

Euphausia pacifica: a euphausiid (krill) species of trophic and economic importance throughout the North Pacific

There is considerable interest in studying the krill, *Euphausia pacifica*, in the Yellow Sea and East China Sea because this species is a key link in the food chain between phytoplankton and fishes. This species is unique in that it can feed upon very small phytoplankton particles (as small as 3-4 μm) as well as large diatoms and ciliates thus this species can survive and even prosper in a wide variety of both oligotrophic as well as eutrophic ecosystems, in coastal as well as oceanic waters. *Euphausia pacifica* is broadly distributed throughout the coastal and oceanic waters of the Western Pacific ranging from the very cold waters offshore of the Sea of Okhotsk, then south through the Oyashio Current, the Japan/East Sea, the Yellow Sea, and the East China Sea. Given their ability to survive in a wide variety of ecosystems, it is not surprising that this species dominates the euphausiid assemblage in the Yellow and East China sea.

Although it is well known that this species is the dominant form in marginal seas of China, our knowledge of their seasonal cycles of abundance, age structure and rates of growth, production and consumption are not well known. Significant research has been done both at the East China Sea Fisheries Science Center in Shanghai (CAFS) by Dr. Zhao Li and at the Institute of Oceanology, Chinese Academy of Sciences in Qingdao by members of Prof Sun Song's laboratory, however far more work is needed on inter-annual variations in abundance and biomass as well as on trophic ecology. One topic of interest is the degree to which the population in the Yellow Sea supplies animals to the East China Sea. .

Other research topics of interest include the ecology of the giant jellyfish, *Nemopilema nomurai* and studies of the flux of plankton as waters flow past aquaculture rafts and farms.

Past Collaborations with Chinese scientists. Three Chinese students have been post-docs in Dr. Bill Peterson's laboratory and each of them were students at Ocean University in Qingdao: (1) Hongsheng Bi who is now an Assistant Prof. at the Univ. of Maryland; (2) Dr. Hui Liu, now an Assistant Professor at Texas A&M University, and (3) Dr. Xiuning Du, a recent graduate of Ocean University of China in Qingdao. Furthermore, Dr. Peterson is an Adjunct Professor of Oceanography at Ocean University, Qingdao:

A graduate student, Xiuning Du, completed her Ph.D. research in Dr. Bill Peterson's lab and graduated from Ocean University, in 2011. She is currently a post-doc with Dr. Peterson.

Publications of interest:

Shaw, C.T., W.T. Peterson and S. Sun. 2013. PICES Scientific Report No. 43, Report of Working Group 23 on Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim. 100 p.

Kawaguchi, S. and W. Peterson. 2010. Krill Biology and Ecology. Special Issue, Deep-Sea Res II 57:494-692 (17 research papers published in this special issue, including one on the vertical distribution of *E. pacifica* in the Yellow Sea

Johannson, M.L., A.L. Sremba, L.R. Feinberg, M.A. Banks and W. T. Peterson. 2012. The mitochondrial genomes of *Euphausia pacifica* and *Thysanoessa raschi* sequenced using 454 next-generation sequencing with a phylogenetic analysis of their position in the Malacostracan family tree. *Molecular Biology Reports*. 39:9009-9021