

Amphipoda of the Northeast Pacific (Equator to Aleutians, intertidal to abyss): XIII.
Crangonyctoidea – a review Donald B. Cadien, LACSD 17Mar2015

Preface

The purpose of this review is to bring together information on all of the species reported to occur in the NEP fauna. It is not a straight path to the identification of your unknown animal. It is a resource guide to assist you in making the required identification in full knowledge of what the possibilities are. Never forget that there are other, as yet unreported species from the coverage area; some described, some new to science. The natural world is wonderfully diverse, and we have just scratched its surface.

Introduction to the Crangonyctoidea

Lowry and Myers (2013) in their characterization of the Senticaudata, provided a general overview of the Superfamily Crangonyctoidea. The group is nearly completely fresh-water hypogean, although a few scattered representatives do occur in brackish waters in estuaries and tidal streams leading into them. The superfamily contains fourteen families, although only one, the Crangonyctidae, has representatives which occur in estuarine situations within the NEP, and are included here. Many of the other families are also not present in the NEP at all, being known from other parts of the globe. The Austroniphargidae for instance are not only solely freshwater and hypogean, but are found only in Madagascar (Lowry & Myers 2013).

Diagnosis of the Superfamily

Diagnosis: “Urosomite 1 with distoventral robust seta.” (from Lowry & Myers 2013)

Ecological Commentary

Crangonyctids have a history of anthropogenic introduction. In particular the two species known from NEP brackish waters have been introduced into other parts of the world as well. *Crangonyx pseudogracilis* (as *Eucrangonyx gracilis* – this was after all prior to the description of *C. pseudogracilis*) was detected in British locales as early as 1937 (Crawford 1937), later spreading through the British Isles. By 1980 it was detected in freshwaters of the Netherlands (Pinkster et al 1980), and it’s spread, along with other exotic introductions was monitored through riverine systems in the region (Hautus & Pinkster 1987).

While *C. pseudogracilis* was storming Europe, *C. floridanus* invaded the Orient. It was first detected in an oxbow lake of the Tone River, and has since spread to many locations throughout Japan (Morino et al 2004, Kanada et al 2007). Tojo et al (2010) review the biology of the species, and detect characteristics helpful in its invasion success. They singled out temperature tolerance, and reproductive potential as both significant factors in the efficient expansion of the invader against resident biota. The former in particular means that *C. floridanus* has much broader habitat niches available than do native species. The actual mechanism of introduction into Japanese inland waters remains undetermined.

Northeast Pacific Crangonyctoidea - The family is very well represented in McLaughlin et al (2005), but virtually all species are freshwater and either epigeal or hypogean. Only two species are known to frequent brackish waters within the NEP, both introduced from other portions of the United States. Neither are on the SCAMIT Edition 9 list (Cadien & Lovell 2014).

Family Crangonyctidae

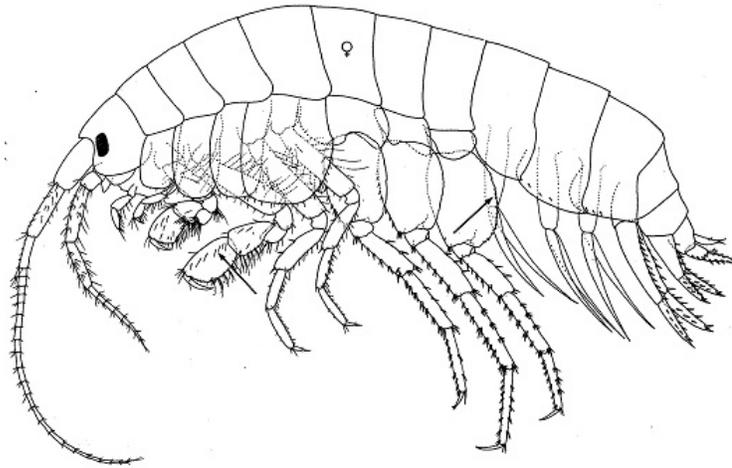
Crangonyx floridanus Bousfield 1963 – Freshwaters of the US from Florida to Oregon; Sacramento Delta, Introduced: 0-10m

Crangonyx pseudogracilis Bousfield 1958 – Freshwaters of eastern Canada, much of the US west to Arizona; Japan, Holland, brackish waters in San Francisco Bay/San Joaquin Delta, Introduced: 0-10m

Comments by Family

Crangonyctidae – The only family within the Superfamily with marine or brackish water representatives in the NEP. It contains seven genera, only one of which is represented in other than freshwater

Diagnostic description: “*Body laterally compressed or subcylindrical. Eyes well developed or absent, if present then round, ovoid or subrectangular. Antennae 1–2 calceoli crangonyctoid (type 9). Antenna 1 longer than antenna 2; peduncular article 1 subequal to, or longer than article 2; article 2 longer than article 3; article 3 shorter than article 1; peduncular articles 1–2 not geniculate; accessory flagellum minute. Antenna 2 peduncular article 1 enlarged, bulbous. Mandible molar triturative; palp symmetrical. Maxilla 1 basal endite setose along medial margin or apically setose; palps symmetrical. Maxilla 2 basal endite with oblique setal row. Labium inner lobes present. Coxal gills number and sequence [not known], stalked (with proximal restriction or complete suture); sternal gills present, simple; sternal blisters absent; oostegites fringing setae simple. Gnathopod 1 subchelate; similar in males and females (not sexually dimorphic); smaller (or weaker) than or similar in size to gnathopod 2; propodus palm with row or rows of simple or bifid robust setae along palmar margin. Gnathopod 2 subchelate; similar in males and females (not sexually dimorphic); carpus not produced along posterior margin of propodus, projecting between merus and propodus. Pereopods 3–4 not sexually dimorphic. Pereopod 4 with well developed posteroventral lobe or without posteroventral lobe. Pereopod 5 shorter than, subequal in length to, or longer than pereopod 6; coxa with large anteroventral lobe or with small anteroventral lobe. Pereopod 7 shorter than, subequal in length to, or longer than pereopod 5. Pleonites 1–3 without dorsal carinae. Urosomites 1–3 free; without slender or robust dorsal setae. Urosomite 1 with or without large distoventral robust seta. Urosomite 2 without dorsal setae. Uropod 1 with 1 or 2 basofacial robust setae or without basofacial robust setae. Uropod 3 not sexually dimorphic; biramous, uniramous or rami absent, without plumose setae; endopod minute or shorter than exopod. Telson moderately cleft, notched, emarginate or entire; dorsal or lateral robust setae absent; apical robust setae present.*” (from Lowry & Myers 2013)



Crangonyx pseudogracilis (from Bousfield 1973)

Crangonyx – A large genus, with 21 described taxa in the US (McLaughlin et al 2005). Virtually all of these are solely freshwater, although a few can tolerate waters of low salinity in brackish environments where fresh and marine waters meet. Two of these are present in the NEP, both introduced from other parts of the country. Zhang and Holsinger (2003) covered the genus comprehensively within the continental United States, erecting many new species, and providing keys to the genus as well as descriptions and distributional commentary on the taxa. They record over 40 taxa in the genus within the US. Both of the NEP taxa belong in the *C. floridanus* subgroup, and can be distinguished in the key to that subgroup provided. Chapman (2007) also provides a key and illustrations of key characters separating the two closely related species. Populations of *C. floridanus* in states bordering the Pacific vary from completely freshwater (Oregon), to slightly saline (California, Sacramento Delta) (Toft et al 2002). No records of *C. pseudogracilis* west of Arizona and Nevada were discussed by Zhang & Holsinger (2003), but the species has been reported from brackish backwaters in the San Francisco Bay/San Joaquin Delta system (Chapman 2007). Karaman (1978) even questioned if the two species, being so morphologically similar, were not the same. Recent investigations (Zhang and Holsinger 2003) view their slight morphological distinctions as valid, and retain both.

Literature Cited

- Bousfield, Edward L. 1958.** Fresh-water amphipod crustaceans of glaciated North America. *The Canadian Field-Naturalist* 72(2): 55-113.
- , **1963.** New freshwater amphipod crustaceans from Florida. *National Museum of Canada, Natural History Papers* 18: 1-9.
- , **1973.** *Shallow-water gammaridean Amphipoda of New England*. Ithaca, New York, Comstock Publishing Associates/Cornell University Press. 321pp,
- Cadien, Donald B. and Lawrence L. Lovell. 2014.** A Taxonomic Listing of Benthic Macro- and Megainvertebrates from Infaunal & Epifaunal monitoring and research programs in the Southern California Bight. Los Angeles, California, USA: 186pp.
- Chapman, John W. 2007.** *Gammaridea*. Pp. 545-618 IN: Carlton, James T. (ed.) *The Light and Smith Manual: Intertidal Invertebrates from Central California to Oregon*. Berkeley, California, U.S.A., University of California Press. 1001pp.
- Crawford, G. L. 1937.** An amphipod, *Eucrangonyx gracilis* S. L. Smith, new to Britain. *Nature*, 139:327.
- Hautus, Tjeu and Sjouk Pinkster 1987.** Range extension in the period 1985-1986 of the alien amphipods, *Gammarus tigrinus*, Sexton 1939, and *Crangonyx pseudogracilis* Bousfield, 1958, in the Netherlands (Crustacea, Amphipoda). *Bulletin Zoologisch Museum Universiteit van Amsterdam* 11(6): 57-64.
- Holsinger, John, Tammy Horton, James Lowry. 2014.** Crangonyctidae Bousfield, 1973. In: Horton, T.; Lowry, J. & De Broyer, C. (2013 onwards) World Amphipoda Database. Accessed through: World Register of Marine Species at <http://www.marinespecies.org/aphia.php?p=taxdetails&id=430454>
- Kanada, Shoji, Ryoichi B. Kuranishi, Shin-ichi Ishiwata, Koji Tojo, Takao Shimizu, Hiroyuki Taira, and Kiyoshi Satake. 2007.** Distribution of an alien species, *Crangonyx floridanus* Bousfield (Crustacea: Amphipoda: Carangonyctidae) in Japan. *Japanese Journal of Limnology* 68: 449-460.
- Karaman, Gordan S. 1978.** Contribution to the Knowledge of the Amphipoda XCVII. On three interesting species, *Crangonyx floridanus* Bous. 1963, *C. parvimanus* (Hol. 1903) and *Orchestia tiberiadis* Lor. 1883. *Glasnik Republickog Zavoda za Zastitu Pirode – Prirodnjackog Muzeja Titograd* 11: 65-73.
- Lowry, James K. & Alan A. Myers. 2013.** A phylogeny and classification of the Senticaudata subord. nov. (Crustacea: Amphipoda). *Zootaxa* (3610): 1-80.
- McLaughlin, P. A., D. K. Camp, M. V. Angel, E. L. Bousfield, P. Brunel, R. C. Brusca, D. B. Cadien, A. C. Cohen, K. Conlan, L. G. Eldredge, D. L. Felder, J. W. Goy, T. A. Haney, B. Hann, R. W. Heard, E. A. Hendrycks, H. H. Hobbs III, J. R. Holsinger, B. Kensley, D. R. Laubitz, S. E. LeCroy, R. Lemaitre, R. F. Maddocks, J. W. Martin, P. Mikkelsen, E. Nelson, W. A. Newman, R. M. Overstreet, W. J. Poly, W. W. Price, J. W. Reid, A. Robertson, D. C. Rogers, A. Ross, M. Schotte, F. R. Schram, C.-T. Shih, L. Watling, and G. D. F. Wilson. 2005.** *Common and Scientific Names of Aquatic Invertebrates from the United States and Canada - Crustaceans*. Bethesda, Maryland, U. S. A.: American Fisheries Society. 565pp.

- Morino, Hiroshi, H. Kusano, and John R. Holsinger. 2004.** Description and distribution of *Crangonyx floridanus* (Crustacea: Amphipoda: Crangonyctidae) in Japan, an introduced freshwater amphipod from North America. *Contributions from the Biological Laboratory, Kyoto University* 29: 371-381.
- Pinkster, Sjouk, Jan Dieleman, and Dirk Platvoet. 1980.** The present position of *Gammarus tigrinus* Sexton, 1939, in the Netherlands, with the description of a newly discovered amphipod species, *Crangonyx pseudogracilis* Bousfield, 1958 (Crustacea, Amphipoda). *Bulletin Zoölogisch Museum Universiteit van Amsterdam* 7(4): 33-45.
- Toft, Jason D., Jeffrey Cordell, and Wayne Fields 2002.** New records of crustaceans (Amphipoda, Isopoda) in the Sacramento/San Joaquin Delta, California, and application of criteria for introduced species. *Journal of Crustacean Biology* 22(1): 190-200.
- Tojo, Koji, Yoshiki Tanaka, Ryoichi B. Kuranishi, and Shoji Kanada. 2010.** Reproductive Biology and Adaptability of the Invasive Alien Freshwater Amphipod *Crangonyx floridanus* (Crustacea: Amphipoda, Crangonyctidae)." *Zoological Science* 27(6): 522-527.