

Utilization of Inorganic and Organic Carbon Compounds by Antarctic Zooplankton

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Antarctic Crustacea of the genus *Parathemisto* and *Euphausia triacantha* were studied during the antarctic winter, 1965, in the Pacific sector from 55°S. to the pack ice, principally between 130°W. and 140°W. and between 95°W. and 110°W. (cf. fig. 1). The results showed that inorganic car-

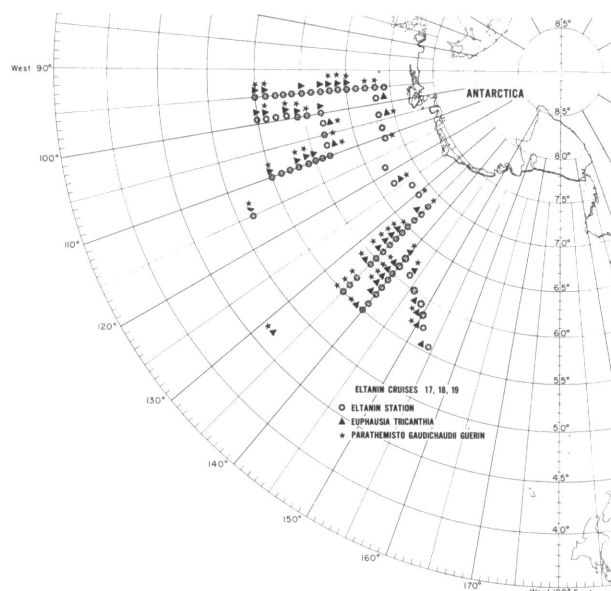


Fig. 1. Stations Taken in the Pacific Sector of Antarctic Waters during Cruises 17, 18, and 19 of USNS Eltanin. Stations where Amphipods (*Parathemisto*) and Euphausiids (*E. triacantha*) were Collected, are Shown.

bon, provided as $\text{Na}_2\text{C}^{14}\text{O}_3$, is absorbed from seawater and the C^{14} -label is recovered in glycogen, lipid, and respiratory CO_2 . In addition, there was a net decrease in total CO_2 in seawater. The presence of soluble glucose significantly reduced C^{14} incorporation from $\text{Na}_2\text{C}^{14}\text{O}_3$ or from C^{14} -acetate, providing evidence of metabolic incorporation of each of these molecular species. The presence of soluble protein reverses the action of glucose depression of $\text{Na}_2\text{C}^{14}\text{O}_3$ incorporation and leads to increased C^{14} -glycogen synthesis.

The possibility that soluble organic compounds act as a nutrient source for oceanic zooplankton is inferred. Based upon the reported lack of amino

acid absorption by Crustacea (Stephens and Schinski, 1961) and the observations of alanine absorption by polar species, a physiological basis has been found for adaptation to low temperature and to long periods of low light intensity at high latitudes. The results of this study support the position of Fox and Coe (1943) concerning phytoplankton feeders within food chains, but do not require the thesis that soluble molecules be converted to colloidal dimensions for nutrient utilization.

References

- Fox, D. L. and W. R. Coe. 1943. Biology of the California sea-mussel (*Mytilus californianus*), II: Nutrition, metabolism, growth and calcium deposition. *Journal of Experimental Zoology*, 93(2): 205-249.
- Stephens, G. C. and R. A. Schinski. 1961. Uptake of amino acids by marine invertebrates. *Limnology and Oceanography*, 6: 175-181.

Systematics, Distribution, and Origin of Antarctic Deep-Sea Marine Isopoda

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During the past year, close affinities were discovered between abyssal species in the Caribbean and the Pacific, suggesting either exceptionally slow evolutionary rates for abyssal species, or an abyssal exchange across the Panama isthmus in the not too distant geologic past (Menzies and Frankenberg, in press).

This next year, studies are planned on the huge antarctic isopod *Glyptonotus* and on the similarly large antarctic species of *Serolis*. A project involving observations of living specimens of *Glyptonotus* at McMurdo is planned as part of the work on the systematics of this isopod.

Groups not yet studied include the Valvifera, Flabellifera, and Anthuroidea. Many of the Asellote genera and species are now completed.

References

- Menzies, R. J. and G. A. Schultz. 1966. Antarctic isopod crustaceans, I: First photographs of isopod crustaceans on the deep-sea floor. *Internationale Revue der gesamten Hydrobiologie*, 51(2): 335-339.
- Menzies, R. J. and D. Frankenberg. in press. Systematics and distribution of the bathyal-abyssal genus *Mesosignium* (Crustacea: Isopoda). *Antarctic Research Series*.
- Menzies, R. J. and G. A. Schultz. in press. Antarctic isopod crustaceans, II: *Antennuloniscus*, *Aspidoniscus*, gen. nov. and *Acanthaspida* Stebbing and related genera. *Antarctic Research Series*.