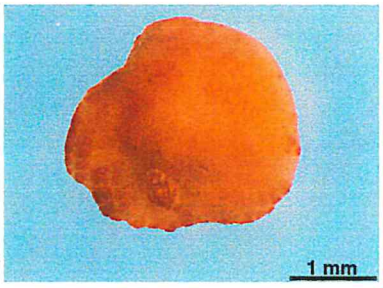

313.