

*PINNIXA SCAMIT*, A NEW SPECIES OF  
PINNOTHERID CRAB (DECAPODA: BRACHYURA)  
FROM THE CONTINENTAL SLOPE OFF CALIFORNIA

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*Abstract.*—A new species of the pinnotherid crab genus *Pinnixa*, *P. scamit*, is described. Collected off the coast of Pt. Arguello, California, U.S.A., at 311 m, the new species belongs to the *Pinnixa occidentalis* complex, species of which are characterized by a highly sculptured carapace, well developed cardiac ridge, and deflexed fixed fingers on the chelae. *Pinnixa scamit* differs from *P. occidentalis* in having a well developed but granular (rather than acute) cardiac ridge, and larger, more acute, slightly curved teeth along the anterolateral margin of the carapace. The most salient difference between the two species is the length of the propodus of the third walking leg (pereopod 4), which is at least 2.5 times its width in the new species.

In a recent review of crabs in the genus *Pinnixa* White, 1846, known from California, Zmarzly (1992) redescribed 11 previously recognized species and described two new species, *P. forficulimanus* and *P. minuscula*, bringing the number of species of this genus known from California waters to 13. Several of the species treated by Zmarzly were described as exhibiting significant morphological variation. In particular, Zmarzly (1992) reiterated Hart's (1982) comment that the species *Pinnixa occidentalis* Rathbun, 1893, in part because of its variability and in part because of its wide geographic and bathymetric distribution, may represent a species complex rather than a single morphologically variable species.

While examining several decapod crustacean specimens collected as part of a faunal survey of the Santa Maria Basin and western Santa Barbara Channel, conducted by the Minerals Management Service (MMS) of the U.S. Department of the Interior, we noticed two specimens that shared certain features with *Pinnixa occidentalis* Rathbun, 1893, but that did not entirely agree with the original description or Zmarzly's (1992) redescription of this spe-

cies. Subsequent examination and comparison with true *P. occidentalis* has convinced us that the differences are sufficient to warrant the erection of a new species of *Pinnixa*, which is described below. The holotype and sole paratype are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM).

*Pinnixa scamit*, new species  
Figs. 1, 2

*Material examined.*—Holotype female, USNM 267500, carapace width 7.4 mm, carapace length 3.7 mm; 29 Nov 1983; MMS station data 071-BSS-01-TX, 34°29.040'N, 120°44.013'W, western Santa Barbara Channel, just seaward of, and SSW of, Pt. Arguello, California; single core replicate; 1020 feet (311 m); 1 mm screen. Paratype juvenile, USNM 267501 (sex indeterminate), carapace width 3.4 mm, carapace length 2.1 mm, same collecting data as for holotype.

*Diagnosis.*—Carapace highly sculptured, with anterolateral ridge bearing pronounced and slightly anteriorly-curved teeth; frontal margin with deep median cleft; cardiac ridge

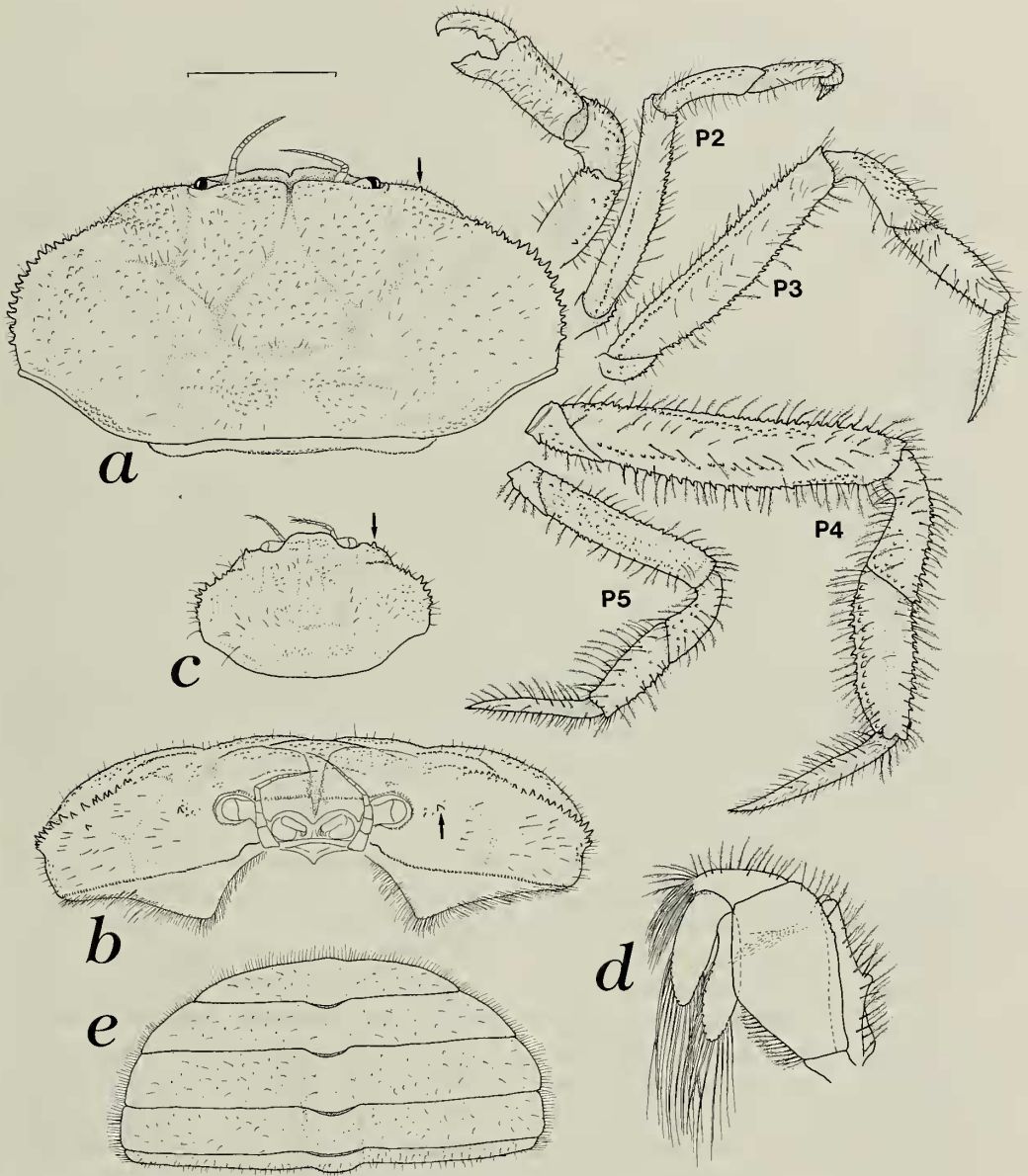


Fig. 1. *Pinnixa scamit*, female holotype, USNM 267500, and juvenile paratype, USNM 267501 (c only), western Santa Barbara Channel, California. a, female holotype, dorsal view of carapace and right side appendages, pereopods 1–3 drawn in situ, pereopods 4 and 5 removed and figured separately (to assure correct proportions); b, same specimen, frontal view showing sculpturing of carapace and subhepatic tooth (arrow); c, dorsal view of immature paratype; note that subhepatic tooth (arrow) and acute serrations along anterolateral margin are already present at this size; d, third maxilliped of holotype, left side, outer view; e, abdomen of holotype, ventral view illustrated in situ (first two segments not visible, and segment 3 shortened due to curvature of abdomen). Scale bar = 2.0 mm for a–c, e; 1.0 mm for d.

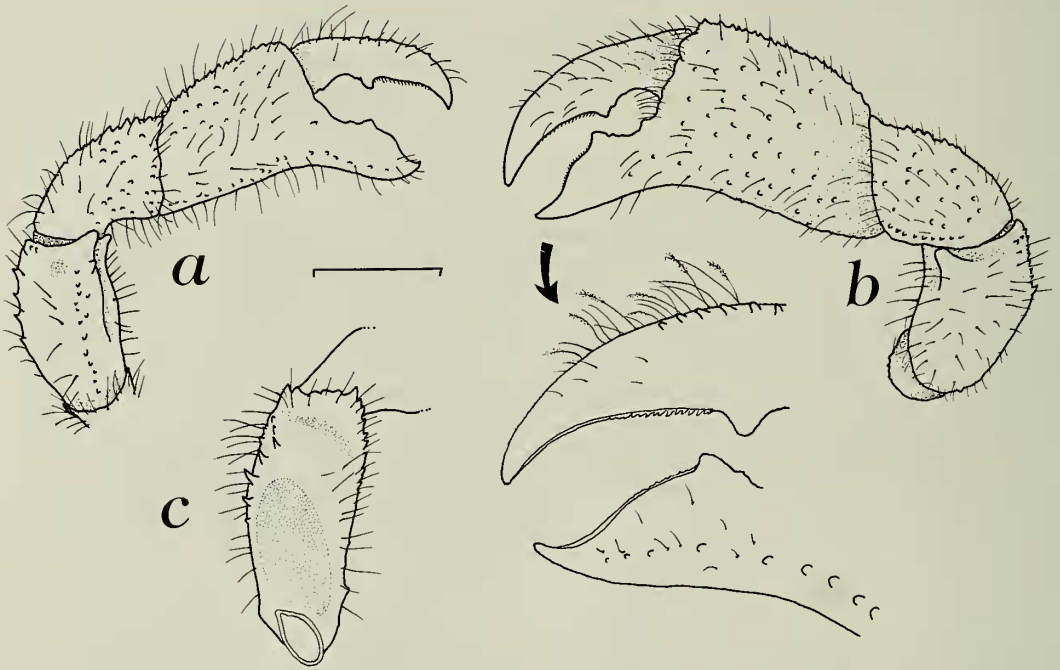


Fig. 2. *Pinnixa scamit*, female holotype, USNM 267500, chelipeds. a, right (minor) cheliped, outer view; b, left (major) cheliped, outer view, with fingers enlarged below (arrow) to show minute teeth along cutting border; length of merus and basi-ischium distorted (overly shortened) in both a and b because of orientation of illustration; c, merus of left cheliped, dorsal view, with carpus toward top of figure. Scale bar = 1.0 mm for all figures except for enlargement of b (which is not to scale).

present, granular, not sharp. Fixed finger or major cheliped slightly deflexed; both fingers of major cheliped with single stout tooth located almost at midlength on inner margin. All ambulatory pereopods with markedly serrate and setose dorsal and especially ventral margins. Propodus of pereopod 4 at least 2.5 times longer than wide.

*Description of holotype.*—Carapace (Fig. 1a, b) two times wider than long, surface with numerous granules and scattered, short setae. Carapace highly sculptured, with areolations distinct and defined by deep grooves. Frontal margin with deep median cleft. Anterolateral margins broadly arcuate, with pronounced ridge bearing well developed acute teeth, each tooth curved slightly to anterior. Subhepatic region of carapace just lateral to orbits bearing small but obvious tooth (arrow, Fig. 1a; more pronounced in juvenile paratype, Fig. 1c). Gas-

tric depression deep. Cardiac ridge well developed but granular, obtuse, not acute, slightly bilobed.

Chelipeds (Figs. 1a, 2) slightly dimorphic, left larger. Fixed finger slightly deflexed, nearly  $\frac{1}{2}$  length of palm. Opposing borders of dactylus and fixed finger of each cheliped with pronounced tooth at approximately midlength and with row of small transparent teeth merging distally into thin sharp ridge along cutting edges (Fig. 2b). Palm with scattered short setae and granules on outer surface and serrate ridge on dorsal border. Carpus and merus (Fig. 2c) with well developed acute teeth on dorsolateral and dorsodistal surfaces.

Ambulatory pereopods (Fig. 1a, where ambulatory pereopods are denoted by P2–P5) long and relatively slender compared to those in most other species of genus. Each leg with well developed row of teeth along

dorsal and ventral borders of merus, carpus, and propodus, less obvious on carpus. Dactylus of each ambulatory leg more or less straight, slightly bent to flexor side on pereopods 2 through 4, to extensor side on pereopod 5. All articles with combination of scattered short plumose and simple setae. Pereopod 4 (third walking leg) longest, with propodus 2.6 times longer than wide. Propodus of pereopod 4 with ventral margin bicarinate, each carina serrate. Dactylus of pereopod 4 slightly longer than propodus. Tip of dactylus on each walking leg not strongly curved.

Third maxilliped as figured (Fig. 1d), typical of genus. Endopod with short distally plumose setae on merus and carpus and with long smooth or sparsely setulose setae on distal half of dactylus and propodus; distal border of carpus with thick, brush-like tuft of setae. Proximal article of exopod with obvious lateral protrusion at approximately midlength and plumose setae along lateral border.

Abdomen (Fig. 1e) broadly rounded, well developed, setose, consisting of 7 free segments, only distalmost 5 visible in ventral view (Fig. 1e). Pleopods mature, well developed, and setose.

Male unknown.

*Juvenile paratype* (Fig. 1c).—Similar to holotype in the serrate anterolateral border and possession of subhepatic tooth. Ambulatory pereopods also similar to those of holotype. Paratype differs from holotype in having a slightly reduced carapace width: length ratio (a difference that we attribute to normal ontogenetic changes), a slightly more produced front, and a slightly more pronounced subhepatic tooth relative to carapace size (arrow, Fig. 1c).

*Type locality*.—Western Santa Barbara Channel, SSW of Pt. Arguello, California, 34°29.040'N, 120°44.013'W, 311 m, soft bottom.

*Distribution*.—Known only from the type locality.

*Etymology*.—The species name origi-

nates from an acronym being used as a noun in apposition. We are pleased to take the name of this species from SCAMIT, the acronym for the Southern California Association of Marine Invertebrate Taxonomists, a largely unheralded organization of professional biologists that has done much to further our knowledge of marine invertebrates in southern California.

*Remarks*.—Most California species of *Pinnixa* White, 1846, have a ridge, which may be granular to tuberculate, along the anterolateral margin of the carapace. Exceptions include *P. faba* (Dana 1851), *P. longipes* (Lockington 1876), *P. tubicola* Holmes, 1894, and *P. weymouthi* Rathbun, 1918, where an anterolateral ridge is either absent or at best very weakly developed; and *P. forficulimanus* Zmarzly, 1992, *P. minuscula* Zmarzly, 1992, and *P. littoralis* Holmes, 1894, where it is absent (Zmarzly 1992). In the remaining California species of *Pinnixa*, this ridge is obvious in dorsal view, and is sometimes as pronounced as in *P. scamit*. However, in none of the adults of these species are the individual anterolateral teeth as sharp or as anteriorly curved as in *P. scamit*. Juvenile stages of two species, *P. occidentalis* Rathbun, 1893, and *P. franciscana* Rathbun, 1918, sometimes exhibit acute teeth on the anterolateral ridge; however, this feature changes dramatically between the juvenile and adult stages. In addition, *P. scamit* has relatively slender legs with acute marginal serrations as an adult, which is also characteristic only of juvenile stages in *P. occidentalis* and *P. franciscana*. Thus *P. scamit* appears to have retained several "juvenile" characters in the adult stage.

All other California species are easily distinguished from *P. scamit* by the length: width ratio of the propodus of pereopod 4. In true *P. occidentalis* Rathbun, the species to which *P. scamit* appears to be most closely allied, the propodus of P4 is distinctly broader, nearly as broad as long. In contrast, in *P. scamit* the propodus of pe-

reio pod 4 is approximately 2.6 times longer than wide.

The geographic range is of little help in determining species affinities; the collecting locality of *P. scamit* is within the range of nearly all of the 13 California species of *Pinnixa* listed by Zmarzly (1992, fig. 1), including the wide ranging *Pinnixa occidentalis*. It is unfortunate that we do not have a male specimen, as gonopod morphology would undoubtedly help clarify the relationship between *P. scamit* and other California species. The species also shares certain morphological similarities with *Pinnixa affinis* Rathbun, 1898, known only from 26 fm (47.5 m) in Panama Bay (see Rathbun 1918: 168), but can be distinguished by the more deflexed major chela in *P. affinis* (see Rathbun 1918: fig. 106).

The extent to which some systematically important morphological characters vary in California species of *Pinnixa* is not known. A detailed knowledge of such characters as the morphology of the orbits, eyes, epistome, antennae, and mouthparts, apparently useful in resolving placement within pinnotherid species complexes in other geographic areas, is at present lacking. In-depth study of these features may resolve some of the questions of relationships within the *P. occidentalis* complex.

If the key to California species of *Pinnixa* given by Zmarzly (1992: 678) is employed, then the new species would key to *P. occidentalis*. For separation of the species, we suggest insertion of the following couplet, to replace couplet 8 in Zmarzly's key.

- 8. Fixed finger of chela straight or curving upward, not deflexed . . . . . 9 (as in original key)
- Fixed finger of chela deflexed, angled obliquely downward relative to line delineated by ventral margin of palm (deflection stronger in males than in females) . . . . . 8A
- 8A. Length of propodus of pereio pod

- 4 at least 2.5 times width . . . . .
- . . . . . *P. scamit*, new species
- Length of propodus of pereio pod
- 4 approximately 1.5–2.0 times width *P. occidentalis* Rathbun, 1893

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