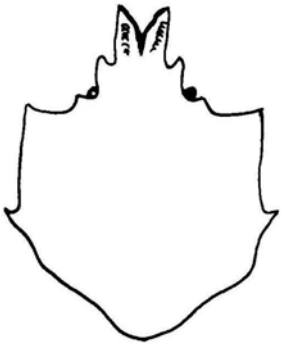
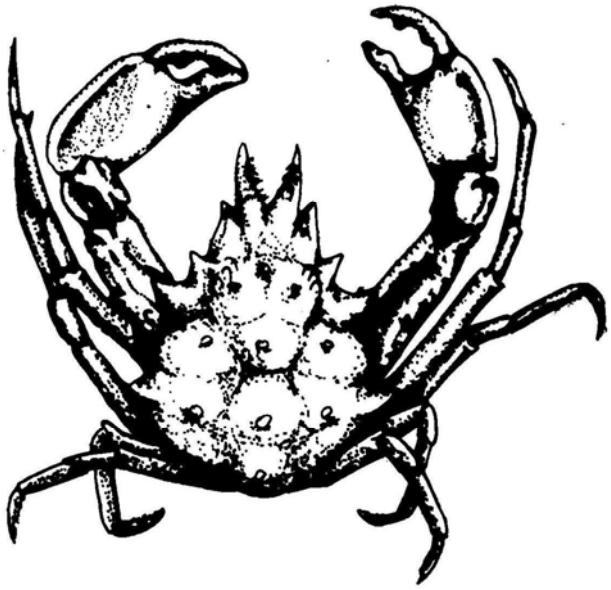
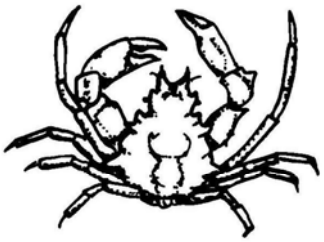


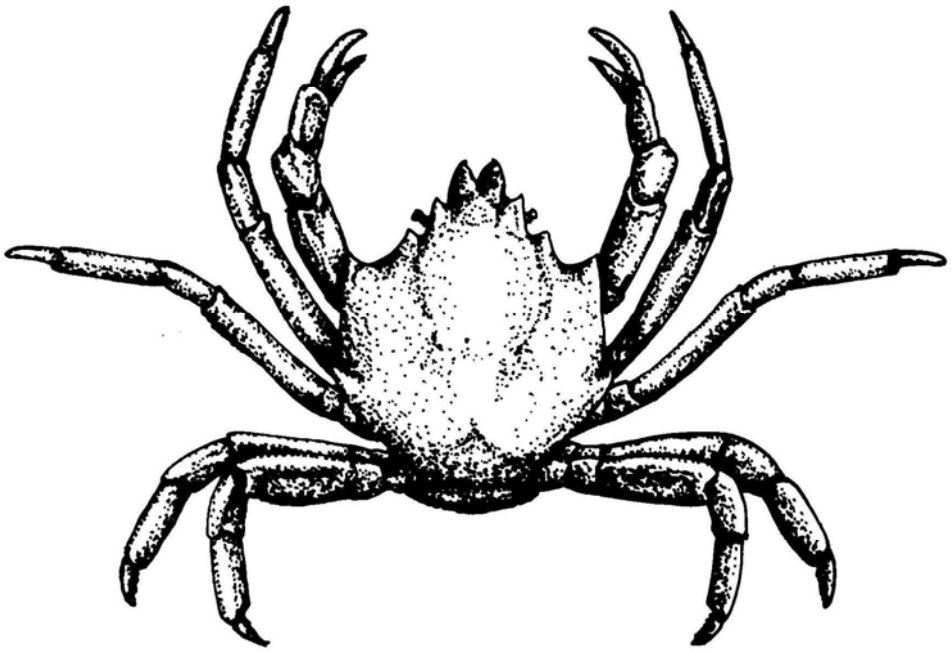
Pugettia gracilis



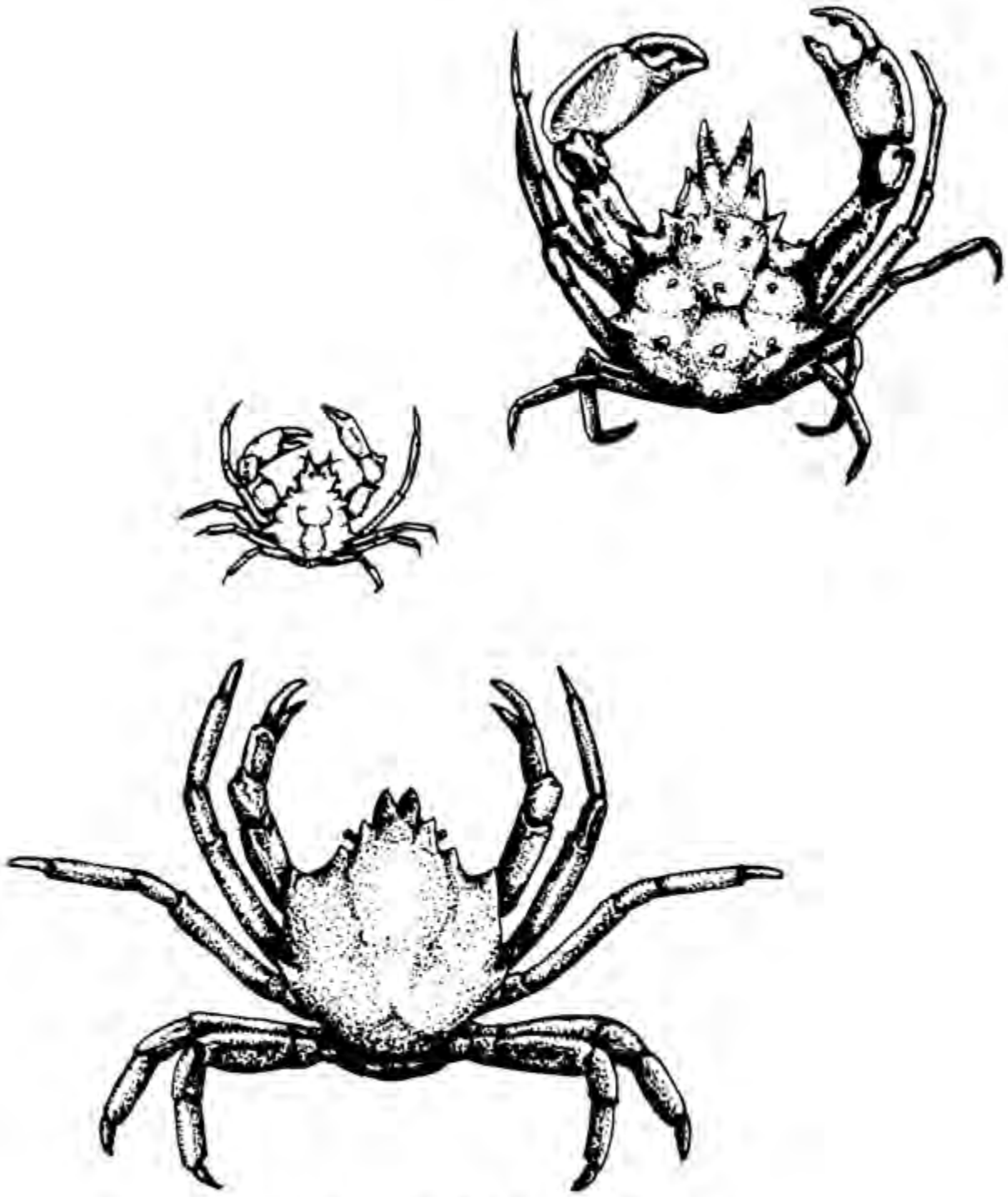
Pugettia richii



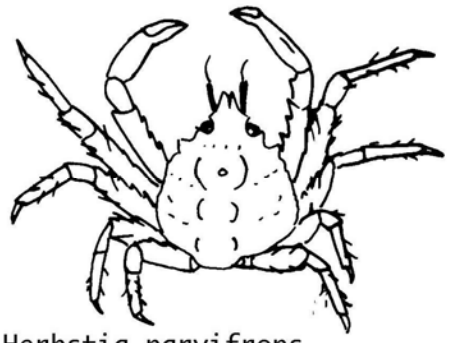
Pugettia dalli



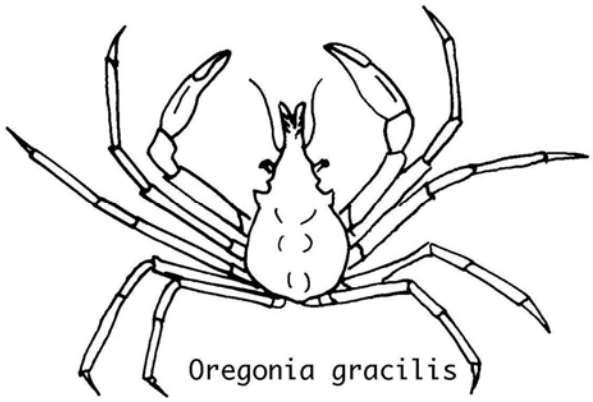
Pugettia producta



Top right: Pugettia richii; middle, P. dalli; lower, P. producta

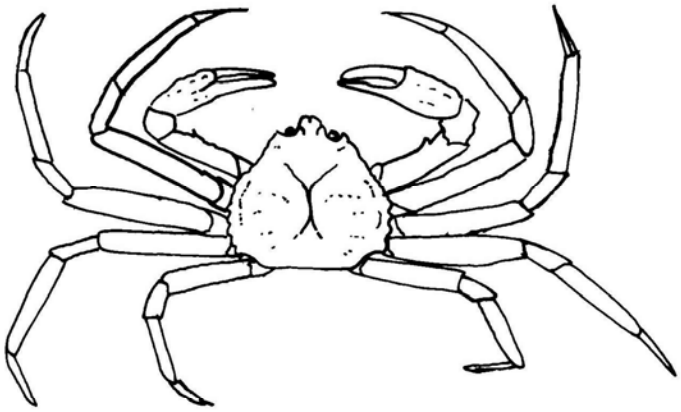


Herbstia parvifrons

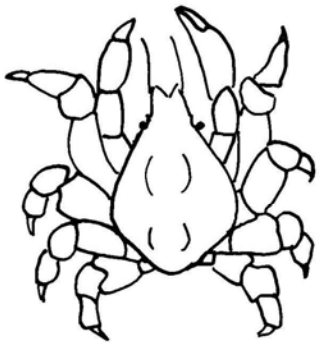


Oregonia gracilis

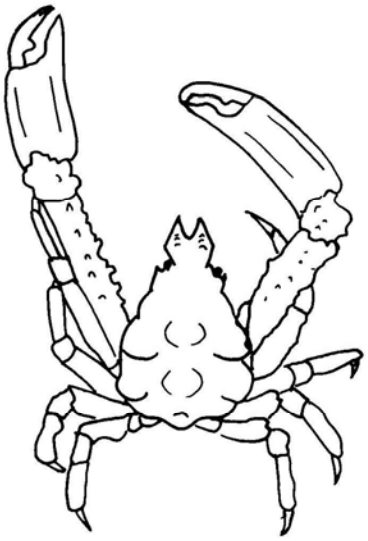
Chionoecetes angulatus



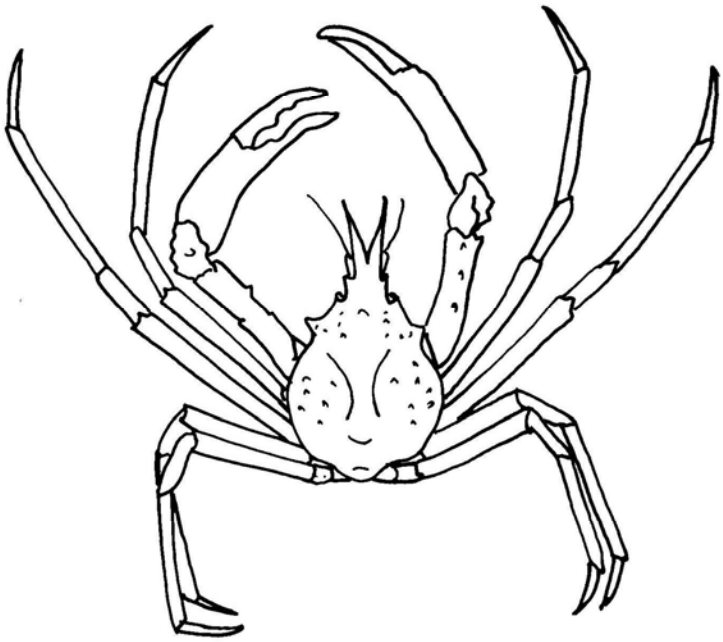
Chionoecetes tanneri



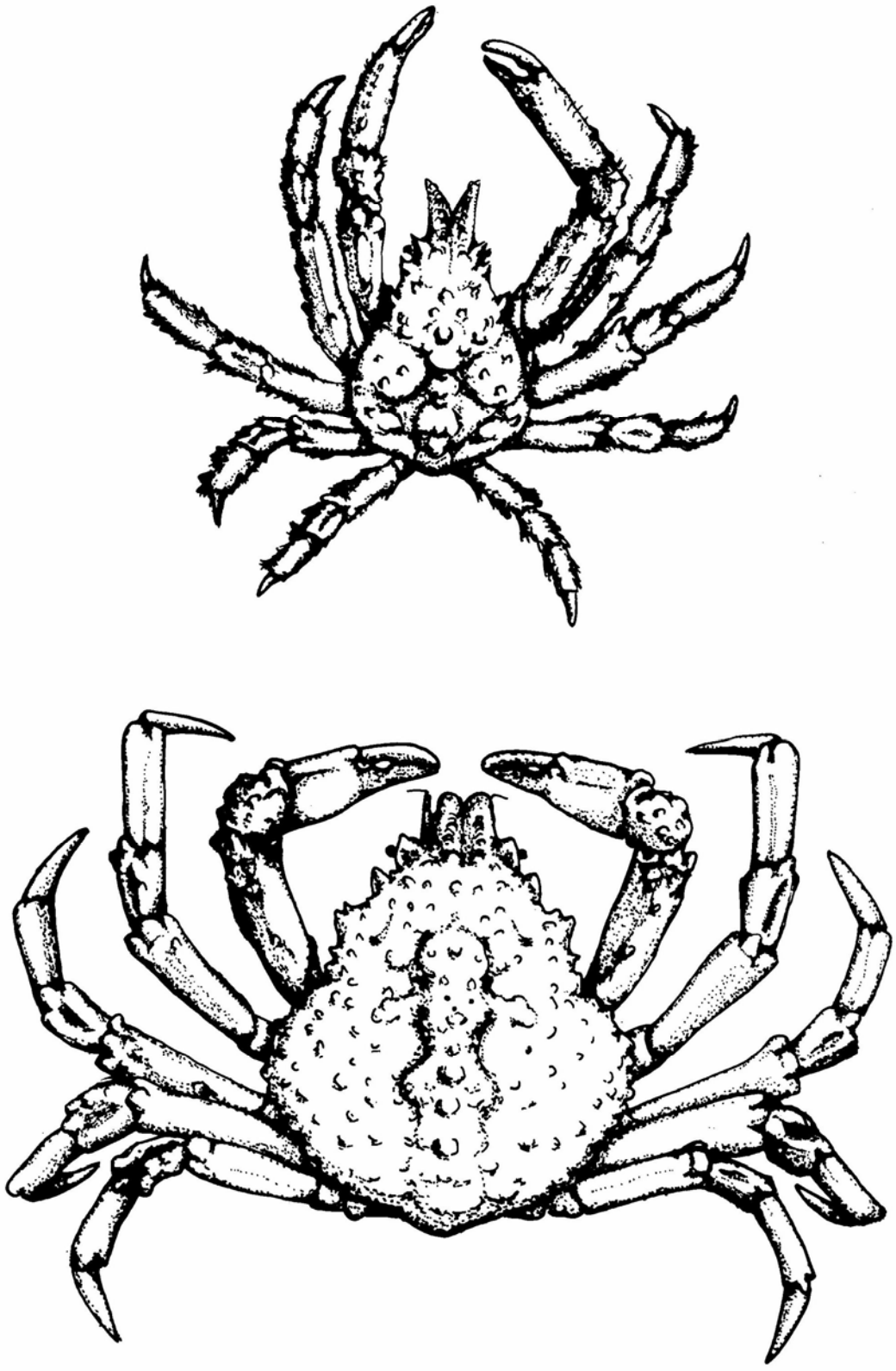
Pelia tumida



Scyra acutifrons



Chorilia longipes



Upper: Loxorhynchus crispatus; lower, L. grandis

Genus Erileptus Rathbun

Erileptus spinosus Rathbun

Erileptus spinosus Rathbun, 1893: 227.--Holmes 1900: 21.--Rathbun 1904: 171, pl. 10, fig. 1.--Rathbun 1925: 68, pls. 212, 213, text-fig. 18.--Garth 1958: 91, pl. E, fig. 8, pl. 5, fig. 2.—Hendrickx 1999: 12, fig. 5.
Anasimus spinosus.--Schmitt 1921: 196, text-figs. 121a, 121b.

Recognition characters.--Strongly sexually dimorphic. Male with slender, spinulous rostrum, about 0.5X length of postfrontal portion of carapace. Carapace spinulous; 2 spines on median line; one long spine on branchial region with small spine in front of it and two on margin; spine on margin of hepatic region and 2 very small ones arranged transversely on gastric region; slender spine on orbital arch. Postorbital spine small, distant from eye. Abdomen with spine on first segment. Chelipeds nearly 3X long as carapace, granulate; merus with one spine at anterior margin; hand slender, slightly flattened vertically, fingers gaping. Ambulatory legs very slender, decreasing regularly in length from first to fourth. Female with slender, upcurved, spinulous rostrum. Carapace with 2 median spines, 2 spines on each branchial region and one on each protogastric region, lateral margins spinulous, surface pubescent. Prominent supraorbital spine. Abdomen with spine on first segment and smaller spine on second segment. Chelipeds weak, margins of merus spinulous, slender spine near carpus; hand slender, granulous; fingers in contact. Ambulatory legs slender and pubescent, decreasing in length from first to fourth. Dactyls of ambulatory legs slender and spinulous in both sexes. Male carapace length 11 mm, width 6.8; female carapace length 5.7, width 4.0.
Color in life.--Dull brown to grayish.
Habitat.--Usually shelly sand, often in steeply-sloping areas, 4-554 m.
Range.--San Miguel Island, California to Magdalena Bay, Baja California; Gulf of California from Rocky Point, Sonora to Isla Cardones, Panama. Type locality off San Diego, California.
Remarks.--This small crab is especially common on "shell hash" bottoms along the islands of southern California.

Genus Podochela Stimpson

Podochela hemphillii (Lockington)

Microrhynchus hemphillii Lockington, 1877: 30.
Podochela hemphillii.--Holmes 1900: 17.--Rathbun 1904: 1717, pl. 10, fig. 2.--Schmitt 1921: 195, text-fig. 120.--Rathbun 1925: 49, pl. 18; pl 209, fig. 2.
Podochela hemphilli.--Garth 1958: 104, pl. H, fig. 6, pl. 7.--Ricketts et al. 1985: 420.—Hendrickx 1999: 28, fig. 15.

Recognition characters.--Rostrum broad to acutely triangular, variable in length, ending in spine, with hooked setae. Carapace pyriform; gastric region prominent, rounded, and bearing hooked setae; hepatic regions bearing 2 pointed tubercles; cardiac region separated by shallow grooves from branchial and bearing prominent elevation; branchial regions flattened or raised. No supraorbital tooth or spine, no tooth at posterior margin of orbit but sometimes small one short distance behind orbit. Eyestalks constricted at middle. Basal antennal article with longitudinal

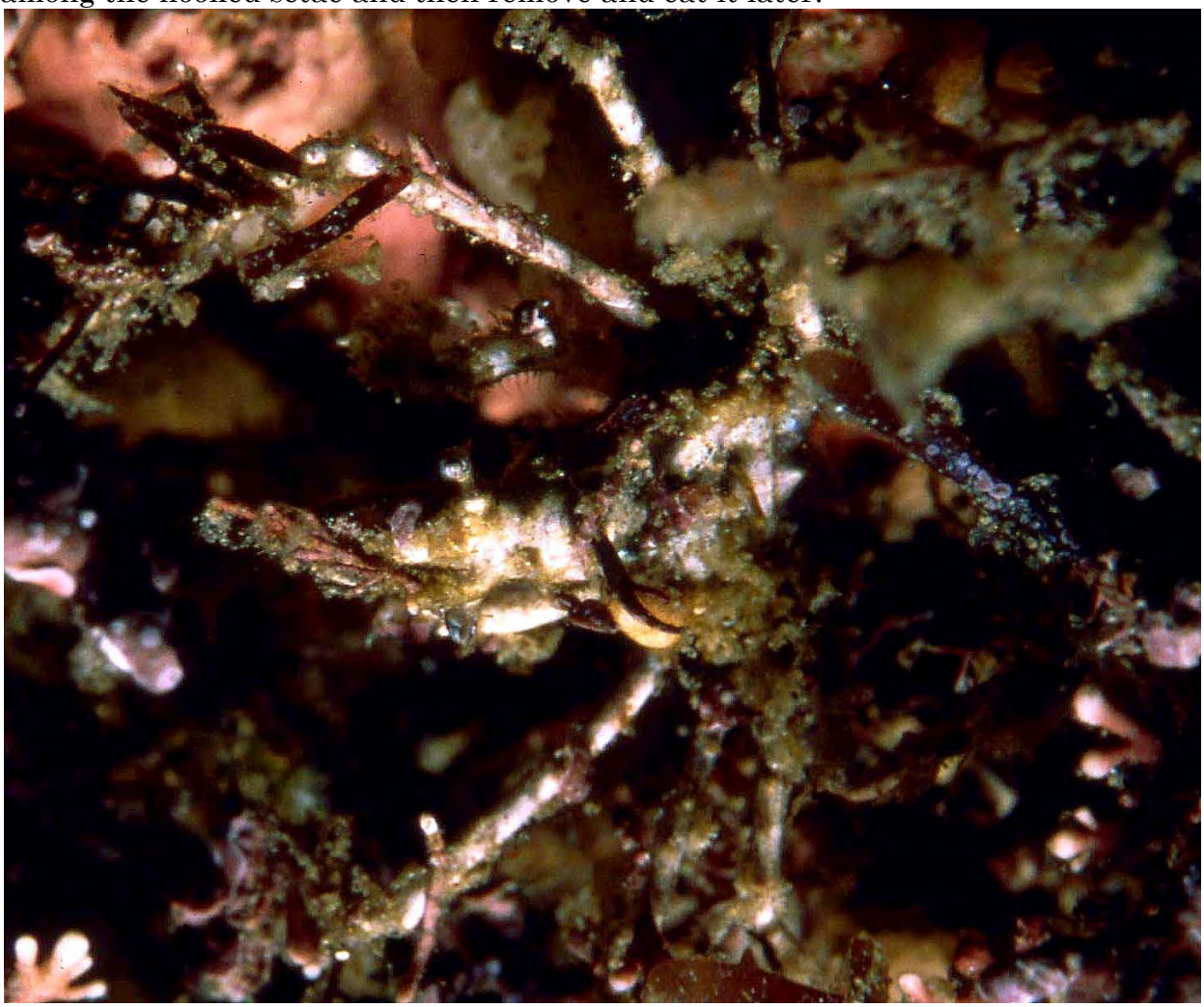
ridge on posterior half or two-thirds with groove on either side. Male with robust chelipeds, merus incurved and having outer spiny ridge; carpus with posterior spine on upper side, hand oblong, palm inflated, fingers gaping at base. Female chelipeds smaller, slender, fingers nearly straight. Ambulatory legs long and slender, furnished with hooked setae, dactyls slender and curved. Abdomen of male six-segmented, narrow; female abdomen with five segments and rounded; female sternum and ventral surface of abdomen hollowed out. Male carapace length 34 mm, width 22.4; female carapace length 18.5 mm, width 11.5.

Color in life.--Dorsal surface of carapace pale olive buff with band of carmine along each side, two patches of carmine on cardiac region and two smaller patches on intestinal region. Chelipeds yellowish cream. Ambulatory legs marked with carmine. Lower body surface creamy white.

Habitat.--Docks, pilings, among low-growing algae on rocks, sand; shore to 166 m but usually at 100 m or less.

Range.--Monterey Bay, California to Magdalena Bay, Baja California; Angel de la Guardia Island, Gulf of California to Cape Corrientes, Colombia. Rarely reported north of San Miguel Island, California. Type locality San Diego Bay, California.

Remarks.-Podochela hemphillii frequently is covered by algae, hydroids or bryozoans which may be attached perpendicular to the axis of the ambulatory legs. The crab may store edible material among the hooked setae and then remove and eat it later.



Podochela hemphillii

Podochela lobifrons Rathbun

Podochela lobifrons Rathbun, 1893: 226.--Garth 1958: 116, pl. H, fig. 1; pl. 8, fig. 1.—Hendrickx 1999: 34, fig. 19.
Podochela barbarensis Rathbun, 1924: 1.--Rathbun 1925: 54, p. 20, figs. 3,4, text-fig. 13.

Recognition characters.--Rostrum a long, slender spine, 0.5-0.6X postrostral carapace length. Carapace setose; cardiac region with large conical elevation; 2 median gastric tubercles, prominent strap-shaped spine on hepatic region and small, similar one on pterygostomian ridge, small postorbital spine, orbital arch finely spinulous. Antennae overreaching rostrum, movable articles of peduncle slender, basal article with spinulous outer margin. Two blunt median tubercles on first segment of abdomen. Chelipeds spinulous and setose, spine at outer distal margin of merus, knob on outer surface of carpus, chela widest behind middle of palm, one tooth on finger of cheliped at midle of gape. First ambulatory legs up to 3X carapace length, very slender, dactyl very slender. Second-fourth ambulatory legs with curved dactyls. Male carapace length 21.5 mm, width 12.5; female carapace length 18.3 mm, width 10.9.
Color in life.--Brown, chelipeds banded with red.
Habitat.--Sand, rocks and among algae, 2-230 m.
Range.--Point Mugu, California to San Cristobal Bay, Baja California; Angel de la Guardia Island to outer Gorda Bank, Gulf of California. Type locality off Abreojos Point, Baja California.
Remarks.--Podochela lobifrons usually occurs deeper than P. hemphilli. Freshly caught specimens often are coated with mud, foraminiferans and debris.

Genus Epialtoides Garth

Epialtoides hiltoni (Rathbun)

Epialtus bituberculatus Rathbun, 1894: 67 (in part).--Schmitt 1921: 203 (not text-fig. 126). (Not Epialtus bituberculatus Milne-Edwards, 1834, western Atlantic species).
Epialtus hiltoni Rathbun, 1923: 72.--Rathbun 1925: 156, pl. 46, figs. 1,2, text-figs. 53 m,n.
Epialtoides hiltoni.--Garth 1958: 234, pl. O, fig. 7; pl. 26, fig. 3.--Garth and Abbott 1980: 597, fig. 25.2.—Hendrickx 1999: 93, fig. 53.

Recognition characters.--Rostrum oblong, tip bilobed; deeply emarginate in young animals. Carapace high in median region, lateral wings broad, ascending, anterior lobe larger, intervening sinus deep. Posterior margin of hepatic lobe convex. Preorbital tooth outstanding, postorbital tooth inconspicuous. Male and female with 5 free abdominal segments. Male chelipeds of moderate size, merus bluntly angled, carpus and manus with subacute outer carina, tubercle on upper surface of carpus, outer margin of fingers with carina, large tooth on dactyl within narrow gape. Female with less massive cheliped, merus and manus foreshortened. Ambulatory legs rather stout, 2 tubercles on lower margin of merus of first leg, dactyls with spinules. Male carapace length 17.3 mm, width 15.7; female carapace length 10.7 mm, width 9.6.
Color in life.--Camouflaged like brown algae; brown, olive, mottled with dark brown or cream.
Habitat.--Among low-growing algae, in kelp holdfasts of among surf grasses (Phyllospadix spp.), shore-5 m.
Range.--Santa Catalina Island, California to Magdalena Bay, Baja California. Type locality Laguna Beach, California.

Remarks.--Epialtoides hiltoni may attach bits of algae to its rostrum. This crab may be abundant, but its small size and cryptic coloration renders it inconspicuous.

Epialtoides hiltoni

Genus Taliepus A. Milne-Edwards

Taliepus nuttalli (Randall)

Epialtus nuttallii Randall, 1839: 109.--Holmes 1900: 23.--Rathbun 1904: 173.--Schmitt 1921: 202, text-fig. 125.
Taliepus nuttallii.--Rathbun 1925: 162, pls. 50, 51; text-fig. 61.--Garth and Abbott 1980: 597, fig. 25.3--Ricketts et al. 1985: 136.
Taliepus nuttalli.--Garth 1958: 208, pl. L, fig. 8; pl. 22.—Hendrickx 1999: 117, pl. 2D, 3A, B.

Recognition characters.--Rostrum with convergent sides, inclined downward, with triangular notch at apex. Carapace ovate, convex, smooth. No preorbital tooth, postorbital tooth small. Antennae not reaching end of rostrum. Seven free abdominal segments in both sexes. Male cheliped stout, unarmed, fingers gaping, margins of fingers with row of low teeth; female cheliped more slender, fingers not gaping. Ambulatory legs stout, subcylindrical, dactyls strongly curved, with 2 rows of spinules on dactyls. Male carapace length 106 mm, carapace wdith 92; female approximately half this size.
Color in life.--Juvenile camouflaged like algae, olive-green to reddish; adults red-brown to dark purple.
Habitat.--Shore to 92 m, but usually less than 50 m; rocky shores, kelp beds, especially among brown algae.
Range.--Santa Barbara, California to Magdalena Bay, Baja California. Type locality "Upper California".

Genus Mimulus Stimpson

Mimulus foliatus Stimpson

Mimulus foliatus Stimpson, 1860: 200, pl. 5.--Holmes 1900: 23.--Rathbun 1904: 173.--Schmitt 1921: 204, fig. 127a, 127b.--Rathbun 1925: 182, pl. 60, text-figs. 70,71.--Garth 1958: 183, pl. L, fig. 1; pl. 25, fig. 3.--Carlton and Kuris 1975: 395, pl. 96, fig. 46.--Garth and Abbott 1980: 600, fig. 25.8.--Ricketts et al. 1985: 170, fig. 138.

Recognition characters.--Rostral horns flattened, notch between them triangular, rows of hooked setae on rostrum. Carapace flattened, median region with 2 small tubercles; lateral margin bearing broad, leaflike expansions divided by narrow fissure. Hooked setae present on median region of small crabs. Preorbital tooth large, triangular, acute; postorbital tooth small and pointing obliquely downward. Peduncle of antennae reaching about to tip of rostrum. Male and female abdomens with seven free segments. Male cheliped large, merus rough, carpus with ridge on inner margin, hand with fingers bent downward and curved inward, gaping near base but distally with small teeth. Female cheliped smaller, without prominent ridge on merus, fingers not gaping, dentate along entire margin. First ambulatory legs longer than following legs. Propodus of all ambulatory legs with setose tooth near middle of inferior margin. Male carapace length 23.4 mm, width 39; female carapace length 19.3 mm, width 32.4.
Color in life.--Carapace highly variable: reddish, rose-red, purple, tan and marked with stripes, white with brick-red rostrum, red-brown with white "V" mark to orange. Legs reddish with white bands; male cheliped reddish or white with red fingers.
Habitat.--Among rocks and algae, shore to 129 m but usually at 30 m or less.
Range.--Unalaska, Alaska to San Diego, but uncommon south of Point Conception, California. Type locality off Monterey, California.
Remarks.--Mimulus foliatus may attach bits of algae to its carapace. Large individuals may have encrusting sponges or bryozoans on the carapace. This species is very common among coralline algae and kelp holdfasts.

Mimulus foliatus

Genus Pugettia Dana

Pugettia venetiae Rathbun

Pugettia venetiae Rathbun, 1924: 2.--Rathbun 1925: 180, pl. 59, figs. 5-7, text-figs. 68, 69.--Garth 1958: 204, pl. L, fig. 5, pl. 21, fig. 2.—Hendrickx 1999: 113, fig. 66.

Recognition characters.--Rostral horns long, acute, divergent. Carapace tuberculate and spinous, with 4 gastric, 2 lateral, one cardiac, 3 intestinal and 4-5 branchial tubercles, one branchial and

2 hepatic lateral spines. Postorbital spine slender. Supraocular eave less expanded over eye than in related species. Preorbital spine large, directed forward, antennal spine visible in front of it. Basal antennal article having anteroexternal spine and 2 smaller spines. Male chelipeds about as long as carapace, ischium with spine on inner margin, merus with spines on inner, upper and outer margins, carpus with 2 spines on inner margin and 4 on outer margins, palm with spinules on upper surface, fingers narrow, deflexed and toothed, narrow gape at base. Female cheliped shorter and similar, fingers not gaping. Ambulatory legs subcylindrical, dactyls with two rows sharp spinules. Much of dorsal surface of both sexes setose. Male carapace length 16.2 mm, width 10.7; female length 23.9 mm, width 17.3.
Color in life.--Rostrum, frontal region and chelae dull orange. Carapace gray-tawny brown with white and lavendar marks. Fingers of chela purple-brown at base, becoming orange-red and fading to white at tips. Ambulatory legs brownish orange, banded. Ventral surface dull lilac on abdomen and orange on front.
Habitat.--Sand and shell, rock, 9-120 m, usually at 90 m or less.
Range.--San Miguel Island, California to Magdalena Bay, Baja California. Type locality off Newport Beach, California.
Remarks.--Specimens of P. venetiae are unusual for spider crabs in being relatively clean of attached material.

Pugettia dalli Rathbun

Pugettia dalli Rathbun, 1893: 232.--Holmes 1900: 26.--Rathbun 1904: 173, pl. 2, figs. 1, 1a.--Rathbun 1925: 178, pl. 59, figs. 1-4, text-fig. 67.--Garth 1958: 199, pl. L, fig. 6, pl. 21, fig. 1.—Hendrickx 1999: 107, fig. 62.

Recognition characters.--Rostral horns slender, divergent. Carapace subtriangular, more rounded in females than males; with hooked setae and covered with small prominences. Large tubercle on cardiac region, intestinal region and each protogastric lobe; female with swollen gastric region. Lateral carapace margin with slender hepatic spine and stout and upturned branchial spine. Preorbital tooth sharply pointed. Postorbital tooth thin, obtuse, upper surface flattened into smooth oval lobe. Antennae exceeding rostrum; large lobe on outer margin of basal article. Male cheliped strong, merus with thin and irregular ridge on margins, carpus with strong ridge above and on inner margin, hand large, compressed, margins thin, fingers gaping, tooth near base of dactyl. Female cheliped similar but with slender chela, fingers in contact. Ambulatory legs slender, first pair as long as or longer than chelipeds, remaining legs shorter, margins fringed with coarse setae. Male carapace length 18.0 mm, width 13.8; female carapace length 14.6 mm, width 10.3.
Color in life.--Reddish to brown, similar to algae.
Habitat.--Among algae and sea grasses, open coasts and harbors, intertidal to 118 m but usually at less than 50 m.
Range.--San Miguel Island, California to Thurloe Bay, Baja California. Type locality "Southern California" (probably Catalina Harbor, Santa Catalina Island, based on records of other specimens examined by Rathbun).
Remarks.--Pugettia dalli is common, but small and cryptic. It can be collected in abundance among low-growing algae and holdfasts. These crabs decorate themselves life-long with pieces of algae, bryozoans and hydroids.

Pugettia dalli

Pugettia producta (Randall)

Epialtus productus Randall, 1839: 110.--Holmes 1900: 22.--Rathbun 1904: 173.--Schmitt 1921: 201, text-fig. 124.
Pugettia producta.--Rathbun 1925: 167, pls. 56, 57, text-figs. 62, 63.--Garth 1958: 188, pl. L, fig. 2, pl. 19.--Carlton and Kuris 1975: 395, pl. 97, fig. 56.--Garth and Abbott 1980: 598, fig. 25.4.—Wicksten and Bostick 1983: 364.--Ricketts et al. 1985: 134, fig. 106.—Hendrickx 1999: 110, pl. 2B.

Recognition characters.--Rostrum deeply notched, with hooked setae on horns. Carapace smooth, sides subparallel, with large hepatic tooth broadly but distantly joined with postorbital; large tooth midway between anterolateral tooth and posterior margin; posterior margin with strong convexity in middle. Newly-settled crabs bearing tufts of coarse setae on lateral margins of carapace. Small preorbital and postorbital tooth. Male chelipeds stout, shorter than first ambulatory legs, carpus with outer ridge, hand long and narrow but inflated in largest individuals; fingers slender, bent downward and curved inward, inner margins dentate, gaping in largest males; female cheliped more slender. Ambulatory legs decreasing in length posteriorly, dactyls slender and with spinules. Male carapace length 71 mm, width 62; female carapace length 69 mm, width 59.

Color in life.--Camouflaged like algae; light olive-green to almost black. Ventral surface yellowish in juveniles and females, brilliant red in mature male. (Color may depend on age, nearness to next molt and uptake of pigments from algal food).
Habitat.--Wharves, docks, pilings, kelp beds, tidepools, eel grass flats, beds of brown algae (especially Egregia spp.) Intertidal to 74 m, but usually shallow and near shore.
Range.--Prince of Wales Island, Alaska to Point Asuncion, Baja California. Type locality "Upper California".
Remarks.--Pugettia producta is the largest and most easily observed of the kelp crabs. The crab may store bits of algae on the rostrum, and later remove and eat the algae. Kelp crabs may move from place to place during the year to feed on algae or mate.

male Pugettia producta


juvenile Pugettia producta

Pugettia gracilis Dana

Pugettia gracilis Dana, 1851.--Holmes 1900: 25.--Rathbun 1904: 173.--Schmitt 1921: 206, pl. 33, fig. 7, text-figs. 128a, 128b.--Rathbun 1925: 172, pl. 58, text-figs. 64, 65.--Garth 1958: 196, pl. L, fig. 4, pl. 20, fig. 2.--Carlton and Kuris 1975: 395.--Garth and Abbott 1980: 598, fig. 25.5.--Ricketts et al. 1985: 298.

Recognition characters.--Rostrum deeply notched, outer margins of rostral horns subparallel. Carapace oval, with 2 gastric, one cardiac and one intestinal tubercles; tuft of setae preceeding each tubercle, hooked setae on rostrum and sides of carapace. Lateral projections of carapace broad, anterior one large and winglike, posterior projection smaller with anterior end lobiform and posterior end spiniform. Hepatic tooth broad and completely joined to postorbital tooth. Basal article of antennae bearing tooth at anteroexternal angle, flagellum not reaching end of rostrum. Chelipeds large and strong, merus triangular, with superior crest bearing 3 or more teeth; carpus with 2 longitudinal crests, propodus with superior crest and inferior margin with prominent posterior lobe; male chela with fingers widely gaping, large tooth near base of dactylus; female fingers not gaping. Ambulatory legs stout, with small tubercles, dactyls with sharp tips. Male carapace length 35.5 mm, width 26.5; female carapace length 33.5 mm, width 25.0.
Color in life.--Greenish brown, yellow or reddish, ventral side lighter.
Habitat.--Docks, pilings, among rocks and algae, eel grass beds.
Range.--Attu Island (Aleutian Islands) to Monterey Bay, California, but usually north of San Francisco. Type locality Puget Sound, Washington.
Remarks.--Pugettia gracilis usually has little material attached to its dorsal surface.

Pugettia richii Dana

Pugettia richii Dana 1851: 268.--Holmes 1900: 24.--Rathbun 1904: 173.--Schmitt 1921: 207, pl. 33, fig. 6, text-fig. 129.--Rathbun 1925: 176, text-fig. 66.--Carlton and Kuris 1975: 395.--Garth and Abbott 1980: 599, fig. 25.6.—Hendrickx 1999: 111, pl. 2C.
Pugettia richi.--Garth 1958: 193, pl. L, fig. 3, pl. 20, fig. 1.

Recognition characters.--Rostrum with long horns, deep notch and hooked setae. Carapace ovate, tuberculate, constricted at base of hepatic tooth, broader in female than in male. Median region of carapace with three anterior tubercles in row and one somewhat anterior to them; rows of hooked setae near lateral tubercles, cardiac and intestinal regions with tubercle each, 2 tubercles on branchial region, posterior margin of carapace markedly convex. Supraorbital tooth acute and directed forward, postorbital tooth acute and triangular, large, slender tooth posterior to postorbital tooth, prominent pointed tubercle and posterolateral margin of carapace, spine on subbranchial region, pterygostomian region with 3-6 small teeth. Flagella of antennae visible near rostrum. Male chelipeds larger and more robust than those of female; merus with tubercles and ridge along inner side in adult, carpus with 2-3 ridges, especially in adult, hands compressed, fingers gaping in adult. Female chelipeds more slender, fingers not gaping. Ambulatory legs subcylindrical, dactyls sharp. Male carapace length 44 mm, width 36; female carapace length 33 mm, width 26.5.
Color in life.--Bright to dark red, matching red algae. Legs banded.
Habitat.--Tidepools, docks, pilings and among algae and sea grasses; intertidal to 98 m but usually in shallow areas near shore.
Range.--Prince of Wales Island, Alaska to San Geronimo Island and Asuncion Bay, Baja California. Type locality "California", possibly San Diego.
Remarks.--Pugettia richii decorates heavily throughout its lifespan. The crab may be covered by pieces of algae, hydroids or bryozoans, often with long "streamers" of material projecting forward from the rostrum.

Pugettia richii

Genus Oregonia Dana

Oregonia gracilis Dana

Oregonia gracilis Dana 1851: 270.--Holmes 1900: 19.--Rathbun 1904: 171.--Schmitt 1921: 198, text-figs. 122a, 122b.--Rathbun 1925: 71, pls. 24, 25, text-figs. 19, 20.--Garth 1958: 136, pl. I, fig. 2, pl. 10, pl. 11, fig. 1.--Carlton and Kuris 1975: 395.--Ricketts et al. 1985: 298, 334.

Recognition characters.--Rostrum with two long, slender contiguous spines and rows of hooked setae. Carapace subtriangular, setose and covered by porminences, broader in female than male. Prominence on anterior side of eye peduncle. Postorbital spine remote from eye, acute, directed outward. Septum between first antennae produced into spine. Chelipeds of male robust, those of female more slender, exceeding length of ambulatory legs, merus subcylindrical and tuberculate, carpus rounded, hand long and slender, fingers slender, smooth and incurved. Ambulatory legs cylindrical and decreasing in length posteriorly, dactyls long, tipped by claws. Male carapace length 65.7 mm , width 39; female carapace length 27.5-44.6 mm, width 165.
Color in life.--Tan or gray, red marking on chelae.
Habitat.--Among algae, eel grass and pilings, intertidal to 390 m but usually subtidal in California and Oregon.
Range.--Bristol Bay, Bering Sea to Monterey Bay, California; also Japan; rarely found south of Point Arena, California. Type locality Puget Sound, Washington.

Remarks.--Oregonia gracilis decorates heavily with bits of algae, hydroids, bryozoans, sponges and wood chips.

Genus Chionoecetes Kroyer

Chionoecetes tanneri Rathbun

Chionoecetes tanneri Rathbun, 1893: 76, pl. 4, figs. 1-4 (in part).--Holmes 1900: 40.--Rathbun 1904: 174.--Schmitt 1921: 210, text-fig. 131.--Rathbun 1925: 243, pls. 88, 89, 234.--Garth 1958: 156, pl. I, fig. 8; pl. 16, fig. 2.—Hendrickx 1999: 49, pl. 1A, C.

Recognition characters.--Rostrum short, with wide space between horns, horns slightly upturned, hooked setae present in newly-settled juvenile only. Carapace broad, swollen at branchial regions, spinous; space between branchial regions deep. Outer spine of branchial row as large as outer spine of transverse row and directly in front of it, another row of spines forming lateral supramarginal border of branchial region; spines continuing of pterygostomian region and branchial region; irregular row of small spines crossing gastric region. Orbits, outer margin of postorbital teeth and inferolateral and posterior margins of carapace armed with spinules. All spinules may be blunt in very large crabs. Male cheliped much longer than that of mature female, palm swollen, fingers long and curved. Ambulatory legs flattened, armed with spines, dactyls long and flat. Male carapace length 31 mm, width 29; female carapace length 31 mm, width 29.1.
Color in life.--Bright scarlet, tips of appendages yellow.
Habitat.--Green mud, fine gray sand, 54-1960 m but usually between 200-500 m on continental slopes; may migrate vertically along bottom during year.
Range.--Bering Sea to off Coronado Islands, Baja California. Type locality Gulf of the Farallones, California.
Remarks.--The Tanner crab is edible, and is the object of a fishery off Oregon. Unlike other majids, species of Chionoecetes have a relatively thinner and more flexible exoskeleton in relation to their musculature, and yield more meat per unit of volume than other large spider crabs.

Chionoecetes tanneri

Chionoecetes angulatus Rathbun

Chionoecetes angulatus Rathbun, 1893: 76 (in part).--Rathbun 1925: 247, pls. 90, 91.--Garth 1958: 159, pl. I, fig. 7; pl. 16, fig. 1.

Recognition characters.--Rostrum small, teeth wide and inclined upward. Carapace broad, spinulous, pubescent, lateral margins partially concealed by expanded branchial regions; space between branchial regions shallow. Dorsal ridges of branchial region converging in straight lines and meeting in acute angle marked by large spine. Male cheliped longer than that of female; palm inflated, fingers narrow and curved. Ambulatory legs flattened, meri little dilated; dactyls long and slender. Male carapace length 24.6 mm, width 23.3; female carapace length 26.4 mm, width 24.8.
Color in life.--Not reported.
Habitat.--Green mud, fine black sand; 90-3000 m but usually on continental slope.
Range.--Bering Sea off Pribilof Islands to northwest of Cape Blanco, Oregon. Type locality south of Pribilof Islands.

Genus Herbstia Milne-Edwards

Herbstia parvifrons Randall

Herbstia parvifrons Randall, 1839: 107.--Holmes 1900: 38.--Schmitt 1921: 215, text-fig. 135.--Rathbun 1925: 296, pl. 106, text-fig. 99.--Garth 1958: 316, pl. 8, fig. 5; pl. 34, fig. 2.--Garth and

Abbott 1980: 602, fig. 25.13.—Hendrickx 1999: 124, pl. 4B, D.

Recognition characters.--Rostral horns short, notch shallow. Carapace ovate, tuberculate, flattened and setose, gastric region with 4 inconspicuous tubercles in transverse row and median tubercle on posterior portion; 3-4 small tubercles on cardiac region, and 5 on each branchial region; 2 tubercles in transverse line on intestinal area, intestinal area projecting slightly beyond posterior marginal level. Preorbital spine present, acute; 2 small spines at margin of orbit between preorbital and postorbital spines; anterolateral margin of carapace provided with postorbital spine and 5 other spines, and several smaller ones above these and on posterior margin. Three subhepatic spines and row of 5-6 pterygostomian spinules. First movable segment of antenna short, not reaching tip of rostrum. Male cheliped more robust than ambulatory legs and exceeding length of first leg; female cheliped more slender. Merus with 5 larger spines on superior inner margin and numerous smaller external spine; carpus with 10-11 spinules; hand with 5-6 blunt spines on superoproximal border, male dactyl with ridge in gape, female chela without gape. Ambulatory legs elongate, setose; meri with 7-9 spinules on anterior margins; no more than 3 on posterior margins; carpi with single distal spinule; propodi long and unarmed, dactyls spinulous. Male carapace length 33.0 mm, width 30.0; female length 19.5 mm, width 17.1.
Color in life.--Tan mottled with dark brown to reddish, legs barred with reddish brown.
Habitat.--Almost always among rocks or rocky rubble, intertidal to 74 m.
Range.--Monterey Bay, California to Magdalena Bay, Baja California. Type locality "western America".
Remarks.--In its natural habitat, H. parvifrons slips into narrow spaces between and under rocks. The crab frequently is covered with small calcareous sponges.

Herbstia parvifrons

Genus Pelia Bell

Pelia tumida (Lockington)

Pisoides ? tumidus Lockington, 1877: 30.
Pelia tumida.--Holmes 1900: 35.--Rathbun 1904: 174.--Schmitt 1921: 211, pl. 34, figs. 5,6.--Rathbun 1925: 281, pl. 99, figs. 2,3.--Garth 1958: 271, pl. Q, fig. 1; pl. 31, fig. 2.--Garth and Abbott 1980: 601, fig. 25.12.—Hendrickx 1999: 150, fig. 86, pl. 6C.
Pelia clausa Rathbun, 1907: 72.--Schmitt 1921: 211, pl. 34, figs. 1-4.

Recognition characters.--Rostrum with shallow notch, rostral horns nearly parallel. Carapace pyriform, pubescent, without spines. Gastric region rounded and elevated, with small rounded tubercle; branchial regions inflated, cardiac region with rounded elevation. Anterolateral margin entire. Basal antennal segment longer than wide, with tooth at anteroexternal angle, flagella longer than rostrum. Chelipeds unarmed, hand inflated, male with fingers widely gaping, tubercle on margin of dactyl near base. Ambulatory legs flattened, pubescent, dactyls with sharp, cruved tips. Male carapace length 21.2 mm, width 14.5; female carapace length 20.5 mm, width 13.0.
Color in life.--Carapace buff, tan or orange, chelae white, mottled with brown, chela of adult male bright red; ambulatory legs with marks of orange and brown.
Habitat.--Rocks and reefs, intertidal to 129 m, but usually at 50 m or less.
Range.--Monterey Bay to Petatlan Bay, Mexico including Gulf of California. Type locality near San Diego.
Remarks.--Pelia tumida always has sponges attached to its dorsal surface. The crab attaches pieces to itself soon after molting. The sponge regenerates and grows to cover the entire dorsal surface of the crab. Many crabs are covered by yellow sponges, which at present are unidentified. The early confusion in the nomenclature of this species reflects the marked sexual dimorphism seen in adults. Immature males, like females, do not have as expanded chelae as mature males, nor is there a gape between the fingers.

Pelia tumida

Genus Chorilia Dana

Chorilia longipes Dana

Chorilia longipes Dana, 1851: 269.--Rathbun 1904: 174.--Schmitt 1921: 209, text-fig. 130.--Rathbun 1925: 203, pl. 224, figs. 1-3.--Garth 1958: 263, pl. P, figs 4,5; pl. 30.
Chorilia longipes turgida Rathbun, 1924: 3.—Garth 1958: 263.—Hendrickx 1999: 120, fig. 69, pl. 6A.

Recognition characters.--Rostrum almost half as long as remainder of carapace, horns tapering. Carapace covered by numerous tubercles and spines; largest spine at widest part of carapace at

margin of branchial region; 2 median gastric spines, ridge or tubercle on hepatic region. Slender preorbital spine. Basal antennal segment with 2 spines on outer margin, followed posteriorly by triangular tooth. Chelipeds massive; merus rough and with spines and tubercles; carpus also rough, hand compressed, upper edge thin, finger narrow, gaping in male; dactyl with subbasal tooth, distal ends of fingers meeting. First ambulatory legs about as long as chelipeds; other legs shorter; merus of each with short sharp point; dactyls slender and curved. Male carapace length 50.4 mm, wdith 30.2; female carapace length 54 mm, width 40.

Color in life.--White to dirty brown.

Habitat.--Among boulders, 33-1200 m, usually found at greater depths toward southern end of range.

Range.--Off Shumagin Bank, Alaska to Cortez Bank, California; northern Peru. Type locality "Oregon territory".

Remarks.--Two subspecies are recognized. Chorilia longipes Dana has a blunt ridge on the hepatic region; C. longipes turgida Rathbun has a spine on the hepatic region. Chorilia longipes occurs from Alaska to off Santa Catalina Island, California; C. longipes turgida has been found from Monterey Bay to off San Diego. The distribution of the typical form seems to be related to colder water temperatures, for the occurrence of this form toward the south is related to zones of upwelling.

Chorilia longipes

Genus Scyra Dana

Scyra acutifrons Dana

Scyra acutirons Dana, 1851: 269.--Holmes 1900: 41.--Rathbun 1904: 175.--Schmitt 1921: 214, text-figs. 134a, 134b.--Rathbun 1925: 195, pl. 79; pl. 224, figs. 4,5; text-fig. 79.--Garth 1958: 252, pl. P, fig. 1; pl. 27, fig. 1.--Carlton and Kuris 1975: 395.--Garth and Abbott 1980: 600, fig. 25.9.--Ricketts et al. 1985: 169.—Hendrickx 1999: 156, fig. 90, pl. 6D, E.

Recognition characters.--Rostrum flattened, short, horns shaped like feathers or arrow; rows of hooked setae on horns. Carapace pyriform; median region separated from cardiac and branchial regions by conspicuous depression; acute tubercle near center of median region and larger tubercle behind it. Branchial regions with felt-like setae and bearing large, projecting tubercle,; in front of this an elevated prominence usually bearing several small tubercles, large tubercle on cardiac region and smaller one on intestinal region. Considerable variation among individuals and between sexes in width of carapace and degree of prominence and elevation of tubercles and regions of carapace. Preorbital spine acute. Pterygostomian regions with several rounded teeth. Two spines on outer margin of basal antennal segment, lobe on its outer margin, flagellum long. Male cheliped considerably more robust than those of female, merus subcylindrical and somewhat flattened below, bearing pustules; carpus pustulate and having ridges on outer side; hand long, narrow, compressed, palm often with inflated ridge; fingers deflexed, in older male, gaping and with tooth near base of dactyl. Ambulatory legs subcylindrical, pubescent, propodi bearing groove on either side; dactyls short and rounded at apex. Male carapace length 46.5 mm, width 33.7; female carapace length 23.9 mm, width 15.9.
Color in life.--Dull tan to gray with marks of red on chelipeds and walking legs.
Habitat.--Rocks, reefs and pilings; intertidal to 114 m but usually less than 50 m.
Range.--Kachemak Bay, Cook Inlet, Alaska to Point San Carlos, Baja California. Type locality "Oregon".
Remarks.--Scyra acutifrons usually does not decorate, but instead is encrusted by sponges, barnacles, bryozoans or tunicates. Although many reports state that they rest with the anterior region aimed downward, there is no consistency in posture among crabs observed in subtidal areas. Considerable variation exists in shape of the carapace and its prominences within this species; likewise, maximum sizes of adults also vary. It is easy to confuse this species with similar subtidal spider crabs unless one studies the specimen carefully.

Scyra acutifrons

Genus Loxorhynchus Stimpson

Loxorhynchus grandis Stimpson

Loxorhynchus grandis Stimpson, 1857: 85.--Holmes 1900: 29.--Rathbun 1904: 175.--Schmitt 1921: text-figs. 132a, 132b.--Rathbun 1925: 198, pls. 64, 65, text-fig. 80.--Garth 1958: 257, pl. P, fig. 2; pl. 29.—Wicksten 1979b: 37.--
Garth and Abbott 1980: 600, fig. 25.10.—Hendrickx 1999: 141, pl. 5D.

Recognition characters.--Rostrum slightly longer than broad, much deflexed, horns convex above and below and separated for more than half their length, with rows of hooked setae except in mature adults. Carapace rounded, inflated, and covered with small, conical tubercles which may be worn in mature adults; junveiles with abundant hooked setae. Stout spine on maring of

hepatic region and another one just below margin. Preorbital spine large, often double pointed; postorbital spine subconical, acute. Basal antennal segment with anteroexternal spine and tubercle on outer margin; another on anterior margin at insertion of next segment. Chelipeds of adult male large, tuberculate; hand with palm inflated; female with shorter chelipeds, palm not inflated; chela slender and with narrow fingers in juveniles. Ambulatory legs subcylindrical, with few tubercles, propodi with grooves above, dactyls short and stout. Male carapace length 190 mm, width 145 mm; female carapace length 114 mm, width 86.

Color in life.--Brown, becoming bluish-gray to chalky white in aging adults; ventral surface white. (Stimpson's color notes as given by Garth, 1958, surely were of a dead or preserved animal).

Habitat.--Rocks, pilings, subtidal sand flats and sand dollar beds, lowest intertidal zone to 125 m.

Range.--Cordell Bank, California to Thurloe Head, Baja California. Type locality near San Francisco, California.

Remarks.--Juvenile L. grandis usually are almost impossible to detect in their natural habitat because they tend to remain inactive by day. Their bodies are covered by a dense coat of bryozoans, sponges, algae, hydroids, pieces of gorgonians or other materials. As the animals grow and mature, the hooked setae are lost or worn off. Mature males and females do not decorate at all. Adult L. grandis have been observed to congregate into mating "pods" in subtidal areas near the Redondo Submarine Canyon. Although most reports of these crabs describe them as "sluggish", they can move with surprising agility as long as they are submerged. Usually, they are found on the bottom, but individuals occasionally climb up among kelp or on pilings. Molts and dead individuals of L. grandis can be cast ashore in southern California. Live animals may be caught in traps. However, these crabs have a thick, hard exoskeleton that encases proportionally less meat than that of a Tanner crab, and therefore there is little market for these crabs for human food. Loxorhynchus grandis is the largest and heaviest crab found in California.

Loxorhynchus grandis

Loxorhynchus crispatus Stimpson

Loxorhynchus crispatus Stimpson, 1857: 453, pl. 22, figs. 2-4.--Holmes 1900: 30.--Rathbun 1904: 175.--Schmitt 1921: 213, text-figs. 133a, 133b.--Rathbun 1925: 200, pls. 66, 67.--Garth 1958: 260, pl. P, fig. 3, pl. 27, fig. 2; pl. 28, fig. 1.--Carlton and Kuris 1975: 395, pl. 97, fig. 58a, 58b, 58c.—Wicksten 1977b: 122.--Wicksten 1978: 217.--Wicksten 1979b: 37.Garth and Abbott 1980: 601, fig. 25.11.--Ricketts et al. 1985: 168, fig. 136.—Hendrickx 1999: 140, pl. 5C.

Recognition characters.--Rostrum with more divergent horns than in L. grandis, not as deflexed, separated for more than half length of rostrum, with rows of hooked setae. Carapace somewhat triangular, more rounded in females than males, with few large tubercles. Carapace with prominent tubercle on cardiac region connected by prominent ridge with tubercle on intestinal region; two tubercles on branchial regions, large tubercle and domelike prominence on hepatic region; tubercle on anterior and one on posterior portion of median region; tubercle on either side of anterior median tubercle; row of small blunt tubercles on each median region extending to each rostral horn; in most individuals, all tubercles, with surrounding pile, standing out as discrete masses. Carapace densely covered with pile and with patches of hooked setae in all but oldest mature males. Preorbital spine prominent, subconical. Cheliped of adult male longer than in female, chela much more massive. In both sexes, cheliped with 3-4 upper tubercles on merus; carpus with small tubercles; fingers of chela curved. Ambulatory legs rather short, with hooked setae; first pair shorter than chelipeds of adult male but longer in female, merus grooved above, dactyls of all legs short and stout. Male carapace length to 196 mm, width to 140; female 105 mm, width 68. (Largest male was exceptionally big for this species).

Color in life.--Light brown, with dark bands on legs of freshly-molted individuals, fingers of chelae white, with red marks in adult male.
Habitat.--Rocks, jetties, pilings, kelp beds, rocky reefs, worm tube beds; extreme low tide to 200 m.
Range.--Orford Reef, Oregon to Natividad Island, Baja California, but rarely found north of San Francisco, California. Type locality San Miguel Island, California.
Remarks.--The moss crab Loxorhynchus crispatus is the most heavily decorated crab of California or Oregon. Juveniles camouflage themselves with pieces of algae, bryozoans, sponges, ascidians, hydroids, or whatever is flexible and available (including such exotic materials as leaves from a redwood tree). The decorating behavior remains in adult females but is lost in mature males, which decorate the rostrum if any part at all. Large adults of both sexes also may bear barnacles, tunicates, tube worms and other organisms that settle on them in situ. Although reported to be "sluggish", L. crispatus can amble at a reasonable rate for a crab of its size, and can move up to 50 m or more during a single night. It is primarily nocturnal, and sometimes will climb up among kelp to feed.


male Loxorhynchus crispatus

juvenile Loxorhynchus crispatus

Family Parthenopidae

Members of the family Parthenopidae are commonly called elbow crabs, and with good reason. The elongated chelipeds, folded across the front, suggest the name. These sand-dwelling crabs, mostly tropical in distribution, are represented in California by only one species.

Parthenopid crabs have retractile eyes with small and well-defined orbits. The basal antennal segment is small and deeply imbedded between the inner angle of the orbit and the pits at the bases of the first antennae. The first antennae fold somewhat obliquely, not vertically. The distinctive chelipeds have fingers bent at an angle. The ambulatory legs are short, flattened and have broad segments.

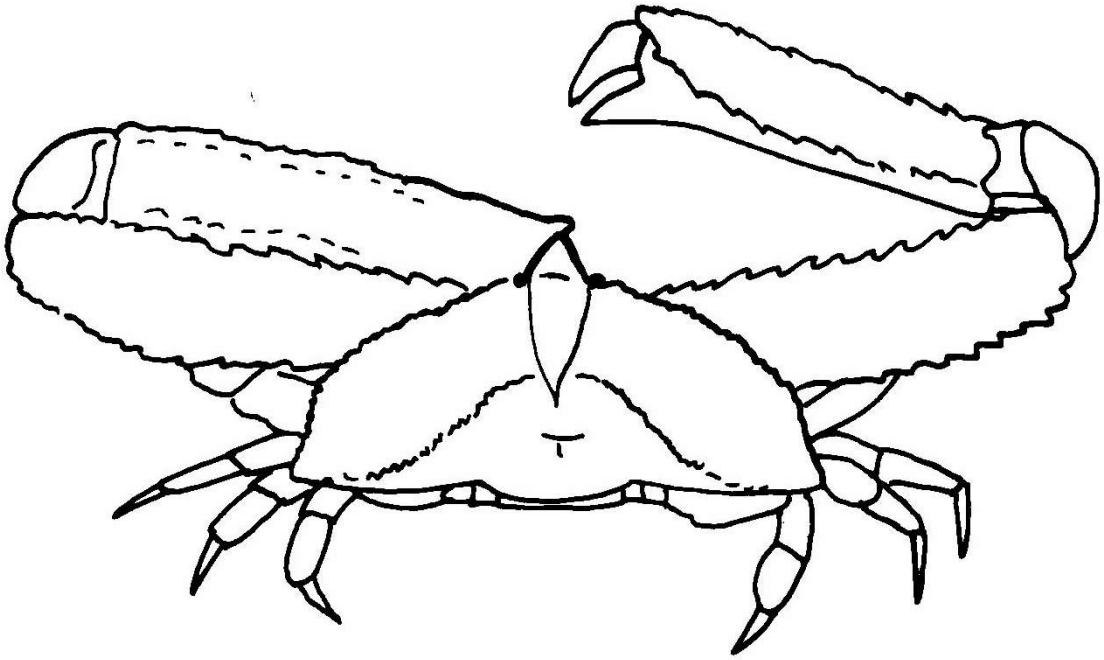
Elbow crabs can dig into sand and remain motionless with only the eyes, tip of the rostrum and a respiratory passage exposed. Their cryptic coloration renders them further difficult to detect.

Genus Heterocrypta Stimpson

Heterocrypta occidentalis (Dana)

Cryptopodia occidentalis Dana, 1854: 430.
Heterocrypta occidentalis.--Holmes 1900: 44.--Rathbun 1904: 170.--Schmitt 1921: 192, text-fig. 119.--Rathbun 1925: 559, pls. 204, 205.--Garth 1958: 476, pl Z, figs. 14, 14a; pl. 55, fig. 2.--Carlton and Kuris 1975: 393, pl. 96, fig. 47.--Ricketts et al. 1985: 321, fig. 246.—Hendrickx 1999: 251, pl. 8C.

Recognition characters.--Rostrum subtriangular, subacute, short. Carapace broadly triangular; median region narrow, flattened upper surface bounded by 2 granulated ridges, converging to triangular point posteriorly. Cardiac region with 3-sided elevation, edges usually granulated. Posterolateral regions large, with S-shaped, granulated crest, pair minute tubercles in front of anterior bend of crest. Anterolateral margins striaght to slightly concave in front, convex near middle, posterior portion extending outwards and backwards and arching over legs; teeth on anterior part small and irregular, but becoming larger posteriorly, there furnished with secondary denticles. Posterolateral margins transverse; posterior margin not produced over abdominal segments. Chelipeds long, triangular in cross-section; sides of merus convex, edge sharply granulate to toothed; carpus with 3-4 granulate lines; hand about as long as merus, angles prominent and dentate and sides convex; dactyl short but longer than fixed finger, when closed, outer margin at right angle to long axis of palm. Chelipeds folding against long triangular concave area of body, this area fringed by setae. Ambulatory legs compressed, strongly ridged above; dactyls narrow, curved. Male carapace length 21.0 mm, width 34.0; female carapace length 17.3 mm, width 26.8.
Color in life.--Grayish or brownish, sometimes with minute spots of white and purple; camouflaged like sand. Lower surface light yellow.
Habitat and depth.--Sand, sand mixed with shell, rock, or mud; intertidal to 175 m, but usually at less than 100 m.
Range.--Drake's Bay, Marin County, California to Dewey Channel, Baja California; also Gorda Bank, Gulf of California and Boca de Piedras, Sinaloa, Mexico. Type locality Monterey, California.



Heterocrypta occidentalis

Heterocrypta occidentalis

Family Cancridae

The rock crabs, among the largest species of crabs in California or Oregon, have broad, oval carapaces and strong chelae. The front has several teeth, including a median tooth. The antennules fold back longitudinally. The antennal flagella are short and bear setae, especially in small animals. The third maxillipeds overlap the endostome. In many species, the ventrolateral parts of the body bear dense setae.

Nations (1975) considered all of the local species of the Cancridae to belong to a single genus, Cancer, but divided them into four subgenera: Glebocarcinus, Romaleon, Metacarcinus and Cancer in the strict sense. Recent fossil and molecular evidence supports the elevation of these former subgenera into genera in their own right. See Harrison and Crespi, 1999 and Schweitzer and Feldmann, 2000 (http://dpc.uba.nl/ctz/vol69/nr04/art02) for extensive discussions of the phylogeny, distribution and classification by both molecular and morphological means for these crabs.

Species of the Cancridae inhabit both rocky and sandy bottoms, or areas of rocks lying among sand. Metacarcinus magister and M. gracilis, which usually live on open sand, have especially flattened appendages with long dactyls. Other species tend to have more rounded appendages with shorter dactyls, which often bear stiff setae or spines. Juveniles and megalops larvae of Romaleon jordani cling to the medusae of large jellyfishes.

Many species of the Cancridae are large and edible, so it is not surprising that they were among the first crabs to receive a scientific name. The generic name "Cancer" indeed means "crab"; the dreaded disease is named from a fanciful resemblance of the spreading malignant cells to the engulfing pincers of a crab. The most comprehensive recent work on the Cancridae is that of Nations (1975), from which the following key is largely derived. Larger common species can be identified with the popular guide by Phillips (1973), bearing in mind that the generic names have been changed.

Key to the Species of the Family Cancridae

1. Carapace rounded, with sharply differentiated, elevated regions set with coarse and rounded granules. (Small adult size)---------- 2

Carapace more or less oval in shape, regions not as sharply elevated, not set with coarse and rounded granules. (Adults small to large)----------3

2. Carapace widest at seventh or eighth tooth, with 12-13 anterolateral teeth. (Rarely found south of Point Arena, California)----------Glebocarcinus oregonensis (Rathbun)

Carapace widest at ninth tooth, with 9 anterolateral teeth. (In eastern Pacific, from El Segundo, California to Magdalena Bay, Mexico)----------Glebocarcinus amphioetus (Rathbun)

3. Carapace widest at tenth anterolateral tooth; no eleventh tooth. Fingers of chelipeds with pale color. (Ambulatory legs flattened)----------Metacarcinus magister (Dana)

Carapace widest at ninth anterolateral tooth; with tenth and sometimes eleventh tooth. Fingers of chelipeds pale or dark. (Ambulatory legs usually not flattened)----------4

4. Anterolateral teeth low, not spiny-pointed. Fingers of chelae without dark color. Merus of third maxillipeds rounded anteriorly----------Metacarcinus gracilis (Dana)

Anterolateral teeth projecting more than 0.3X length of base, often spiny-pointed. Fingers of chelae with dark color. Merus of third maxillipeds truncated anteriorly----------5

5. Front not produced, anterolateral teeth not separated to bases. Chela with orange blotch on inner surface of palm----------Metacarcinus anthonyi (Rathbun)

Front strongly to moderately produced, anterolateral teeth separated to bases. Chela without orange blotch on inner surface of palm----------6

6. Front markedly produced, projecting beyond outer orbital angles, with 5 subequal teeth. (Palm of chela roughened above)----------Cancer productus Randall

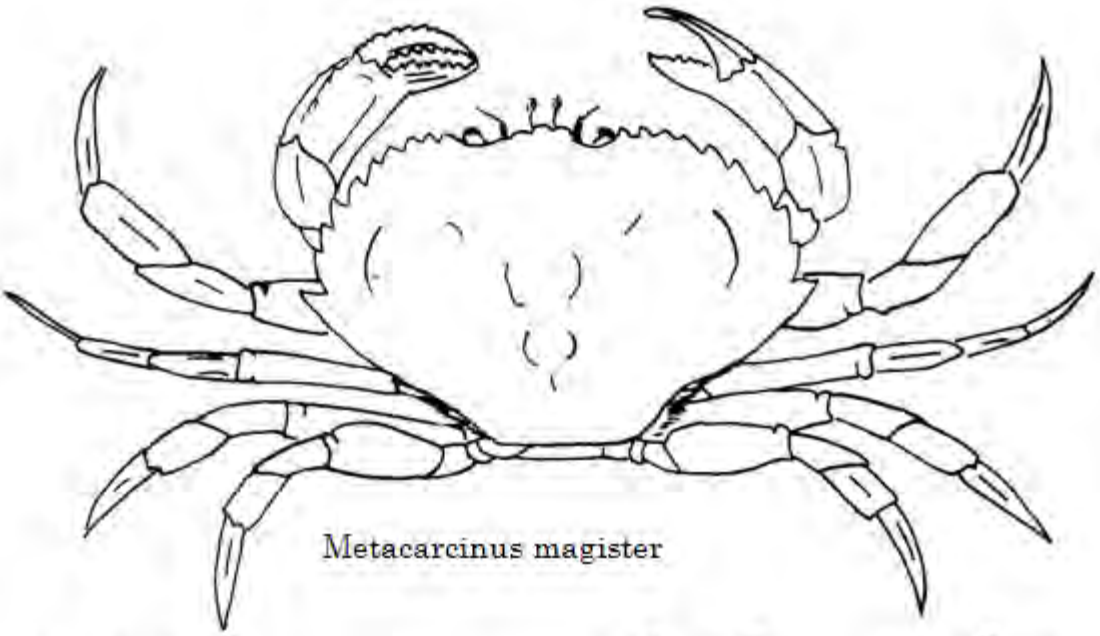
Front not markedly produced, not projecting beyond outer orbital angles, with 5 unequal teeth. (Palm of chela smooth or roughened above)----------7

7. Carpus of cheliped with single spine above distal end; hand without spines. Lower surface of body spotted or blotched with red----------Romaleon antennarius (Stimpson)

Carpus of cheliped with 2 spines above distal end; hand with 2 or more spines (which may be inconspicuous). Lower surface of body not spotted or blotched with red----------8

8. Carapace with prominent raised areas, tenth anterolateral tooth conspicuous. Dactyl of cheliped with spines----------Romaleon branneri (Rathbun)

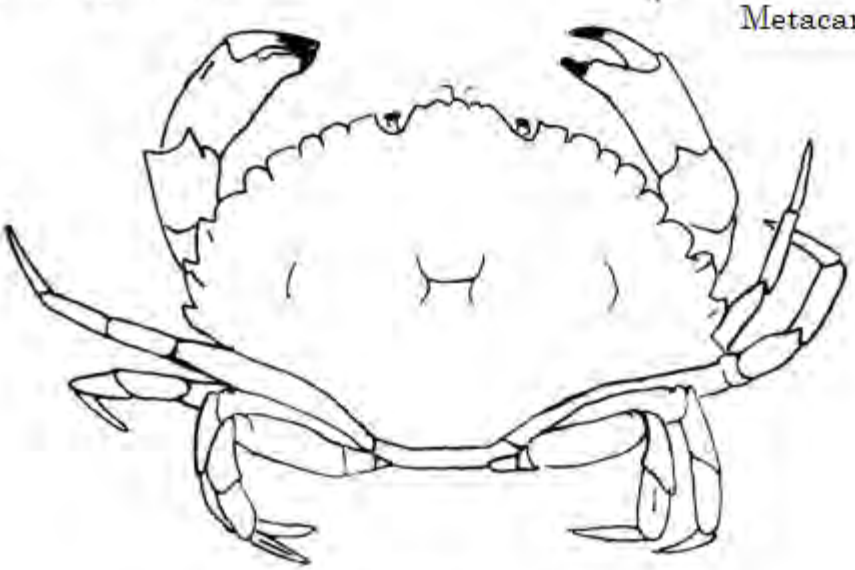
Carapace with slightly raised areas, tenth anterolateral tooth inconspicuous. Dactyl of cheliped without spines----------Romaleon jordani (Rathbun)



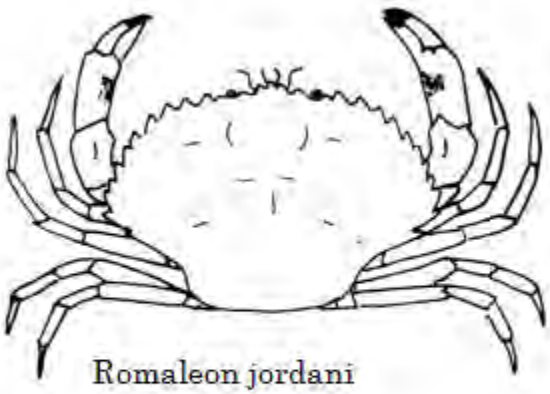
Metacarcinus magister

Glebocarcinus
oregonensis

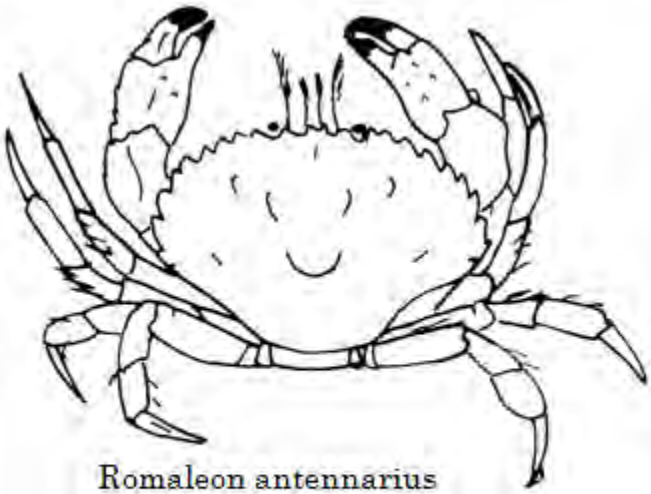
Metacarcinus gracilis



Cancer productus

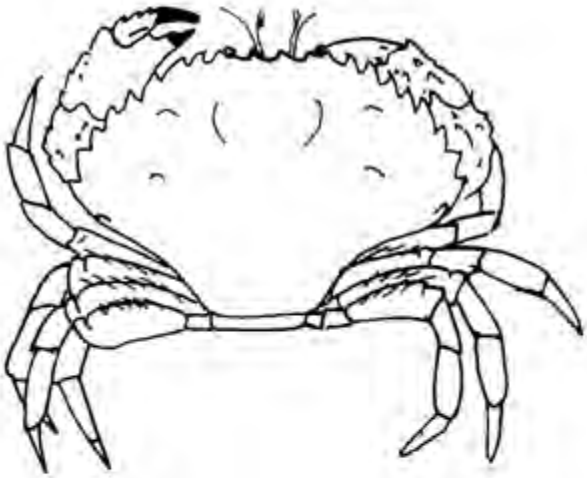


Romaleon jordani



Romaleon antennarius

Romaleon branneri



Metacarcinus anthonyi

Glebocarcinus amphioetus

Genus Glebocarcinus Nations

Glebocarcinus oregonensis (Dana)

Trichocera oregonensis Dana, 1852: 86.
Cancer oregonensis .--Rathbun 1904: 178, pl. 7, fig. 1.--Schmitt 1921: 234, pl. 36, figs. 3-4.--Rathbun 1930: 226, pl. 96.--Carlton and Kuris 1975: 396.--Nations 1975: 38, figs. 17E, 17F, 18E, 18F, 30-1, 30-2.—Wicksten 1979d: 1181.--Garth and Abbott 1980: 607, fig. 25.21.--Ricketts et al. 1985: 305, fig. 237.
Glebocarcinus oregonensis. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Carapace rounded, anterolateral and posterolateral margins not meeting at distinct angle; widest at seventh or eighth tooth; 12-13 anterolateral teeth. Ornamentation of dorsal surface of carapace variable; from moderately raised areas to pronounced tuberculate patches. Merus of third maxilliped with antero-external angle produced. Carpus of chelipeds with spine at antero-internal angle with tooth below it; hand thick and high, upper edge of palm with 2 rows small tubercles; outer surface with 5 granulated lines. Carapace length to 36.5 mm.
Color in life.--Usually dark red-brown above, lighter below; walking legs may have bands of light color. Some individuals may have red spots or bands of orange or yellow on carapace, others may have gray carapace. Chelipeds with dark tips.
Habitat.--Intertidal to 435 m, among rocks, tidepools, in barnacle shells, among mussels on pilings.
Range.--St. George Island, Pribilofs to off Palos Verdes Peninsula, California, but rarely found south of Point Arena, Mendocino County, California. Type locality "Puget Sound".

Glebocarcinus amphioetus (Rathbun)

Cancer amphioetus Rathbun, 1898: 582.--Rathbun 1904: 175, pl. 6, fig. 3.--Schmitt 1921: 223, pl. 36, figs. 1, 2.--Rathbun 1930: 205, pl. 91.--Nations 1975: 30, figs. 15A, 15B, 16A, 16B, 30-7-, 30-8.--Garth and Abbott 1980: 604.
Glebocarcinus amphioetus. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Carapace smooth and strongly areolated (with prominent raised areas), front with 5 median teeth, median tooth small; anterolateral margins with 9 flat, broadly triangular teeth, tiny tenth tooth. Third maxilliped with merus truncated anteriorly. Body not setose. Carpus of cheliped with 2 spines, one at distal end and second below it on inner angle; hand of cheliped with 1-2 spines on upper margin and 3 longitudinal ridges on outer surface. Ambulatory legs stout. Male carapace length 22.2 mm, female 27.5.
Color in life.--Reddish brown, lighter beneath; fingers of chelae dark, with color reaching more than 0.5x length of outer margin.
Habitat.--Intertidal to 148 m, usually subtidal; on rocks, sand, shells and mud.
Range.--El Segundo, California to Magdalena Bay, Baja California; Gulf of California, Japan, Korea and northern China. Type locality "off the Korean coast".

Genus Cancer Linnaeus

Cancer productus Randall

Cancer productus Randall, 1839: 116.--Rathbun 1904: 175.--Schmitt 1921: 220, text-fig. 136.--Rathbun 1903: 203, text-fig. 32.-- Carlton and Kuris 1975: 396, pl. 97, fig. 57.-- Nations 1975: 40, figs. 13A, 13B, 14A, 14B, 39-1, 39-2.--Garth and Abbott 1980: 607, fig. 25.22.--Ricketts et al. 1985: 134, fig. 105.

Recognition characters.--Front markedly produced beyond outer orbital angles, with 5 subequal teeth, fronto-orbital width about 0.2X width of carapace. Carapace very broad, widest at ninth anterolateral tooth, tenth tooth present. Surface of carapace somewhat convex and smooth to minutely granulate. Carpus of chelipeds with large tooth at antero-internal angle and smaller one at upper hinge joint, palm with ridge along dorsal surface and granulate ridges on palm. Carapace length of female 66.4 mm.
Color in life.--Juveniles highly variable: carapace red, orange, striped with white and red, mottled, gray or gray with median stripe of red; legs striped or red. (See color photographs given by Garth and Abbott, 1980). Adult dark red above, white to yellowish below. Chelae with dark tips.
Habitat.--Tidepools, rocks in sand, rocky reefs, breakwaters; intertidal to 79 m.
Range.--Kodiak Island, Alaska to San Diego, California. Older reports from Magdalena Bay, Baja California are unconfirmed. Type locality "western America".
Remarks.--The red rock crab can have a carapace width of up to 173. 5 mm. The exoskeleton is well calcififed. The crab is one of the largest intertidal crabs in California and Oregon, as well as one of the heaviest. It is edible but not sufficiently common to support a commercial fishery.


Cancer productus


juvenile Cancer productus

Genus Metacarcinus Milne-Edwards

Metacarcinus magister (Dana)

Cancer magister Dana, 1852: 73.--Rathbun 1904: 177.--Schmitt 1921: 229, text-fig. 138.--Rathbun 1930: 222, text-figs. 35, 36.--Carlton and Kuris 1975: 396, fig. 2.--Nations 1975: 37, figs. 17A, 17B, 18A, 18B, 23, 34-1, 34-2.--Garth and Abbott 1980: 605, Fig. 25.20.--Ricketts et al. 1985: 199, fig. 170.
Metacarcinus magister.--Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Front of carapace not produced, with 3 small median teeth. Carapace widest at tenth anterolateral tooth, no eleventh tooth; anterolateral teeth serrate anteriorly. Carapace wide, granulate. Carpus of chelipeds with single distal spine, palm with dorsal serrate ridge having conspicuous teeth and ridges on sides; movable finger with dorsal teeth and lateral ridges. Merus of third maxilliped widened distally, its anterior margin forming obtuse angle with outer margin. Ambulatory legs broad and flat. Carapace length 120.7 mm.
Color in life.--Carapace reddish brown to gray, lower surface and appendages creamy white to yellowish. Fingers of chelipeds light-colored.
Habitat.--Bays, harbors, sandy beaches, eelgrass flats, sandy areas of continental shelf, low

intertidal to 230 m.
Range.--Tanaga Island, Aleutians to Pismo Beach, California. Old records from Santa Barbara, California and Magdalena Bay, Baja California are unconfirmed. Type locality San Francisco Bay.
Remarks.--The Dungeness crab is the most important commercial crab of the Pacific coast of the United States. Adult crabs usually are trapped off shore, but juveniles often can be found in bays and harbors at low tide. Very small juveniles and megalops larvae sometimes ride on jellyfishes and the by-the-wind sailor Velella .


Metacarcinus magister

Metacarcinus gracilis (Dana)

Cancer gracilis Dana, 1852: 73.--Rathbun 1904: 177.--Schmitt 1921: 232, pl. 35, fig. 2.--Rathbun 1903: 219, pl. 95, text-fig. 34.--Carlton and Kuris 1975: 396.--Nations 1975: 34, figs. 17C, 17D, 18C, 18D, 36-1, 36-2.--Garth and Abbott 1980: 604, fig. 25.18.--Ricketts et al. 1985: 543. Metacarcinus gracilis. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Carapace strongly convex, front not produced, with 3 median teeth. Anterolateral teeth of carapace low and not pointed, carapace granulated and widest at ninth tooth; small tenth anterolateral tooth present. Merus of third maxillipeds elongated, rounded anteriorly. Carpus of chelipeds with 2 spines, one above at distal angle and second below it. Palm with rows of minute spinules, movable finger roughened dorsally but without large teeth. Ambulatory legs slender, dactyls elongated. Carapace length 27.3 mm.
Color in life.--Carapace brownish to gray, lower surface and much of legs yellowish, purple

marks on anterior ambulatory legs. Tips of chelipeds white.
Habitat.--Mud flats, sandy beaches, eel grass beds, sandy coasts; intertidal to 174 m.
Range.--Prince William Sound, Alaska to Playa Maria Bay, Baja California, Mexico. Type locality San Francisco, California.
Remarks.--Megalops larvae and juveniles of this crab have been found on large jellyfishes.


Metacarcinus gracilis

Metacarcinus anthonyi (Rathbun)

Cancer anthonyi Rathbun, 1897: 111.--Rathbun 1904: 176, pl. 6, fig. 2.--Schmitt 1921: 227, pl. 35, fig. 1.--Rathbun 1930: 218, pl. 94, fig. 3.--Carlton and Kuris 1975: 396.--Nations 1975: 32, figs. 13E, 13F, 14E, 14F, 35-5, 35-6.--Garth and Abbott 1980: 604, fig. 25.17.
Metacarcinus anthonyi. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Front narrow, not produced, with 3 teeth. Carapace granulate, convex, widest at ninth anterolateral tooth; anterolateral teeth broad, last 3 teeth with sharp tips; tenth anterolateral tooth indistinct. Merus of third maxillipeds oblong, anterior margins slightly oblique. Carpus of chelipeds with single distal spine; hand smooth or granulated, without spines. Ambulatory legs sparsely setose to smooth. Male carapace length 52.1 mm.
Color in life.--Brownish-red to yellowish-orange, lighter beneath and without spots; a blotch of orange on inner surface of palm of chela; fingers of chela black. Juveniles may have a mottled carapace with markings of white, brown and tan.
Habitat.--Among rocks in bays and estuaries, intertidal to 132 m.
Range.--Humboldt Bay, California to Magdalena Bay, Baja California, but uncommon north of Los Angeles County, California. Type locality Long Beach, California.
Remarks.--The yellow crab is another large, heavily calcified intertidal crab. It seems to prefer slightly warmer waters than C. productus and Romaleon antennarius, the other similar large

crabs that live in rocky habitats. Records north of San Pedro usually come from bays and harbors rather than the open coast.

Metacarcinus anthonyi

Genus Romaleon Gistl

Romaleon antennarius (Stimpson)

Cancer antennarius Stimpson, 1856: 96.--Rathbun 1904: 176.--Schmitt 1921: 224, pl. 35, fig. 3; pl. 36, fig. 8; text-fig. 137.--Rathbun 1930: 210, pl. 92, pl. 93, fig. 2; text-fig. 33.--Carlton and Kuris 1975: 396, pl. 97, fig. 61.--Nations 1975: 31, figs. 13C, 13D, 14C. 14D, 32-5, 32-6.--Garth and Abbott 1980: 602, fig. 25.16.--Ricketts et al. 1985: 133, fig. 104.—Breen and Wicksten 1990: 10.
Romaleon antennarius. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Carapace smooth, with front not produced and with 3 median teeth. Carapace widest at eighth anterolateral tooth, 11 anterolateral teeth present. Merus of third maxillipeds with distal margin nearly transverse, angles rounded. Chelipeds may be slightly unequal in size. Carpus of chelipeds with single spine above, carpus and palm bearing faint ridges, movable finger smooth. Ambulatory legs sturdy, usually setose. Juveniles may be more setose than adults. Male carapace length 61.7 mm, female to 54.1 mm.
Color in life.--Dark reddish above, yellowish with red spots below. Fingers of chelae dark.
Habitat.--Under rocks set in sand, tidepools, among sea grasses, breakwaters and rocky reefs, intertidal to 40 m.
Range.--Coos Bay, Oregon to Todos Santos Islands, Baja California. Reports from British Columbia are unconfirmed. Type locality San Francisco Bay.
Remarks.--The rock crab is one of the most common larger crabs in California and Oregon. It is taken by sport fishermen as well as predatory fishes, octopuses and sea otters.

Romaleon antennarius

Romaleon branneri (Rathbun)

Cancer branneri Rathbun, 1926: 63.--Rathbun 1930 211, pl. 93, fig. 1.--Nations 1975: 33, figs. 15E, 15F, 16E, 16F, 31-1, 31-2.--Garth and Abbott 1980: 605.
Cancer gibbosulus.--Schmitt 1921, pl. 36, fig. 7.--Carlton and Kuris 1975: 406. Not Cancer gibbosulus (De Hann, 1835) = Asiatic species. See Rathbun, 1930, for full synonymy.
Romaleon branneri. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Carapace markedly areolated, sparsely setose with coarse setae. Front with 5 acute teeth, anterolateral margin with 9 forward-curving teeth, all but first 2 teeth tipped with spines; tenth and eleventh teeth present. Merus of third maxillipeds abruptly truncated. Chelipeds hairy, carpus with 2 spines, one above at distal end and second below it at inner angle; upper surface of hand with 2 rows of 3-5 spines; outer surface of hand with 5 ridges marked with setae and small spines; upper margin of movable finger spinose. Ambulatory legs setose; dactyls somewhat long and striaght, tipped with spines. Male carapace length to 35.5 mm.
Color in life.--Variable: whitish with irregular reddish blotches, ambulatory legs light banded with red to dark reddish brown. Fingers of chelae dark.
Habitat.--Intertidal to 80 m, on sandy mud, coarse sand or shells.
Range.--Port Althorp, Alaska to Cedros Island, Baja California, Mexico. Type locality San Francisco, California.

Remarks.--This small crab has been collected in abundance at Redondo Beach, California and may be common elsewhere.

Romaleon jordani (Rathbun)

Cancer jordani Rathbun, 1900: 133.--Rathbun 1904: 176, pl. 6, fig. 4.--Schmitt 1921: 228, pl. 36, figs. 5-6.--Rathbun 1903: 215, pl. 94, figs. 1-2.--Carlton and Kuris 1975: 396.--Nations 1975: 36, fig. 15C, 15D, 16C, 16D, 31-3, 31-4.--Garth and Abbott 1980: 605, fig. 25.19.
Romaleon jordani. --Schweitzer and Feldmann 2000: http://dpc.uba.uva.nl/ctz/vol69/nr04/art02 .

Recognition characters.--Carapace slightly areolated, setose. Front with 5 teeth, almost hidden by setae, median tooth very small; anterolateral carapace margin with 9 prominent teeth, often laternating in size; tenth tooth present in older specimens. Merus of third maxilliped obliquely truncated. Carpus of cheliped with 2 spines, palm of cheliped with 2 superior and 5 external ridges, fringed with setae, several spines on upper ridges, movable finger without spines. Male carapace length 25.4 mm, female 15.5.
Color in life.--Mottled with light brown and tan, lower surface yellowish, setae brownish to golden, fingers of chelae dark.
Habitat.--Lowest intertidal zone to 104 m; on sand or among kelp holdfasts. Juveniles often associate with large medusae.
Range.--Coos Bay, Oregon to Cape Thurloe, Baja California. Type locality Monterey Bay, California.

Family Portunidae

The swimming crabs are most abundant in warm temperate to tropical seas. Three species may be found in southern California, but only one of these is common. The Atlantic green crab Carcinus maenas has been introduced into bays.

Swimming crabs usually have a carapace that is wider than long. There is no rostrum. The carapace bears lateral teeth, the posterior of which may be considerably larger than the anterior teeth. The orbit is complete. The first antennae fold obliquely or transversely. The chelae are toothed; the cheliped bears spines.

As the common name suggests, most swimming crabs can swim strongly by means of paddle-like dactyls of the fifth pereopods. Common nearshore species can dig rapidly into sand.

Except for Carcinus maenas, species of the Portunidae of the eastern Pacific have been discussed in detail in the work by Garth and Stephenson (1966). The descriptions and key given here are in large part derived from the 1966 work, which the reader should consult for further information on anatomy, ranges and classification.

Key to the Species of the Family Portunidae

1. Eyestalks extremely long, one third or more of carapace breadth-------Euphylax dovii Stimpson

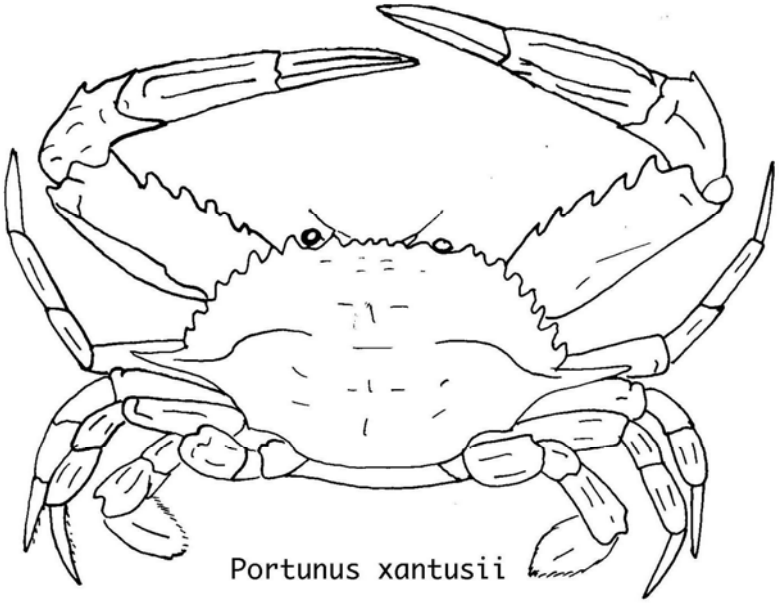
Eyestalks not as long, much less than one third of carapace breadth----------2

2. Carapace narrow, 5 anterolateral teeth; fifth legs without flattened swimming paddles----------Carcinus maenas (Linnaeus)

Carapace broad, 9 anterolateral teeth, fifth legs with flattened swimming paddles----------3

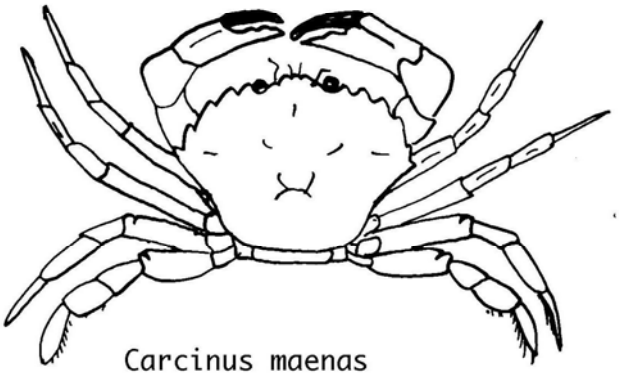
3. Male abdomen triangular; anteroexternal angle of merus of third maxilliped not strongly produced laterally----------Portunus xantusii xantusii (Stimpson)

Male abdomen shaped like inverted T; anterolateral angle of merus of third maxilliped strongly produced laterally----------Callinectes arcuatus Ordway

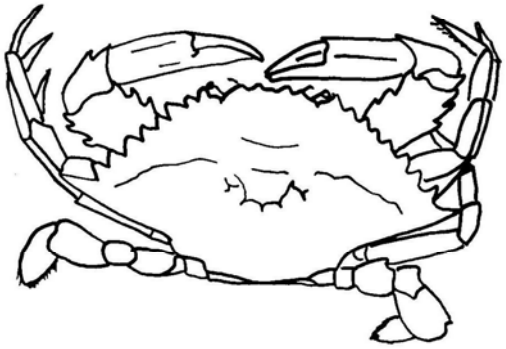


Portunus xantusii

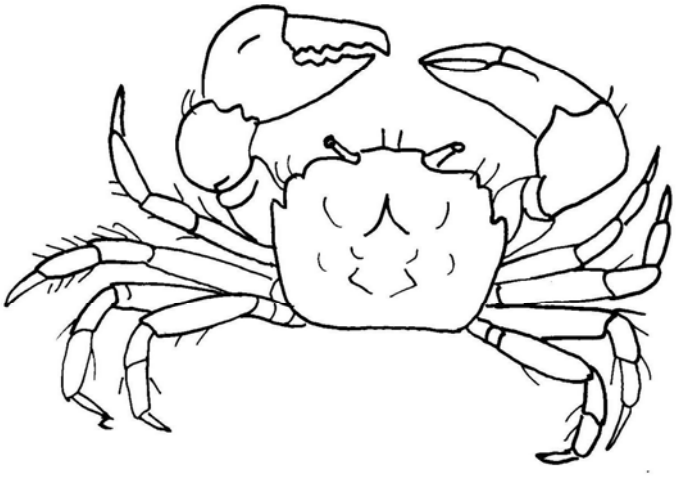
Euphylax dovii



Carcinus maenas



Callinectes arcuatus



Malacoplax californiensis

Genus Euphylax Stimpson

Euphylax dovii Stimpson

Euphylax dovii Stimpson, 1860: 226, pl. 5, figs. 5, 5a.--Rathbun 1930: 147, pl. 65.--Garth and Stephenson 1966: 64, pl. VI, figs. A,B; pl. VIII, fig. F, pl.X, figs. F, G; pl. XII, fig. G, text-figs. 3a.--Word. 1976: 161, fig. 1.--Chivers 1979: 276.

Recognition characters.--Carapace relatively long, roughly ovoid; widest near middle, cardiac and branchial regions swollen. Front narrow, T-shaped, with median notch. Orbital region broad, length of eyestalk over 0.66X carapace breadth. Four-five anterolateral teeth or lobes; first most stout, last most protruding. Third maxilliped with anteroexternal angle laterally produced. Chelipeds long, hands compressed. Fingers with well spaced large teeth, movable finger with dorsal carina. Walking legs elongate; merus of fifth leg with subterminal spine on posterior margin; dactyls broad and flat, fifth leg with swimming paddle. Male carapace length to 52.8 mm, female to 25.9.
Color in life.--Carapace and merus of all legs deep purple, rest of appendages wine red; undersides blue, sternum white, abdomen brownish.
Habitat and depth.--Intertidal to 65 m but often taken well offshore; capable of swimming long distances.
Range.--Monterey Bay, California to Gulf of Guayaquil, Peru. Type locality "western coast of Central America". The species rarely occurs in California.

Genus Carcinus Leach

Carcinus maenas (Linnaeus)

Cancer maenas Linnaeus, 1758: 627.
Carcinides maenas.--Rathbun 1930: 15, fig. 4.
Carcinus maenas.--Williams 1984: 356, fig. 289.-- Ricketts et al. 1985: 296, fig. 231.

Recognition characters.--Carapace aboout 0.75X long as broad. Front with 3 broad teeth, anterolateral margin with 5 strong teeth. Third maxilliped with anteroexternal angle not produced. Chelipeds slightly unequal, nearly smooth except for 2 ridges on upper surface of hand; merus short, carpus with broad internal tooth or angle. Walking legs smooth and unarmed, dactyl of fifth leg lance-shaped, not forming swimming paddle. Male and female carapace length to 60 mm.
Color in life.--Variable. Carapace dark green, bluish to reddish, sometimes China white; legs varying to yellowish white to tile white or violet; juveniles often more colorful and polymorphic in pigmentation than adults.
Habitat.--Intertidal to 200m, but usually shallow; bays, tidepools; among rocks, oysters, gravel or shells. Tolerant of low salinities.
Range.--Northumberland Strait to Virginia in North America; Kvaenangen, Norway, Baltic Sea and North Sea to Mauritania. Introduced into San Francisco Bay, California and Willapa Bay, Washington; also Australia, Burma, Red Sea, Madagascar, India and Ceylon. Type locality Marstrand north of Goteborg, west coast of Sweden.
Remarks.--Hardy and a prolific breeder, the green crab easily can be spread by human activity.

It is a predator on clams and oysters, and thus is considered a pest by fishermen.

Genus Portunus Weber

Portunus xantusii xantusii Stimpson

Achelous xantusii Stimpson, 1860: 222.
Portunus xantusii.--Holmes 1900: 71.--Schmitt 1921: 237, text-fig. 141.--Ricketts et al. 1985: 322, fig. 248.
Portunus xantusii xantusii.--Garth and Stephenson 1966: 32, pl. IV, fig. A; pl. VII, fig. B; pl. IX, fig. B, pl. XI, fig. B.--Garth and Abbott 1980: 602, fig. 25.14.

Recognition characters.--Carapace borad, pilose, posterolateral corner rounded. Front advanced, with 4 lobes. Orbital region with inner supraorbital angle partially subdivided; supraorbital fissures opne to closed. Supraorbital tooth acute to blunt, suborbital fissure open. First anterolateral tooth blunt, fifth tooth stouter than fourth or sixth; ninth tooth very long. Third maxilliped with anteroexternal angle of merus not produced laterally. Chelipeds moderately long, robust; with 4-6 spines on anterior border. Wrist with inner and outer spines moderately well developed, fingers short and stout. Fifth leg with posterodistal border of merus with spinules. Male carapace length to 70.7 mm, female to 55.9.
Color in life.--Speckled with gray, black and white; tips of legs pinkish, walking legs with white and brown bands; camouflaged like sand.
Habitat.--Usually on sand, intertidal to 181 m, but usually shallow; capable of swimming to surface.
Range.--South of Santa Cruz Island and SE of Santa Barbara Point, California to Marquis Point, Baja California; and from San Ignacio Bay to near Punta Piaxtla, Sinaloa, Mexico. Type locality Cape San Lucas. Other subspecies range into the Gulf of California and south to Colombia.

Portunus xantusii xantusii

mating Portunus xantusii xantusii

Genus Callinectes Stimpson

Callinectes arcuatus Ordway

Callinectes arcuatus Ordway, 1863: 578.--Rathbun 1930: 121, pl. 52, text-figs. 15h, 16h, 17f, 18g.--Garth and Stephenson 1966: 43, pl. V, fig. A; pl. VIII, fig. A; pl. X, fig. A; pl. XII, fig. D.--Garth and Abbott 1980: 603, fig. 25.15.

Recognition characters.--Carapace with surface moderately finely granulate, regions well marked. Front with 4 triangular teeth, orbital region with inner supraorbital lobes square-cut, inner supraorbital fissure closed, suborbital tooth prominent. Anterolateral teeth stout, first 4 blunt; fifth to seventh sharp, eighth tooth very sharp, ninth moderately long. Chelipeds with carinae of hand granular. Fifth leg with swimming paddle. Male carapace length to 51.3 mm, female to 43.3.
Color in life.--Carapace olive gray-green, chelipeds olive green dorsally, whitish ventrally, tips yellow-brown; legs turquoise with olive stain, setae golden; fifth legs olive green with turquoise tints, paddles with black stain. Juveniles may be more variable in color and camouflaged like sand or shell.
Habitat.--Bays and estuaries, sand, mud or shell bottoms, shore to 28 m.
Range.--Los Angeles Harbor, California to off Puerto Pizarro, Peru. Type locality Cape San Lucs.

Remarks.--In California, scattered populations have been reported at Anaheim Slough and in San Diego County. This large and edible crab probably has suffered from loss of habitat in southern California.

Family Xanthidae

The family Xanthidae, primarily tropical and subtropical in distribution, contains the greatest diversity of genera and species of any brachyuran group. Williams (1984) summarized some of the major controversies regarding classification of these crabs. Guinot (1971, 1978) divided the family into new families and subfamilies; however, characters used to define genera in these families at times overlap with those of crabs considered to belong to separate families. There has been no recent comprehensive systematic work on the xanthid crabs of the eastern Pacific. In this work, members of the family Goneplacidae are treated as a separate family. The key presented here is artificial. The key to the species of Lophopanopeus is modified from that of Menzies (1948). Subspecies are treated in the sections on the species.

Xanthids commonly are called mud crabs, an appropriate name for the species that inhabit bays along the Atlantic coast and Gulf of Mexico in the U.S.A. However, the native species of the Pacific coast live among rocks, reefs and shells.

Like species of the family Cancridae, xanthids can be common in intertidal areas, especially in southern California. Among xanthids, the antennules fold obliquely or transversely, not lengthwise. The flagellum of the antenna is smooth, not hairy. The anterolateral teeth of the carapace often are fewer in number or are more blunt than those of cancrids. The chelipeds may differ greatly in size; the fingers may bear a large crushing tooth. Only one xanthid crab grows to the size of an edible cancrid. Xanthids rarely inhabit sandy shores or sandy areas of the continental shelf, and do not have flattened appendages, as in some common cancrids.

Heteractaea lunata (Milne-Edwards and Lucas, 1847) was reported by Schmitt (1921) as occurring in San Diego, California. However, Garth (1957) noted that this is primarily a species of the tropical eastern Pacific, and is associated with corals of the genus Pocillopora. These corals do not live in California. It seems likely that the record from San Diego is an error or due to a crab thrown overboard from a fishing boat.

Key to the Species of the Family Xanthidae

1. Carapace and chelipeds with prominent rounded tubercles-----Paraxanthias taylori (Stimpson)

   Carapace and chelipeds without prominent rounded tubercles----------2

2. Fronto-orbital border less than half of greatest width of carapace. Anterolateral margin of carapace with 8-10 teeth----------Cycloxanthops novemdentatus (Lockington)

   Fronto-orbital border half or more of greatest width of carapace. Anterolateral margin of carapace with 3-5 teeth----------3

3. Carapace transversely oval; front divided by open, rounded notch. (San Diego to Cape San Lucas) ---------- Micropanope latimana Stimpson

   Carapace hexagonal to subquadrate; front divided by slight notch to more or less closed fissure. (Alaska-Baja California)----------4

4. Fingers of chelae with white tips or white throughout their length. Carpal joints of walking legs not bilobed----------5

Fingers of chelae with black or brown tips. Carpal joints of walking legs slightly to strongly bilobed----------6

5. Dactyl of major chela strongly curved. Fingers of chelae light-colored throughout their length. (Introduced into bays)----------Rhithropanopeus harrisii (Gould)

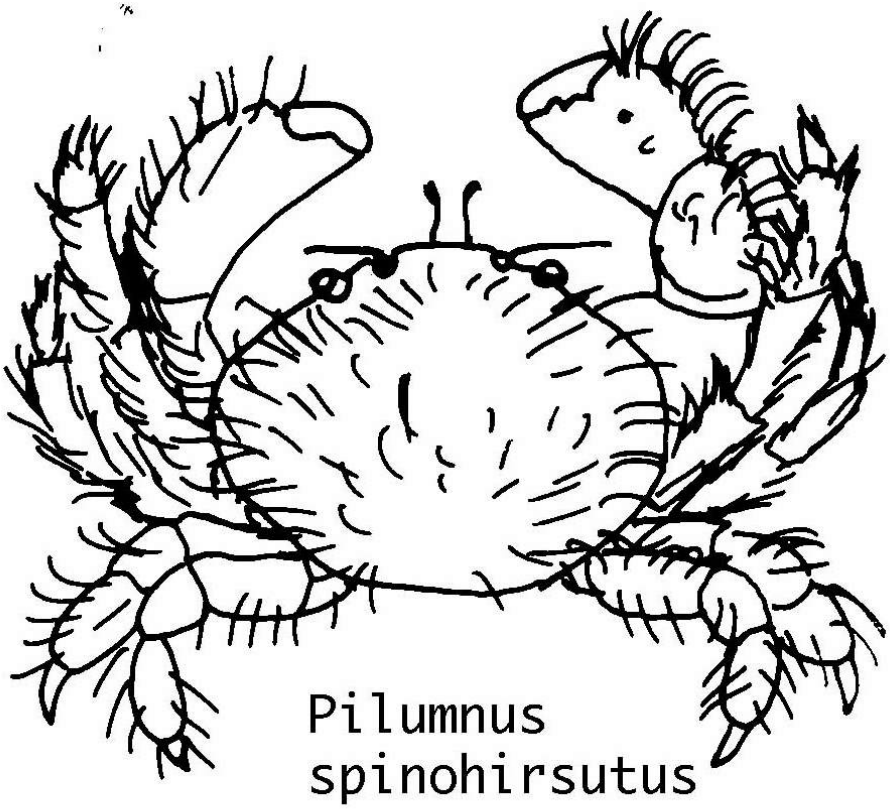
Dactyl of major chela angled downward. Fingers of chelae with proximal dark blotches. (Subtidal off Anacapa island, California)----------Eurypanopeus hyperconvexus Garth

6. No enlarged tooth present at proximal end of cutting edge of dactyl of major cheliped----------Lophopanopeus frontalis (Rathbun)

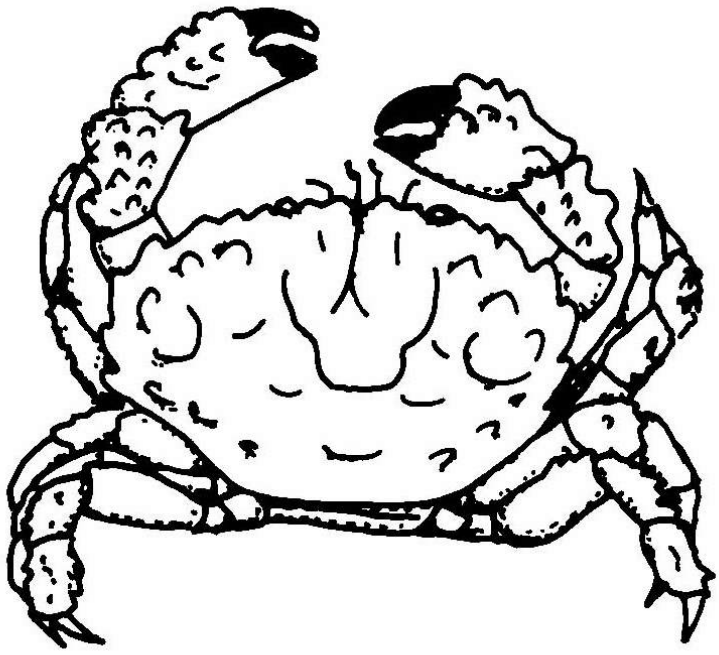
Enlarged tooth present at proximal end of cutting edge of dactyl of major cheliped----------7

7. Ambulatory legs with carpal and meral segments not pubescent. Carapace smooth. Carpus of chelipeds smooth or pitted, never covered with bumps---Lophopaneopus leucomanus (Lockington)

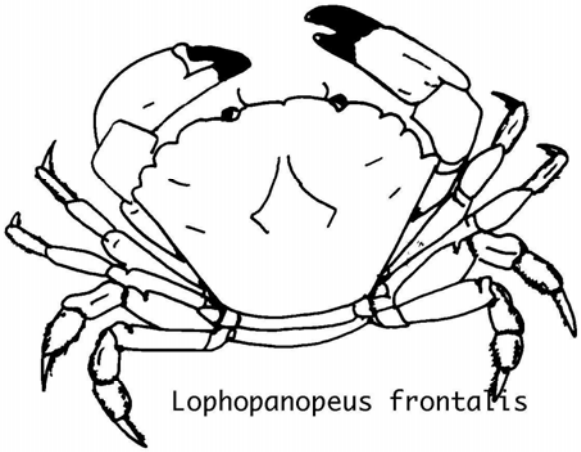
Ambulatory legs with carpal; and meral segments pubescent. Carapace pubescent. Carpus of chelipeds smooth or covered with irregular raised bumps---------Lophopaneopus bellus (Stimpson)



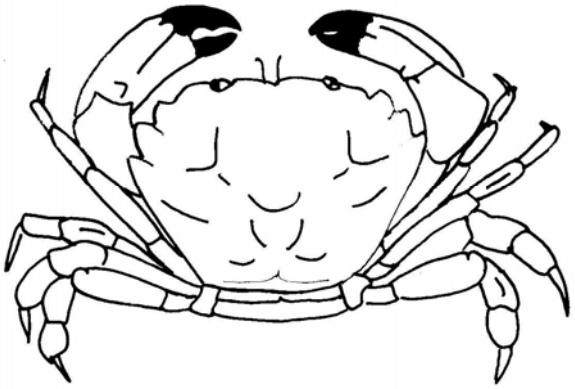
Pilumnus
spinohirsutus



Paraxanthias taylori



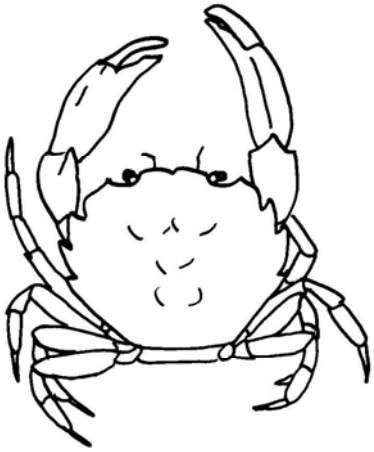
Lophopanopeus frontalis



Lophopanopeus leucomanus

Lophopanopeus
bellus

Cycloxanthops
novemdentatus



Rhithropanopeus
harrisii

Genus Paraxanthias Odhner

Paraxanthias taylori (Stimpson)

Xanthodes taylori Stimpson, 1860: 208, pl, 3, fig. 3.
Xanthias taylori.--Holmes 1900: 65.--Rathbun 1904: 185.--Schmitt 1921: 246, fig. 147.
Paraxanthias taylori.--Rathbun 1930: 466, pl. 188, pl. 189, fig. 1.--Carlton and Kuris 1975: 398, pl. 97, fig. 55.--Garth and Abbott 1980: 611, fig. 25.28.--Ricketts et al. 1985: 172, fig. 142.

Recognition characters.--Carapace nearly flat posteriorly, front divided by wide, rounded notch, with 4-5 anterolateral teeth, anterior half of carapace bearing bumps or tubercles. Chelipeds often unequal, carpus covered with rounded tubercles, hand with tubercles in 7-8 longitudinal rows; fingers stout and black; gaping in major chela. Walking legs covered with bristles. Carapace length 24.6 mm.
Color in life.--Dark red, lighter below, fingers black.
Habitat.--Intertidal to 100 m, among rocks, kelp holdfasts or among tube mollusks.
Range.--Monterey, California to Magdalena Bay, Baja California. Type locality Monterey.
Remarks.--Records of Paraxanthias taylori suggest that the species has a discontinuous distribution. Specimens have been collected from Monterey, Pacific Grove and Carmel Bay, and then south of Point Conception, especially from Santa Monica Bay southward into Baja California.


Paraxanthias taylori

Genus Cycloxanthops Rathbun

Cycloxanthops novemdentatus (Lockington)

Xanthodes ? novem-dentatus Lockington, 1877: 32.
Cycloxanthops rugosa Holmes, 1900: 59.
Cycloxanthops rugosus.--Rathbun 1904: 180.--Schmitt 1921: 240.
Cycloxanthops novemdentatus.--Holmes 1900: 56, pl. 1, fig. 2.--Rathbun 1904: 180, pl. 7, fig. 10.--Schmitt 1921: 239, pl. 37, fig. 7, text-fig. 142.--Rathbun 1930: 292, pl. 134, fig. 1; pl. 135, figs. 2-3, text-fig. 46.--Carlton and Kuris 1975: 398.--Garth and Abbott 1980: 608, fig. 25.23.--Ricketts et al. 1985: 172, fig. 141. (See Rathbun, 1930, for information on early synonyms).

Recognition characters.--Carapace broad, slightly convex, somewhat roughened toward anterior; front with deep, closed median notch (more evident in smaller individuals), anterolateral margin with 8-9 teeth besides postorbital tooth. Merus of third maxillipeds obliquely truncate at anterior end. Carpus of chelipeds roughened, with 2 blunt teeth at antero-internal angle; hand roughened above, upper and lower margins nearly parallel; fingers long and grooved, not gaping. Ambulatory legs with setose margins, dactyls longer than propodi. Carapace length 23.9 mm.
Color in life.--Brown, purple or red, rarely white; fingers of chelipeds black, teeth along inner chela margins white.
Habitat.--Low intertidal zone to 73 m, tidepools, rocks, or among sea grasses or tube mollusks.
Range.--Monterey Bay, California to Magdalena Bay, Baja California. Type locality San Diego, California.
Remarks.--This is the largest xanthid crab of California, and the most likely to be confused with a species of the Cancridae.

Cycloxanthops novemdentatus

Genus Micropanope Stimpson

Micropanope latimanus Stimpson

Micropanope latimana Stimpson, 1871: 107.
Xanthodes latimanus Lockington, 1876: 31.
Xanthias latimanus.-- Holmes 1900: 66.--Rathbun 1904: 185.--Schmitt 1921: 247.
Micropanope latimanus.--Rathbun 1930: 433. (See this reference for more information on synonyms).

Recognition characters.--Carapace moderately convex, smooth except for granules along anterior and antero-lateral margins. Front broad. Chelipeds angular, palms broader than long, smooth and polished, strongly protuberant at postero-inferior angle; fingers as long as palm, deflexed and black. Chelipeds unequal, minor chela with fingers more deflexed than those of major chela. Ambulatory legs with slender dactyls, with sparse setae. Carapace length 7.1 mm. This species has never been illustrated.
Color in life.--"Marbled" (Lockington, 1877).
Habitat.--Not reported, but probably intertidal.
Range.--San Diego, California to Cape San Lucas, Baja California, and in Gulf of California from Mulege Bay, Port Escondido and San Jose Island. Type locality Cape San Lucas.
Remarks.--Despite the long synonymy of the species, all of the specimens seem to have been destroyed. Stimpson's material, Lockington's types and any other early specimens of the California Academy of Sciences probably were burned. The few records seem to indicate that the species should occur more frequently in Baja California Sur than in California, U.S.A. Garth (1986) noted that the genus Micropanope probably needs revision, so the discoverer of this crab may be able to add yet another synonym to the list.

Genus Rhithropanopeus Rathbun

Rhithropanopeus harrisii (Gould)

Pilumnus harrisii Gould, 1841: 326.
Rhithropanopeus harrisii.--Rathbun 1930: 456, pl. 183, figs. 7,8.--Carlton and Kuris 1975: 398.--Garth and Abbott 1980: 610, fig. 25.27.--Williams 1984: 401, figs. 316-317.--Ricketts et al. 1985: 296.

Recognition characters.--Carapace subquadrate, about as long as wide, sparsely pubescent toward anterolateral angles, lines of granules across carapace. Front almost straight, slightly notched. First anterolateral tooth fused with postorbital angle, followed by 2-3 other anterolateral teeth. Chelipeds unequal. Carpus with moderately developed internal tooth. Major chela with short fixed finger, strongly curved dactyl. Minor chela with proportionately longer fixed finger and long straight dactyl. Walking legs long, slender, compressed and somewhat hairy. Male carapace length 15.6 mm, female carapace length 12.4 (after Williams, 1984).
Color in life.--Brown above, pale below; fingers of chelae light-colored throughout their length.
Habitat.--Intertidal to 36.6 m, but usually shallow; rocks, oyster shells, or debris, often in

estuarine areas.
Range.--Native to southwestern Gulf of St. Lawrence, Canada to Veracruz, Mexico; introduced into parts of Europe and San Francisco and Coos Bays on west coast of U.S.A. Type locality Cambridge Marshes and Charles River, Massachusetts.


Rhithropanopeus harrisii

Genus Eurypanopeus A. Milne-Edwards

Eurypanopeus hyperconvexus Garth

Eurypanopeus hyperconvexus Garth, 1986: 11, fig. 6A-F.

Recognition characters.--Carapace convex, with rough lines forming ridges on carapace of female. Front with shallow notch and closed fissure. Frist and second anterolateral teeth fused, low; third and fourth teeth subequal, fifth tooth short and triangular. Merus of third maxilliped subrectangular. Chelipeds similar. Carpus with inner tooth blunt. Palm somewhat swollen, upper margins with faint double crest. Finger of major chela without large basal tooth, fingers of minor chela longer and more slender than those of major, neither chela with gape. Ambulatory legs slender, carpi without lobes, dactyls long. Male carapace length 10.5 mm, female carapace length 9.6.
Color in life.--Body not reported, but fingers of chelae with brown bases, color of immovable fingers extending short distance on palm, tips white.

Habitat.--Subtidal on rock and sand, 68-79 m.
Range.--Known only from type locality, 0.5-1 mile NW of Anacapa Island light, California.

Genus Lophopanopeus Rathbun

Lophopanopeus frontalis (Rathbun)

Lophozozymus frontalis Rathbun, 1893: 236.
Lophoxanthus frontalis.--Holmes 1900: 64, pl. 1, figs. 5-6.
Lophopanopeus frontalis.--Rathbun 1904: 181, p.. 7, fig. 8.--Schmitt 1921: 242, pl. 37, fig. 3; text-fig. 144.--Rathbun 1930: 323, pl. 152.--Garth and Abbott 1980: 610, fig. 25.26.--Ricketts et al. 1985: 296.

Recognition characters.--Carapace almost smooth, somewhat broader than long. Front prominent, with median notch; with 3 developed anterolateral teeth. Chelipeds with carpus and hand smooth, hand with large lobe on upper margin, dactyl without enlarged tooth. Ambulatory legs with carpus slightly bilobed, propodus with convex anterior margin. Male carapace length 17.2 mm.
Color in life.--Yellowish-brown, fingers of chela black, dark color extending to palm.
Habitat.--Intertidal to 37 m, among rocks and among mussels on pilings.
Range.--Santa Monica Bay, California to Magdalena Bay,, Baja California. Type locality San Diego.

Lophopanopeus leucomanus (Lockington)

Xanthodes leucomanus Lockington, 1876: 32.
Lophopanopeus heathii Rathbun, 1900: 137.--Rathbun 1904: 182, pl. 7, fig. 9.--Schmitt 1921: 243, pl. 37, fig. 1.
Lophopanopeus leucomanus.--Rathbun 1904: 182.--Schmitt 1921: 243, pl. 37, fig. 6, text-fig. 145.--Rathbun 1903: 324, pl. 153, figs. 5,9; pl. 154, fig. 4.
Lophopanopeus leucomanus leucomanus.--Menzies 1948: 10, pl. 2, figs. 9-14; pl. 5, fig. 35.--Campos and de Campos 1989: 175.
Lophopanopeus leucomanus heathii.--Menzies 1948: 13, pl. 2, figs. 15-16; pl. 5, fig. 34.--Carlton and Kuris 1975: 399, pl. 97, fig. 60.--Garth and Abbott 1980: 610.--Ricketts et al. 1985: 169, fig. 137.

Recognition characters.--Carapace with anterior half irregularly roughened; granulated patch on hepatic region, front with shallow notch, 3 developed anterolateral teeth. Carpus of chelipeds smooth to pitted. Movable finger of major chela with strong basal tooth. Carpus of ambulatory legs slightly to strongly bilobed, without pubescence, propodus broad. Male carapace length to 12.2 mm.
Color in life.--Highly variable: white, dark red, brown, gray or mottled; legs may have different color than carapace; fingers of chelae with dark color not extending back on palm.
Habitat.--Intertidal to 200 m, among rocks, tidepools and tube mollusks.
Range.--Moss Beach, San Mateo County, California to Cedros Island, Baja California, Mexico. Type locality Monterey, California.

Remarks.--There are two subspecies of this species. The typical form, L. leucomanus leucomanus (Lockington), ranges from Carmel to Cedros Island. The carpus of the cheliped bears a network of lines ("reticulating ridges") which extends to the palm of the chela. The carpus of the walking legs is bilobed. L. leucomanus heathii Rathbun ranges from Moss Beach to La Jolla, California. It does not have the reticulating ridges on the carpus, and the carpus of the walking legs is barely bilobed. See Menzies (1948) for further details.

Lophopanopeus bellus (Stimpson)

Xantho bella Stimpson, 1860: 204, pl. 5, fig. 2.
Lophopanopeus bellus.--Rathbun 1904: 180.--Schmitt 1921: 241, p. 37, fig. 4, text-fig. 143.--Rathbun 1930: 320, pl. 150, 151.--Carlton and Kuris 1975: 399, pl. 97, fig. 59.--Ricketts et al. 1985: 305.
Lophopanopeus diegensis Rathbun, 1900: 137.--Rathbun 1904: 184, pl. 9, fig. 3.--Schmitt 1921: 245, pl. 37, fig. 5, text-fig. 146.--Rathbun 1930: 327, pl. 153, figs., 6,7, 10; text-fig. 49.
Lophopaneopus bellus bellus.--Menzies 1948: 4, pl. 1, figs. 1-5; pl. 5, fig. 38.--Garth and Abbott 1980: 609, fig. 25.24.--Campos and de Campos 1989: 175.
Lophopanopeus bellus diegensis.--Menzies 1948: 7, pl. 1, figs. 6-8.--Garth and Abbott 1980: 609.--Campos and de Campos 1989: 175.

Recognition characters.--Carapace with few granules on anterior regions, front with tiny notch, 3 developed anterolateral teeth, pubescent. Carpus of chelipeds with tubercles or roughened, tubercles continued on palm or not; major chela with enlarged tooth on movable finger. Carpus of ambulatory legs slightly to prominently bilobed, carpus and merus pubescent. Male carapace length to 13.7 mm.
Color in life.--Variable; bluish, red, yellowish, mottled with red, brown or gray; carapace and appendages may be of contrasting colors. Dark color on fingers of chelae does not extend to palm.
Habitat.--Rocks, under rocks in sand, tidepools, kelp holdfasts and bases of sea grasses, intertidal to 73 m.
Range.--Resurrection Bay, Alaska to off Cape Tortolo, Baja California. Type locality Monterey, California.
Remarks.--There are two subspecies of this species. L. bellus bellus (Stimpson) is the northern form, ranging from Alaska to Tortugas Bay, Baja California. It is most abundant north of Point Conception, California. In this subspecies, the carpus of the chelipeds may be smooth to roughened, but does not bear irregular raised bumps or tubercles. The carpus of the ambulatory legs is not markedly bilobed and does not have bumps. L. bellus diegensis Rathbun ranges from Monterey Bay to off Cape Tortola, Baja California, but usually is found south of Point Conception. The carpus of the chelipeds bears irregular raised bumps. The carpus of the ambulatory legs is markedly bilobed and has bumps.

Lophopanopeus bellus

Lophopanopeus bellus

Family Pilumnidae

Genus Pilumnus Leach

Pilumnus spinohirsutus (Lockington)

Acanthus spino-hirsutus Lockington, 1876: 32.
Pilumnus spino-hirsutus.--Holmes 1900: 67.
Pilumnus spinohirsutus.--Rathbun 1904: 185, pl. 7, fig. 2.--Schmitt 1921: 247, pl. 37, fig. 10.--Rathbun 1903: 503, pl. 203.--Garth and Abbott 1980: 611, fig. 25.29.--Ricketts et al. 1985: 172, fig. 143.

Recognition characters.--Carapace strongly convex, covered with stiff setae; median frontal lobes truncated and separated by prominent notch; each frontal lobe armed with 4-5 spines; orbits armed with strong spines; 5 anterolateral spines. spines. Chelipeds unequal, setose, carpus with spines, hand with several series of spines, fingers dark colored. Carapace length 25.4 mm.
Color in life.--Pale brown to golden brown. Transverse ridge in front of mouth area with bright red tint.
Habitat.--Intertidal to 25 m, among rocks or tube mollusks, tidepools, breakwaters and harbors.
Range.--Venice, Los Angeles County, California to Magdalena Bay, Baja California. Type locality San Diego, California.
Remarks.--This crab usually is well hidden under rocks or in holes. It seems to prefer warmer waters, and is common near outlets of power plants as in King Harbor at Redondo Beach, California.

Pilumnus spinohirsutus

Family Goneplacidae

Species of the Goneplacidae are most abundant in mud or sand. The family is well represented in tropical and subtropical regions, especially on the continental shelf, but only one species occurs in California.

Goneplacids have oblong orbits with relatively long eyestalks. The carapace bears marginal teeth; the front is less than half the width of the carapace. The third maxillipeds are moderately separated from each other. The legs are relatively slender and somewhat flattened; the chelipeds may be unequal in size and shape. The color may be white, yellowish, tan or mottled with red, but the crabs often are stained with the mud they inhabit.

Genus Malacoplax Guinot

Malacoplax californiensis (Lockington)

Eucrate ? californiensis Lockington, 1877a: 33.
Speocarcinus californiensis.--Holmes 1900: 77.--Rathbun 1904: 190, pl. 9, fig. 1.--Rathbun 1918: 42, text-fig. 16, pl. 10, figs. 2-3.--Schmitt 1921: 249, fig. 148, pl. 34, fig. 7.
Malacoplax californiensis.--Guinot 1969:259, fig. 27.--Garth and Abbott 1980: 612, fig. 25.30.--Ricketts et al. 1985: 357, fig. 274.--Hubbard and Dugan 1989: 55.

Recognition characters.--Carapace nearly smooth, front over 0.25X width of carapace, front notched in center; anterolateral carapace margins strongly curved and furnished with 3 teeth apiece. Third maxillipeds diverging anteriorly. Chelipeds unequal; carpus with spine on antero-internal angle, ridge at distal end of outer surface; hands wide and compressed, upper edge acute and sharply granulated, fingers ridged and nearly straight. Fifth pereopods upturned and relatively short. Carapace length 20.8 mm.
Color in life.--Brownish to white, chelae with tips of fingers black.
Habitat.--Intertidal zone to 33 m, but usually middle to low intertidal zones of mud flats.
Range.--Morro Bay, California to Magdalena Bay, Baja California; but usually south of Point Conception. Type locality San Diego, California.
Remarks.--Malacoplax californiensis, the California burrowing crab, is uncommon and may be endangered by habitat destruction.

Family Pinnotheridae

The pea crabs generally are commensals of larger invertebrates, including polychaete and echiuroid worms, pelecypods, large chitons, keyhole limpets, sea urchins, sea cucumbers and ascidians. The species generally associate with only one general type of host: those that live with polychaetes usually do not associate with mollusks and vice versa, for example. However, the associations are not known to be species-specific.

Pinnotherids have a rounded to rectangular carapace, often wider than long. Usually, the carapace is soft. Most pinnotherids are colored whitish to yellowish, but some, such as Opisthopus transversus, may have a spotted carapace and banded legs. The front, eyes and orbits may be reduced. The antennules fold transversely.

Sexual dimorphism is pronounced in certain pinnotherids, with males being smaller and having a less inflated body than the females. In others, the chelae of the male are more sturdy than those of the female. The dactyls of the ambulatory legs may be modified for crawling, grasping, or gripping the surface of a host. The ambulatory legs themselves may differ in size and shape from anterior to posterior.

Members of the family Pinnotheridae lately have undergone taxonomic revision. The generic placement of tropical species has been revised; males and females of sexually dimorphic groups have been matched so that some names applied only to one sex have been put into synonymy. For references prior to 1970, the account by Schmitt, McCain and Davidson (1973) remains valuable. The reader should be alert for further changes. The key below follows the work of Davidson (1968) and Zmarzly (1992). Zmarzly's study of species of Pinnixa should be consulted for additional anatomical details and illustrations.

Two species, Pinnotheres holmesi Rathbun, 1918 and P. nudus Holmes, 1895 have been reported from one and two specimens respectively, and have not been seen since their description. The reader should consult the work of Rathbun, 1918 for descriptions of each. These may be synonyms of other species.

Key to the Species of the Family Pinnotheridae

1. Ischium of third maxillipeds rudimentary or indistinguishably fused with merus; palp not more than 0.5X as large as merus-ischium. Carapace rounded, subquadrate or broadly transverse----------2

Ischium of third maxillipeds usually distinct from merus, although smaller and sometimes imperfectly joined with it; palp of larger size, usually about as large as merus-ischium. Carapace broadly transverse----------6

2. Carapace much broader than long, anterior margin nearly straight. Ambulatory legs diminishing in length from first to last, last very small----------Parapinnixa affinis Holmes

Carapace suborbicular or subquadrate, not strikingly wider than long. Ambulatory legs not successively diminishing in length from frist to last----------3

3. Carapace without 2 longitudinal, impressed lines leading posteriorly from middle of upper margin of orbit. (Commensal in ascidians)----------Pinnotheres pugettensis Holmes

Carapace with 2 longitudinal, impressed lines leading posteriorly from middle of upper margin of orbit. (Usually commensal in pelecypods, occassionally echinoderms, rarely ascidians)--------- 4

4. Female: second ambulatory legs unlike, right longer than left. (Male unknown). (Commensal in keyhole limpet, Megathura crenulata)----------Fabia canfieldi Rathbun

Female: second ambulatory legs alike. (Commensal in pelecypods, echinoderms and rarely ascidians)----------5

5. Female: Front sharply deflexed with transverse sulcus across vertical front between orbits; hand of cheliped widening distally and bearing two rows of setae along lower margin. Male: terminal abdominal segment semi-circular, immovable finger of chela bearing large serrate lobe on upper margin. (Alaska to La Jolla)----------Fabia subquadrata (Dana)

Female: Front sharply deflexed but lacking transverse suclus across vertical front between orbits; hand of cheliped not widening distally, bearing one row of setae along lower margin. Male: terminal abdominal segment widening distally with distal margin slightly deflexed, immovable finger of chela bearing 2 small teeth or lobes on upper margin. (San Pedro-Magdalena Bay)----------Fabia concharum (Rathbun)

6. Carapace about as wide and long, suborbicular. Ambulatory legs more or less subequal, second pair longest. Carapace spotted with red to purple---------Opisthopus transversus Rathbun

Carapace much wider than long. Third pair of ambulatory legs longest. Carapace whitish to brown, not spotted----------7

7. Third ambulatory legs not markedly longer than others, legs more or less subequal. Carapace hard and granulate anteriorly; lower anterolateral margin curving gradually into posterolateral margin----------Scleroplax granulata Rathbun

Third ambulatory legs markedly longer and larger than others. Carapace usually soft, if hard, not granulate; lower anterolateral margin forming angle with posterolateral margin--------8

8. Carapace strongly convex and hard, 1.5X wider than long. (Often commensal with holothurians)----------Pinnixa barnharti Rathbun

Carapace flat or slightly convex, more than 1.5X times wider than long. (Not commensal with holothurians)----------9

9. Dactyl of fourth pereopod shorter than propodus----------10

Dactyl of fourth pereopod equal to or longer than propodus----------14

10. Distal tip of dactyl of fifth pereopod falling short of or just reaching distal end of merus of fourth pereopod when both legs extended----------11

Distal end of dactyl of fifth pereopod reaching beyond distal end of merus of fourth pereopod when both are extended----------12

11. Posteroventral margin of ischium of fifth pereopod with 2-3 large tubercles; margins of fifth pereopod with long fringe of setae----------Pinnixa longipes (Lockington)

Posteroventral margin of ischium of fifth pereopod without tubercles; fifth pereopod without long fringe of setae----------Pinnixa tubicola Holmes

12. Ventral margin of propodus of fourth pereopod with 2 ridges, ridges granulate or serrate; dactyl of fourth pereopod spinous and slightly curved----------Pinnixa tomentosa Lockington

Ventral margin of propodus of fourth pereopod without ridges; dactyl of fourth pereopod smooth and strongly curved----------13

13. Male: fixed finger of chela slightly deflexed relative to palm; inner margin of dactyl of chela toothless. Female: fixed finger slightly deflexed; slight gape visible between opposing margins of fingers of chela when fingers tightly closed----------Pinnixa littoralis Holmes

Male: fixed finger of chela straight relative to palm; inner margin of dactyl of chela with single blunt triangular tooth. Female: fixed finger nearly straight; opposing margins of fingers of chela meeting tightly, no gape----------Pinnixa faba (Dana)

14. Anterolateral aspect of carapace with granulate or serrate ridge----------15

Anterolateral aspect of carapace smooth and round, without granulate or serrate ridge------19

15. Fixed finger of chela angled obliquely downward relative to palm----------16

Fixed finger of chela straight or curving upward; not deflexed----------17

16. Length of propodus of fourth pereopod l.5-2X width----------Pinnixa occidentalis Rathbun

Length of propodus of fourth pereopod at least 2.5X width----------
----------Pinnixa scamit Martin and Zmarzly

17. Anterior face of chela entirely smooth, without granules or with line of coarse granules just above ventral margin of propodus and scattered granules over rest of propodus----------
----------Pinnixa schmitti Rathbun

Anterior face of chela with line of tubercles or granules above ventral margin, rest of palm smooth or granulate----------18

18. Anterior face of chela with line of tubercles just above ventral margin, largely confined to region where fixed finger meets palm; rest of palm smooth----------Pinnixa hiatus Rathbun

Anterior face of chela with prominent line of densely packed granules forming ridge above

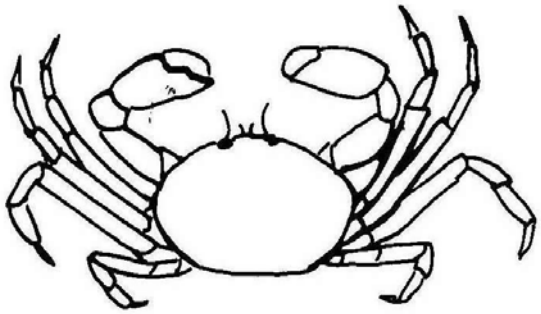
ventral margin, running most of length of propodus; dorsal margin of propodus granulate----------
----------Pinnixa franciscana Rathbun

19. Inner margin of dactyl of chela with single small triangular tooth at midpoint----------
----------Pinnixa weymouthi Rathbun

Inner margin of dactyl of chela toothless----------20

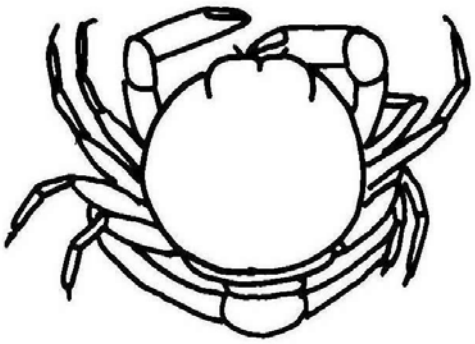
20. Fingers of chela long, about 2X as long as palm; tip of dactyl of fifth pereopod falling short of distal end of carpus of fourth pereopod when both legs extended----------
----------Pinnixa forficulimanus Zmarzly

Fingers of chela short, about as long as palm; tip of dactyl of fifth pereopod exceeding distal end of carpus of fourth pereopod when both legs extended----------Pinnixa minuscula Zmarzly

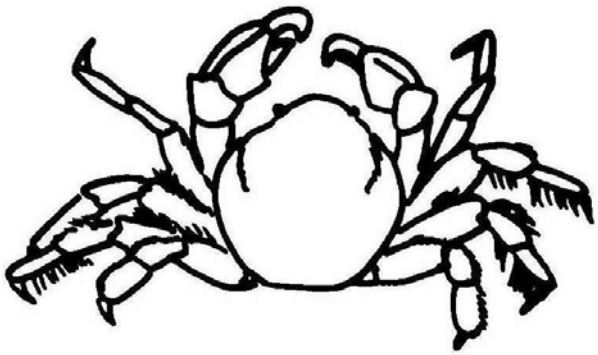


Scleroplax granulata

Opisthopus transversus



Fabia subquadrata



Fabia concharum

Genus Parapinnixa Holmes

Parapinnixa affinis Holmes

Parapinnixa affinis Holmes, 1900: 95.--Schmitt 1921: 255.--Glassell 1933: 321, pls. 20, 21.--Schmitt et al. 1973: 31.--Garth and Abbott 1980: 614, fig. 25.33.--Campos, Campos and Ramirez 1992: 756.

Recognition characters.--Carapace smooth and shining, transversely oval, anterolateral corner dilated and making straight line at anterior margin. Front broad and triangular, with short median groove. Orbit oval, inner hiatus wide and partly filled by basal segment of small, short antenna. Antennule folding obliquely. Buccal area small, broadly triangular. Ischium of third maxilliped rudimentary, merus large and triangular, with 3-segmented palp. Chelipeds stout and smooth, hand dilated, dactyl hooked at tip and armed with small tooth near middle of inner margin, upper side smooth; fixed finger with 2 teeth at tip and large triangular tooth extending from tip to proximal side of center. Single row of setae extending longitudinally from margin of carpus to fixed finger, gap of dactyl with fringe of short setae. First pair ambulatory legs larger than others; dactyl short and stout. Next two pairs ambulatory legs comparatively slender, with slightly longer dactyls; last pair small, reaching about to tip of merus of preceding pair, dactyls short and stout, slightly hooked. Merus of posterior three ambulatory legs compressed and broad. Abdomen with 7 segments, widest at third segment, seventh segment nerarly twice as long as broad. Carapace length to 3.6 mm long (Glassell, 1933).
Color in life.--Carapace light amber with mottling of dark ochre, protogastric and cardiac regions light orange; rarely white. Legs pale ochre with greenish tinge, dactyl yellow with white tip. Setae on second and third ambulatory legs reddish brown.
Habitat.--Bays and harbors, low intertidal zone among mud, sand, shells and algae; living in tube with polychaetes: Amphitrite sp., Terebella californica and Loimia montagui.
Range.--San Pedro to San Diego, California; La Bajada, Tortugas Bay, Baja California, Mexico. Most reports are from Newport Bay, Orange County. Reports from Sakhalin and the Kurile Islands may refer to Parapinnixa yokoyai Glassell. Type locality San Pedro, California.
Remarks.---Although Glassell (1933) was able to study "hundreds" of this crab, the California bay pea crab has rarely been reported since then. The type locality was dredged and turned into an industrial area; other protected bays have undergone various types of habitat destruction which have adversely affected this crab.

Genus Pinnotheres Bosc

Pinnotheres pugettensis Holmes

Pinnotheres pugettensis Holmes, 1900: 86.--Rathbun 1904: 185.--Rathbun 1918: 63, pl. 17, figs. 7, 8; pl. 18, fig. 1, text-fig. 39.--Schmitt et al. 1973: 82.--Garth and Abbott 1980: 613.--Hart 1982: 232, fig. 96.

Recognition characters.--Female: carapace soft, smooth, subpentagonal. Front triangular, curved downwards. Orbits nearly circular. Antennae short. Third maxillipeds oblique, strongly pubescent; merus narrow with outer margin convex; penultimate joint broad, subquadrate, distally truncated; dactyl inserted at lower proximal edge. Chelipeds smooth, merus short, upper

margin with setae, hands narrow, elongated and smooth, dactyl and inner side of palm short, pubescent, fingers nearly straight with hooked tips, dactyl with low tooth near base of inner margin. Ambulatory legs slender, increasing in length posteriorly, propodi setose, dactyls narrow, compressed and having the tip forming short, curved claw. Dactyl of fifth pereopods longer than propodus and longer than that of preceeding walking leg. Carapace length 10 mm.
Male: Smaller than female, entire body usually covered by dense brown pile. Carapace slightly longer than wide to about as long as wide, front produced and with a median sulcus, faint grooves along gastric and cardiac regions. Orbits and antennae small. Third maxilliped similar to that of female, but last two segments slightly shorter. Abdomen with 7 segments, tapering from proximal end to obtusely pointed apex. Chelipeds robust, chela with groove on inner surface from articulation of dactyl to proximal dorsal edge. Fingers of chelae with acute tips, crossing; fixed finger with row of sharp teeth on cutting edge. Walking legs decreasing gradually in length from first to last, but all robust and pilose. Second to fourth walking legs with long setae on propodus or propodus and carpus. Dactyls acute and long, subequal in size. Carapace length or width to 5.8 mm.
Color in life.--Female very pale, almost translucent white to yellowish, outer surface of palm of chela with light-colored net-like pattern. Male light brown.
Habitat.--Subtidal, commensal in large solitary ascidians, the sponge Tethya aurantium and the rock scallop Hinnites giganteus.
Range.--Spider Anchorage, British Columbia; Puget Sound, Monterey Bay and King Harbor, Los Angeles County, California. Type locality "Puget Sound".
Remarks.--This pinnotherid may be more common than the records suggest, but it cannot be collected without inspecting large ascidians and other invertebrates.

Genus Fabia Dana

Fabia canfieldi Rathbun

Fabia canfieldi Rathbun, 1918: 106, text-fig. 57, pl. 24, figs. 5, 7.--Schmitt 1921: 254, pl. 39, figs. 5, 6.--Schmitt et al. 1973: 22.

Recognition characters.--Female: Carapace broad, soft. Front without setae, with short, longitudinal median depression. Second segment of palp of third maxilliped small, shorter and narrower than first segment, terminal segment attached at middle. Palm of chela increases in width to distal end, fingers long, inclined downward, lower margin of propodus sinuous, fingers not gaping, setose on upper surface, prehensile tooth at middle of dactyl and smaller one at base of fixed finger. Ambulatory legs slender and subcylindrical, second leg on right side about 0.3X longer than on left; first leg stouter than others, propodi slightly curved, dactyls short, slender, with hooked tips except on second right pereopod, with dactyl long and straight. Carapace length about 5 mm. Male unknown. (Rathbun, 1918).
Color in life.--Not recorded, but probably white to yellowish.
Habitat.--In mantle cavity of keyhole limpet, Megathura crenulata. Depth not recorded, but probably low intertidal or subtidal.
Range.--Known only from type locality, Monterey, California.
Remarks.--Except for the peculiarly elongated legs and their assymetry, this species closely resembles the polymorphic Fabia subquadrata. However, that species usually associates with pelecypods. More study is needed to determine whether or not this is truly a distinct species.

Fabia subquadrata Dana

Fabia subquadrata Dana, 1851: 253.--Holmes 1900: 87 (in part).--Rathbun 1918: 102, pl. 24, figs. 1, 3; text-fig. 53 (part).--Schmitt 1921: 253, pl. 39, figs. 1, 2; text-fig. 150.--Davidson 1968: 85, fig. 1A. 1D, 1G, 1H.--Schmitt et al. 1973: 24.--Carlton and Kuris 1975: 398, pl. 96, fig. 53.--Garth and Abbott 1980: 612, fig. 25.31.--Ricketts et al. 1985: 221, fig. 179.--Campos-Gonzalez 1986: 238.

Recognition characters.--Carapace smooth, membranous, subquadrate; soft in adult female, hard in male. Female front sharply deflexed with transverse sulcus across vertical front between orbits. Anterolateral margin rounded, marked by round cluster of pits, male with dense pubescence along margin. Antennules in very wide grooves. Male with large orbits. Palp of third maxilliped about as long as adjacent segment, merus with small point on distomesial margin. Palm of chela widened distally, bearing 2 rows of setae along lower margin. Immovable finger with large serrate lobe on upper margin; dactyl with 1 large tooth on lower margin, upper margin with tuft of dense setae. Ambulatory legs with segments flattened, margins densely pubescent. Dactyls large, subequal and curved. Male abdomen with terminal segment semi-circular, lateral margins of penultimate segment distally depressed, broader at proximal end than distal but not markedly so. Male carapace length to 7.3 mm, female to 16.2.
Color in life.--Translucent whitish to yellowish, at times with dark areas on carapace.
Habitat.--Intertidal-subtidal. Usually commensal in pelecypods, especially mussels, Mytilus spp. and soft-shell clams, Mya arenaria, but also reported from other pelecypods, rarely sea urchins and ascidians. See Garth and Abbott (1980) for a list of hosts.
Range.--Akutan Pass, Aleutian Islands to Todos Santos Bay, Baja California, Mexico. Type locality "Puget Sound".
Remarks.--The grooved mussel crab perhaps is the largest and best known of the pinnotherids of the western coast of North America. However, its change of size, shape and habitat during its life cycle can cause confusion with other species. Smaller individuals are more setose and can swim. The first host usually is a clam. The crabs produce hard shells prior to molting, accomplished while the crabs swarm into the plankton. Ovigerous females develope a large, soft exoskeleton later when they move to a larger host, often a mussel. Males remain hard-shelled. See Garth and Abbott (1980) for further information and references on the life cycle.

Fabia concharum (Rathbun)

Cryptophrys concharum Rathbun, 1893b: 250 (in part).
Raphonotus lowei Rathbun, 1900c: 590.
Fabia lowei Rathbun 1918: 104, pl. 24, figs. 2, 4, text-fig. 55.--Schmitt 1921: 254, pl. 39, figs. 3, 4, text-fig. 151.
Pinnotheres concharum.--Rathbun 1918: 86, pl. 20, figs. 3-6, text-fig. 42 (in part).--Schmitt 1921: 252, pl. 38, figs. 1,2,3,4.
Fabia concharum.--Davidson 1968: 87, fig. 1B, 1C, 1E, 1F.--Schmitt et al. 1973: 23.--Garth and Abbott 1980: 613, fig. 25.32.

Recognition characters.--Carapace subpentagonal, slightly longer than broad, smooth, rigid, with ridge of coarse setae along anterior and anterolateral margins. Female front sharply deflexed,

lacking transverse sulcus across vertical front between orbits. Orbits circular, antennules large and nearly transverse. Palp of third maxilliped very small, merus produced on distomesial margin. Hand of cheliped not widened distally, bearing one row of setae along lower margin. Three anterior pair ambulatory legs subequal, fourth pair shortest, dactyls about as long as propodi and ending in curved hooks. Male abdomen with terminal segment widening distally, sixth segment hairless with margins subparallel, abdomen considerably wider near proximal end than at distal end. Male carapace length 3.0 mm, female 10.0.
Color in life.--Yellow-brown.
Habitat.--Intertidal-subtidal, commensal in mantle cavities of pelecypods. Males may move between hosts.
Range.--San Pedro, California to Turtle Bay, Baja California. Type locality San Diego Bay, California.
Remarks.--See Davidson (1968) for an explanation of the confusion between this species and Fabia subquadrata.

Genus Opisthopus Rathbun

Opisthopus transversus Rathbun

Opisthopus transversus Rathbun, 1893b: 252.--Holmes 1900: 97.--Rathbun 1904: 188, text-fig. 95.--Rathbun 1918: 173, pl. 37, figs. 4, 5; text-fig. 110.--Schmitt 1921: 268, pl. 44, figs. 4, 5, text-fig. 158.--Schmitt et al. 1973: 131.--Carlton and Kuris 1975: 398.--Garth and Abbott 1980: 618, fig. 25.42.--Ricketts et al. 1985: 105, fig. 80.--Campos, Campos and Ramirez 1992: 754.

Recognition characters.--Carapace somewhat rounded, convex, moderately hard. Front deflexed, almost straight, with slight median groove. Antennules well developed and set in deep notches. Third maxilliped with ischium well developed, merus broad, palp 3-jointed, last joint articulated on inner side of preceeding joint. Chelae short and stout. Ambulatory legs similar to each other, segments rather broad, dactyls curved and small. Abdomen of male narrow at base and tapering from third segment to end; abdomen of female wide and long. Male carapace length to 10 mm, female to 17.
Color in life.--Carapace mottled with vermilion to deep red, legs banded with red to purple, background white to cream.
Habitat.--Intertidal-subtidal, commensal in mantle cavities of pelecypods, gastropods (including large opisthobranchs),and giant chiton Cryptochiton stelleri, in cloacae of sea cucumbers, and with polychaete Chaetopterus variopedatus.
Range.--Monterey, California to San Ignacio Lagoon, Baja California; San Felipe, Baja California (Gulf of California). Type locality Monterey.
Remarks.--Evidence suggests that the color of the crab is dependent on the the habitat and host. Crabs that inhabit suspension-feeding pelecypods tend to have less color than those that live in deposit-feeding or grazing hosts. See Garth and Abbott (1980) for more information and references. After storms, the mottled pea crab may be cast ashore alive and away from a host. The crabs can crawl readily. Whether or not they move from host to host under normal conditions is not known.

Opisthopus transversus

Genus Scleroplax Rathbun

Scleroplax granulata Rathbun

Scleroplax granulata Rathbun, 1893b: 251.--Rathbun 1904: 188, pl. 7, fig. 5.--Rathbun 1918: 171, pl. 37, figs. 1-3, text-fig. 109.--Schmitt 1921: 267, pl. 44, figs. 1-3.--Schmitt et al. 1973: 96.--Carlton and Kuris 1975: 396.--Garth and Abbott 1980: 618, fig. 25.41.--Ricketts et al. 1985: 384, fig. 300.

Recognition characters.--Carapace subpentagonal, hard, granulate anteriorly and near margins, punctate elsewhere; front narrow, produced, slightly convex. Orbits nearly circular, eyestalks short and thick. Antennules almost transverse. Chela of male swollen and heavy, those of male not as large. Dactyl curved, fixed finger with large tooth, fingers gaping. Ambulatory legs slender, granulate, fourth pereopods longest. segments narrow and flattened, dactyls slender and almost straight, nearly as long as dactyls. Male abdomen narrow, tapering gradually to broad terminal segment, female abdomen fringed with setae. Male carapace length about 3 mm, female to 6 mm.
Color in life.--Grayish white, brownish, yellowish mottled with red-brown.
Habitat.--Intertidal to 13 m in bays and harbors, commensal with echiuroid worm Urechis caupo and ghost shrimps Neotrypaea californiensis and Upogebia pugettensis.
Range.--Roller Bay, Vancouver Island to Ensenada, Baja California; off Mazatlan, Sinaloa, Mexico. Type locality Ensenada.

Scleroplax granulata

Genus Pinnixa White

Pinnixa barnharti Rathbun

Pinnixa barnharti Rathbun, 1918: 149, fig. 91, pl. 32, text-fig. 91.--Schmitt 1921: 261, pl. 41.--Schmitt et al. 1973: 103.--Carlton and Kuris 1975: 407.--Garth and Abbott 1980: 614, fig. 25.34.--Ricketts et al. 1985: 338.--Zmarzly 1992: 679, figs. 2,3.

Recognition characters.--Carapace hexagonal, calcified, convex, antero-lateral margin with line of fine granules, surface coarsely pubescent towards sides, furrow behind gastric region shallow, 3 deep pits on each side anteriorly, posterior margin concave. Lobes of front prominent and arcuate. Orbits broadly oval. Antenna as long as width of front and one orbit. Chelipeds large, chelae dilated toward fingers, sinus in lower margin near base of fixed finger, which is subhorizontal, tip obliquely truncate, lower corner armed with short, sharp tooth, dactyl oblique, making gape with fixed finger, strong tooth in middle of dactyl, fringe of setae above, patch of setae in gape. Merus of cheliped and ambulatory legs setose above, merus and propodus of last 2 ambulatory legs setose below, carpus and propodus of last ambulatory leg setose above. Ambulatory legs thick, first nearly as long as second, third longest, propodus of all tapering, dactyl short and straight. Female carapace length 10.7 mm.
Color in life.--Creamy to brownish with brown mottling.
Habitat.--Low intertidal to subtidal, bays and sandy areas, commensal in cloacae of sea cucumbers, especially Caudina spp.
Range.--Puget Sound; Venice, California to Ballenas Bay, Baja California; Zihuatanejo, Guerrero, Mexico. Type locality Venice, California.

Pinnixa longipes (Lockington)

Tubicola longipes Lockington, 1876: 55.
Pinnixa longipes.--Holmes 1900: 92.--Rathbun 1904: 188.--Rathbun 1918: 137, figs. 80, 81.--Schmitt 1921: 257, text-fig. 152.--Schmitt et al. 1973: 113.--Carlton and Kuris 1975: 398, pl. 96, fig. 50.--Garth and Abbott 1980: 617, fig. 25.38.--Ricketts et al. 1985: 307, fig. 238.--Zmarzly 1992: 695, fig. 10.

Recognition characters.--Carapace more than 2X long as wide, with acute lateral angle, somewhat flattened, with transverse depression behind gastric area. Frontal area concave, disected by deep longitudinal groove. Anterolateral region smooth, rarely with weakly granulate ridge. Body entirely surrounded by fringe of long plumose setae. Chelipeds small, short and setose, chelae stout, those of mature male more robust than female. Inner margin of dactyl with single triangular tooth; inner margin of fixed finger irregularly serrated. Gape present when fingers closed. Anterior face of propodus with tubercles just above ventral margin. First 2 pairs ambulatory legs slender and similar, with long, slender and nearly straight dactyls nearly equal to length of propodi. Third ambulatory egs enormously developed relative to other legs. Posteroventral margin of ischium tuberculate. Dorsal margin of merus smooth to serrate, posteroventral margin of merus denticulate and propoduced as shelf. Ventral margin of propodus granulate. Dactyl short and thick. Last pereopod short, not reaching end of merus of third pereopod, slender, more stout than first two pereopods, dactyl short and stout. Carapace length 3.2 mm.
Color in life.--Pale brownish to yellowish white.
Habitat.--Intertidal to 128 m, commensal with polychaete worms, rarely echiurans; common in sandy sediments at 45 m.
Range.--Bodega Bay, California to Ensenada, Baja California, Mexico. Type locality Tomales Bay, California.

Pinnixa tubicola Holmes

Pinnixa tubicola Holmes, 1894: 569, pl. 20, figs. 17-18.--Holmes 1900: 91.--Rathbun 1904: 187.--Rathbun 1918: 165, fig. 103, pl. 36, figs. 5-8.--Schmitt 1921: 265, pl. 43, figs. 5-8.--Schmitt et al. 1973: 122.--Carlton and Kuris 1975: 398.--Scanland and Hopkins 1978: 636, figs. 1D-F, 2D-F.--Garth and Abbott 1980: 617, fig. 25.39.--Ricketts et al. 1985 82.--Zmarzly 1992: 709, fig. 16.

Recognition characters.--Carapace subcylindrical, 2.5X wide as long in female to 2X wide as long in male, tranvserse depression behind gastric region, from which carapace curves sharply downward; outer portion of anterolateral margin defined by ridge. Chelipeds small, hand oblong, fingers hooked at tips, inner margins meeting when closed, immovable finger curved upward distally; lower margin of palm convex. First pair ambulatory legs slender with slender dactyls equal in length to propodi, second pair longer and stouter than first, with relatively stouter dactyls, third pair stout, little longer than second with short and stout dactyls, last pair of ambulatory legs similar to but shorter than third, but not exceeding end of merus of third pair. Propodi of third and fourth pair ambulatory legs only slightly longer than wide, with inflated appearance. Length of carapace 4 mm.
Color in life.--Golden brown with spots of bluish gray or white on dorsal surface, lighter and uniform in color on ventral surface.

Habitat.--Commensal with polychaetes, often living in male-female pairs; intertidal to 57 m.
Range.--Prince Rupert, British Columbia to Blanca Bay, Baja California; unverified reports from "Alaska". Type locality not specified; type material from Trinidad (Humboldt County), Cape Mendocino and Bodega Bay, California.


Pinnixa tubicola

Pinnixa tomentosa Lockington

Pinnixa tomentosa Lockington, 1876: 156.--Rathbun 1918: 141, pl. 30, fig. 8, text-figs. 85, 86.--Schmitt 1921: 258, text-fig. 153.--Schmitt et al. 1973: 121.--Scanland and Hopkins 1978: 636, figs. 1A-C, 2A-C.--Garth and Abbott 1980: 617.--Zmarzly 1992: 706, fig. 15.

Recognition characters.--Carapace 1.7-2.5X long as wide, rounded and sloping toward margins; shallow depression behind gastric region, cardiac region swollen. Transverse depesssion behind margin of front; anterolateral margin with granulated line on branchial region. Both carapace and pereopods setose. Hand of chela oblong, margins convex. Fingers with hooked tips, each with small tooth near midpoint, not gaping when closed. First ambulatory leg slender and short, second leg nearly as long as third but less stout, dactyls of first and second legs slender and slightly curved. Third and fourth dactyls stout and short, not hooked. Third ambulatory leg broad, propodus nearly square, fourth leg similar to third but much smaller, reaching to end of merus of fourth leg. Female carapace length 7.5 mm.
Color in life.--Dull brown.
Habitat.--Commensal with polychaetes, especially Chaetopterus variopedatus; intertidal to subtidal (at least 21 m).
Range.--Monterey, California to Cape San Lucas, Baja California; in Gulf of California at San Felipe , Point Cholla and Angeles Bay. Type locality Angeles Bay, Gulf of California. Most records are from southern California.

Pinnixa littoralis Holmes

Pinnixa littoralis Holmes, 1894: 571, pl. 20, figs. 14-16. Rathbun 1904: 188.--Rathbun 1918: 145, pl. 31, figs. 5-8, text-fig. 89, 90.--Schmitt 1921: 260, pl. 40, figs. 5-8, text-fig. 155.--Schmitt et al.

1973: 112.--Carlton and Kuris 1975: 396, pl. 96, figs. 51A, 51B.--Garth and Abbott 1980: 616, fig. 25.36.--Ricketts et al. 1985: 377.--Campos-Gonzalez 1986: 238.--Zmarzly 1992: 693, fig. 9.

Recognition characters.--Carapace about 2X long as wide, pointed at sides, flattened above, with transverse depression behind median region. Orbits pointed at outer angle. Hands of chelipeds compressed, fingers gaping, especially in adult male, dactyl strongly curved, fingers usually without teeth. Ambulatory legs slender, third pair thickest. Propodus of each elongate, dactyl strongly curved and shorter than propodus on all legs. Merus of third ambulatory legs broad. Dactyl of last walking leg slightly exceeding end of merus of third leg when extended. Carapace length 4.5 mm.
Color in life.---Grayish white, often with brownish-tipped walking legs.
Habitat.--Usually living in mantle cavity of pelecypods, rarely with tube anemones (order Ceriantharia), intertidal to 91 m.
Range.--Sitka, Alaska to Santa Maria, Baja California, Mexico. Type locality Bodega Bay, California.
Remarks.--Pinnixa littoralis is easily confused with P. faba. See Zmarzly (1992) for additional information; however, juveniles of the two species may be nearly impossible to differentiate.

Pinnixa faba (Dana)

Pinnotheres faba Dana, 1851: 253.
Pinnixa faba.--Holmes 1900: 93.--Rathbun 1904: 188.--Rathbun 1918: 142, pl. 31, figs. 1-4, text-figs. 27, 88.--Schmitt 1921: pl. 40, figs. 1-4, text-fig. 154.--Schmitt et al. 1973: 108.--Carlton and Kuris 1975: 396, pl. 96, figs. 52A, 52B.--Garth and Abbott 1980: 615, fig. 25.35.--Ricketts et al. 1985: 377.--Zmarzly 1992: 682, fig. 4.—Schneider 1993: 842.

Recognition characters.--Carapace 1.5-1.9X long as wide, strongly convex, truncated at sides, no transverse ridge behind gastric area; anterolateral margins marked by low ridge; orbits oval. Female more rotund than male, with bilobed frontal region. Hands of chelipeds flattened, pubescent on inner side between fingers; fingers of female short and striaght, those of male curved and gaping. Male chela more robust than that of female. Ambulatory legs robust, carpus and propodus about equal in length, dactyl shorter than propodus and somewhat curved. Third ambulatory leg longest. Dactyl of last ambulatory leg reaching middle of carpus of third leg. Female carapace length 11.7 mm.
Color in life.--Brown to brownish red, dirty white, yellowish to pure white.
Habitat.--Usually symbiotic in mantle cavity of pelecypods, rarely gastropods, holothurians, and ascidians in sheltered intertidal areas.
Range.--Prince of Wales Island, Alaska to Camalu Point, Baja California, Mexico. Type locality Puget Sound, Washington.
Remarks.--The mantle pea crab is another common pinnotherid of intertidal habitats, but can be confused with P. littoralis. Males of P. faba have characteristic chelae in which the fixed fingers are straight and tapering to a conical tip; in P. littoralis, the fixed fingers are slightly deflexed and have excavated tips. Females of P. faba have fingers of the chelae without gapes; in P. littoralis, the fingers gape slightly when closed. For further details on differentiation of P. faba from P. littoralis, see Zmarzly (1992).

Pinnixa occidentalis Rathbun

Pinnixa occidentalis Rathbun, 1893: 248.--Holmes 1900: 89.--Rathbun 1904: 187, pl. 7, fig. 4, pl. 9, figs. 6, 6a (in part).--Rathbun 1918: pl. 34, fig. 1, text-fig. 96.--Schmitt 1921: 262, pl. 42, figs. 5,6; text-fig. 156.--Schmitt et al. 1973: 115.--Carlton and Kuris 1975: 407.--Zmarzly 1992: 700, fig. 12.

Recognition characters.--Carapace about 2X as long as wide, dorsal surface pitted and irregular. Carapace with cardiac crest, crest bilobed in males; anterolateral margin with granulated ridge running from orbit diagonally outward and backward, crossing hepatic region. Chelipeds stout and setose, immovable finger short and makedly deflexed, with stout tooth in middle and small tooth near apex; dactyl much curved, with or without tooth at middle. Male chela more robust than that of female, with proportionally shorter fixed finger having stout, flat tooth proximally. Ambulatory legs setose and with slender dactyls. First legs shorter than chelipeds, second pair longer and stronger than first, third pair longest, fourth legs reaching carpus of third leg and with dactyl as long as propodus. Male carapace length 9.5 mm, female 10.5.
Color in life.--Dirty white.
Habitat.--Subtidal to 439 m, in green sand or mud, commensal with echiuroid worms. Very common along continental shelf of southern California.
Range.--Unalaska to Magdalena Bay, Baja California. Unverified report from "Gulf of California". Type locality south of Unimak Island, Alaska.

Pinnixa scamit Martin and Zmarzly

Pinnixa scamit Martin and Zmarzly, 1994: 354, figs. 1-2.

Recognition characters.--Carapace 2X wider than long, highly sculptured, with anterolateral ridge bearing pronounced and slightly anteriorly-curved teeth; frontal margin with deep median cleft; cardiac ridge present and granular. Chelipeds slightly dimorphic, left larger. Fixed finger slightly deflexed, nearly 0.5X length of palm. Dactyl and fixed finger each with pronounced tooth at approximately midlength and row small transparent teeth mergining distally into sharp ridge along cutting edges. Palm with scattered short setae and granules on outer surface, serrate ridge on dorsal border. Carpus and merus with acute teeth on dorsolateral and dorsodistal surfaces. Ambulatory legs long and slender. Each leg with row of well developed teeth on dorsal and ventral borders of merus, carpus and propodus. Dactyls more or less straight. Fourth pereopod longest; its propodus with ventral margin bearing two ridges. Carapace width 7.4 mm.
Color in life.--Not reported.
Habitat.--3ll m, "soft bottom".
Range.--Known only from type locality, western Santa Barbara Channel, SSW of Point Arguello, California.

Pinnixa schmitti Rathbun

Pinnixa schmitti Rathbun, 1918: 162, pl. 35, figs. 6,7,9; text-fig. 101.--Schmitt 1921: pl. 42, figs. 7-9, text-fig. 157.--Schmitt et al. 1972: 120.--Carlton and Kuris 1975: 407.--Garth and Abbott l980: 617.--Ricketts et al. 1985: 387,.--Zmarzly 1992: 702, figs. 13, 14.

Recognition characters.--Carapace 1.8-2.2X wider than long, laterallly truncate; with prominent ridge of small, tightly packed granules curving along dorsal surface and ending at hepatic region. Numerous scattered granules along fronto-lateral parts of carapace. Perimeter of dorsal carapace pitted. Gastric region with transverse depression. Palm of chela swollen, upper and lower surfaces sinuous to slightly convex; outer and upper surfaces granulate in female, shiny and smooth in mature male. Tips of fingers of chela curving inward, without gape in fmelae, with small gape in male. Inner margin of dactyl with small proximal tooth, fixed finger with several small teeth toward proximal end. Carpus of female cheliped scalloped. Ambulatory legs setose, with relatively long and slender dactyls. Rows of granules on merus of each ambulatory leg and also on carpus and propodus of last 2 pair walking legs.Third pair ambulatory legs longest, fourth pair reaching carpus of third pair. Carapace length 5 mm.
Color in life.--Not reported.
Habitat.--Intertidal to 146 m, in sand, commensal with echiuroids, holothurians, polychaetes, callianassids and rarely ophiuroids. Common in bays.
Range.--Port Levasheff, Unalaska, Alaska to San Diego, California. Type locality San Francisco Bay, California.

Pinnixa hiatus Rathbun

Pinnixa hiatus Rathbun, 1918: 164, pl. 36, figs. 1-4, text-fig. 102.--Schmitt 1921: 265, pl. 43, figs. 1-4.--Schmitt et al. 1972: 111.--Zmarzly 1992: 690, fig. 8.

Recognition characters.--Carapace about 2X wide as long, anterolateral margin without definite angle and marked by raised and granulate ridge up to hepatic region; posterior margin long and straight; front advanced and widely emarginate. Surface smooth, sparingly punctate, groove behind gastric region. Subhepatic region prominent. Chelae robust. Palm suboblong, upper margin convex, lower margin of palm and fixed finger with granulate ridge on distal half just above lower edge. Dactyl curved, with ridge and tooth near middle. Fixed finger shorter than dactyl and curving up toward it, having large tooth; in male, finger deeply excavate at distal tip and forming notch into which tip of dactylus can insert. Fingers gaping when closed. First ambulatory leg most slender. Dactyls of walking legs elongate and slender. Anterior edge of merus and posterior of propodus of each finely serrate, posterior edge of merus coarsely granulate. Posterior margin of third leg and both margins of last leg fringed with setae. Female carapace length 3.6 mm.
Color in life.--Not recorded.
Habitat.--Subtidal, 27-100 m, in green sand or mud. Commensal associations unknown.
Range.--Goleta, Santa Barbara County to San Diego and offshore islands, California. Type locality off Santa Catalina Island, California.

Pinnixa franciscana Rathbun

Pinnixa franciscana Rathbun, 1918: 161, pl. 35, figs. 1-4, text-fig. 100.--Schmitt 1921: 263, pl. 42, figs. 1-4.--Schmitt et al. 1973: 110.--Carlton and Kuris 1975: 398.--Garth and Abbott 1980: 671, fig. 25.38.--Ricketts et al. 1985: 307, fig. 238.--Zmarzly 1992: 687, fig. 7.

Recognition characters.--Carapace about 2X as wide as long, pitted, with blunt, straight cardiac ridge and granulate ridge running from orbit to branchial region. Palm of chela densely granulate, with ridge just above lower edge continued to end of fixed finger, finger fringed with setae and with line of granules through middle. Fingers wide, slightly gaping, tips crossing, dactyl with large triangular tooth, fixed finger also with tooth. Dactyls of walking legs slender. First walking leg reaching middle of dactyl of second. Third leg much larger than others. Dorsal margin of merus, carpus and propodus serrate, ventral margin of merus also serrate. Fourth leg setose, reaching middle of carpus of third. Female carapace length 5.7 mm.
Color in life.--Dirty brown to golden brown.
Habitat.--Intertidal to 47 m, sandy mud, commensal with echiurans, polychaetes and callianassid shrimp.
Range.--San Francisco Bay, California to Turtle Bay, Baja California. Type locality San Francisco Bay.


Pinnixa franciscana

Pinnixa weymouthi Rathbun

Pinnixa weymouthi Rathbun, 1918: 166, pl. 36, figs. 9-10, text-fig. 104.--Schmitt 1921: 266, pl. 43, figs. 9-10.--Schmitt et al. 1973: 124.--Carlton and Kuris 1975: 396.--Garth and Abbott 1980: 618, fig. 25.40.--Zmarzly 1992: 710, fig. 17.

Recognition characters.--Carapace smooth, sides subtruncate, anterolateral angels prominent; front advanced but deflexed, weakly bilobed; transverse depression in gastric region. Palm of chela with short coarse setae and scattered granules. Dactyl setose dorsally, longer than fixed finger, with small traingular tooth toward proximal end and row of small teeth near tip of dactyl. Fixed finger with triangular tooth at middle and small teeth opposite those of dactyl. Fingers with small gape proximally when closed. Ambulatory legs fringed with setae, with nearly straight dactyls. Fourth leg longest and thickest. Ventral margin of propodus of second

ambulatory leg with 6 spines, that of third or fourth ambulatory leg with 4 spines. Dactyl of last walking leg extending to carpus of third leg. Male carapace length 3.3 mm.
Color in life.--Yellowish white.
Habitat.--Low intertidal zone to 10 m, in polychaete tubes.
Range.--Monterey and Pacific Grove, California. Type locality Monterey Bay, California.

Pinnixa forficulimanus Zmarzly

Pinnixa forficulimanus Zmarzly, 1992: 685, fig. 6.

Recognition characters.--Carapace 1.8-2.2 X wide as long, flattened, shiny, dorsal surface with shallow pits, anterolateral region smooth and lacking ridge. Slight depression in gastric region. Frontal margin straight; median groove not well developed. Chela small and scissorslike, with long, thin fingers. Fingers about 2X palm, tips crossing when closed. Palm of chela sparsely setose, dorsal margin of dactyl also setose. Ambulatory legs similar in form and flattened, with smooth margins. Third pair legs more robust than others. Dactyls slender and straight to slightly curved. Tip of dactyl of last walking leg reaching middle of carpus. Carapace length about 2 mm.
Color in life.--Carapace translucent, organs visible within, with brown coloration.
Habitat.--Sandy areas, 12-46 m. Commensal associations unknown.
Range.--Santa Cruz to San Diego, California. Type locality Santa Cruz, California.

Pinnixa minuscula Zmarzly

Pinnixa minuscula Zmarzly, 1992: 697, fig. 11.

Recognition characters.--Carapace oval, 1.7-2.0X wider than long, surface smooth and flat, anterolateral region smooth and without ridge, with slight depression in gastric region. Ventrally directed edge of anterolateral region granulate, sometimes with long plumose setae. Chelae sexually dimorphic. Female and immature male with fingers about equal in length ot palm, tips of fingers curving inward, tip of dactyl closing into toothed pocket on fixed finger. Dorsal margin of dactyl with 6-10 tubercles, sparsely setose. Inner margin of dactyl concave, with small serrrations. Fixed finger robust, with small serrations. No gape when closed. Mature male with more robust chela, palm wider than in female and fingers relatively shorter. Ambulatory legs flattened, with long slender dactyls. Third ambulatory leg most robust, its propodus with 4-6 sharp spines on ventral margin. Dactyl of last ambulatory leg reaching distal end of carpus of preceeding leg. Carapace length about 2 mm.
Color in life.--Carapace somewhat translucent, internal organs visible within, otherwise orange brown.
Habitat.--Sandy substrates, 27-50 m. Commensal associations unknown.
Range.--Goleta, Santa Barbara County to San Diego, California. Type locality San Diego.

Family Ocypodidae

The ghost crabs and fiddler crabs are common in sandy areas, marshes and mangroves swamps of tropical areas; however, only one species lives in southern California. Previous records of Oycpode gaudichaudii Milne Edwards and Lucas and Uca musica Rathbun from California, U.S.A. and Vancouver Island, British Columbia are based on incorrect locality labels. Both of these species do not occur north of Magdalena Bay, Baja California or the Gulf of California.

These active crabs possess elongate stalked eyes that fold into long transverse orbits. The third maxillipeds almost cover the rounded oral field. The carapace is more or less rectangular and without lateral teeth. Members of the family are almost entirely intertidal, although some may construct deep burrows. The reader should consult the volume by Crane (1975) for an exhaustive treatment of the species of Uca worldwide.

Genus Uca Leach

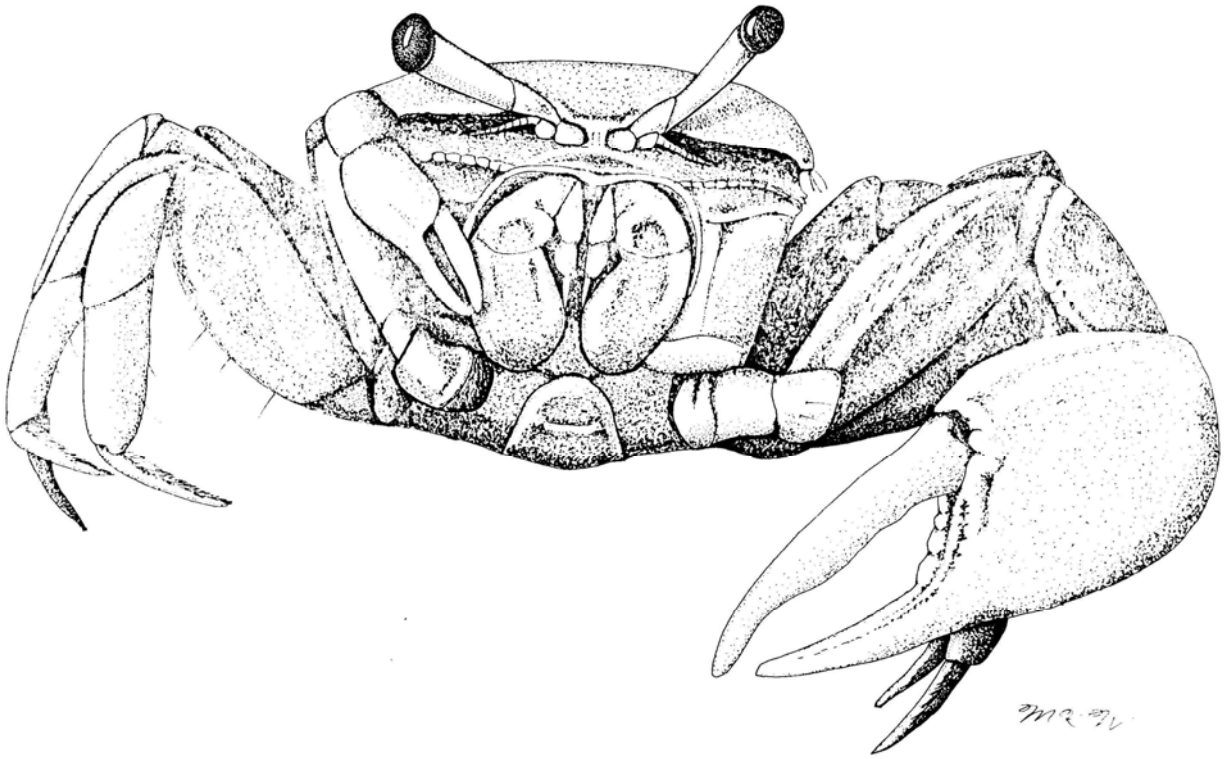
Uca crenulata crenulata (Lockington)

Gelasimus crenulatus Lockington, 1876: 149.
Uca crenulata.--Holmes 1900: 75, pl. 1, figs. 7-9.--Rathbun 1904: 190.--Rathbun 1918: 409, pl. 146.--Schmitt 1921: 279, fig. 164.--Ricketts et al. 1985: 354, fig. 273.
Uca crenulata crenulata.--Crane 1975: 232, pl. 30 E-I, figs. 70D, G, 101.--Garth and Abbott 1980: 622, fig. 25.46.--Bonfil, Carvacho and Campos 1992: 50, fig. 5B.

Recognition characters.--Frontal region, narrow, less than 0.3X width of carapace. Orbits nearly straight, suborbital margins with rounded tubercles. Carapace smooth, moderately convex; lateral margins nearly parallel behind acute anterolateral angles, then converging. Male major cheliped with outer surface finely granulated; inner surface with oblique tuberculate ridge running vertically down from dorsal surface, then bending obliquely to run somewhat parallel to gape; two rows of denticles at base of fixed finger. Fingers of old male cheliped longer than those of younger male. Smaller chela of both sexes with fingers equal, gape narrow. Ambulatory legs with pile, merus transversely granulate. Abdomen of male with 7 segments. Carapace length to 13 mm in either sex. (See Crane, 1975 for more detailed description).
Color in life.--Carapace grayish white to pale brown. Major chela of male with merus bright red on exterior surface, inner surface of merus and fingers of chela bright white, Palm and inner part of chela yellowish to white. Minor chela pinkish. Merus of first walking leg crimson red; otherwise cream-colored; other legs marked with cream. Female chelae brownish to cream-colored.
Habitat.--Upper parts of mud flats and salt marshes.
Range.--Discontinuous; from Goleta, California to Turtle Bay, Baja California, including Santa Catalina Island, California; and San Felipe to La Paz and Guaymas to Tenacatita Bay, western Mexico. Type locality Todos Santos Bay, Baja California. A distinct subspecies, U. crenulata coloradensis (Rathbun), lives at the head of the Gulf of California.
Remarks.--Fiddler crabs dig burrows in the upper reaches of mud flats and salt marshes. They manipulate balls of sediment in their mouthparts as they extract detritus and other food material. The burrows, mud balls and tracks are good indication of their presence even if the crabs themselves are not visible. The burrow may extend over 0.5 m into the sediment. Males

use the large chela in waving displays during courtship and in territorial interactions with other crabs. The crabs can autotomize limbs and regenerate them, which serves them well in escaping from predators such as black-crowned night herons. Because of their restricted habitat, fiddler crabs today live in California mostly in wildlife refuges and other areas protected from human habitat destruction.

Uca crenulata crenulata



Uca crenulata crenulata

Family Grapsidae

The shore crabs and their relatives, family Grapsidae, inhabit intertidal regions or floating objects. Fast-moving and hardy, they are conspicuous inhabitants of temperate and tropical regions world-wide. Their eyestalks are not as long as those of the Ocypodidae, but their vision apparently is keen. They tend to be scavengers and grazers on algae instead of deposit feeders. They do not construct long burrows, as do the Ocypodidae. The crabs often are sexually dimorphic, with the male being larger and more brightly colored than the female.

Except for the smallest crabs, which tend to be translucent to drably colored, colors tend to be species-specific in the grapsid crabs of California and Oregon. However, a rare color form, in which the carapace is either entirely china white to yellowish or patched with these colors, and the walking legs are banded, occurs in both species of Hemigrapsus.

Three species of the Grapsidae are common in intertidal areas of California and Oregon. Another two species rarely occur on floating objects, and may be cast ashore after severe storms. Holmes (1900, p. 84) described yet another grapsoid, Grapsodius eximius, from San Diego, California. This crab resembled a species of Pachygrapsus, but had the posterior surface of the orbits "bulging outwards". The crab has not been reported since its description, and may be an aberrant specimen of a species of Pachygrapsus. A record of Pachygrapsus transversus (Gibbes) from California (Schmitt, 1921) probably is in error. The species ranges from the southern Gulf of California south to Peru.

Key to the Species of the Family Grapsidae

1.Carapace as long as or longer than broad, subcircular, smooth. Anterior edges of ambulatory legs with thick fringe of setae. Pelagic, usually found among floating debris or on sea turtles----2

Carapace broader than long, square to somewhat trapezoidal, smooth or marked with grooves. Anterior edges of ambulatory legs without thick fringe of setae. Intertidal ----------3

2.Lateral margins of carapace convex, front with slight median depression. Upper margin of cheliped rounded----------Planes minutus Dana.

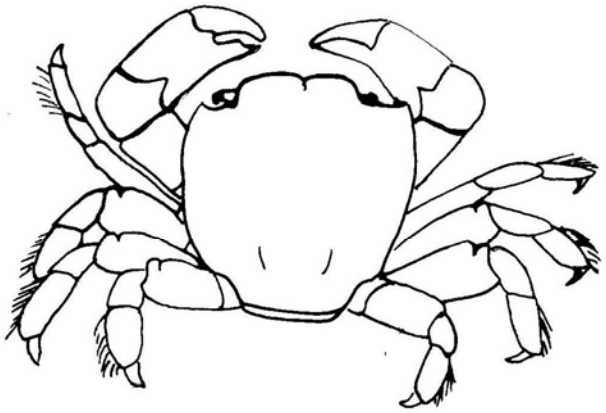
Lateral margins of carapace straight, front straight. Upper margin of cheliped angled----------Planes marinus Rathbun.

3.Carapace transversely striated. External maxillipeds with wide gape----------Pachygrapsus crassipes Randall.

Carapace more or less smooth. External maxillipeds with moderate gape----------4

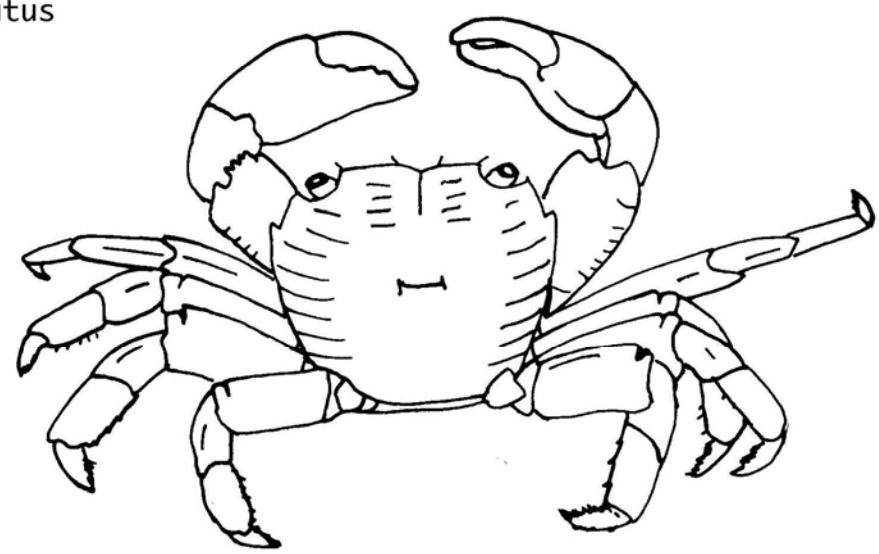
4.Ambulatory legs setose. Front with deep median sinus. Chelae not spotted with red or purple----------Hemigrapsus oregonensis (Dana).

Ambulatory legs smooth. Front somewhat sinuous. Chelae spotted with red or purple----------Hemigrapsus nudus (Dana).

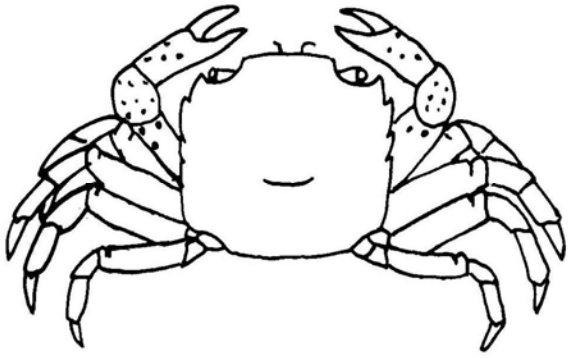


Planes minutus

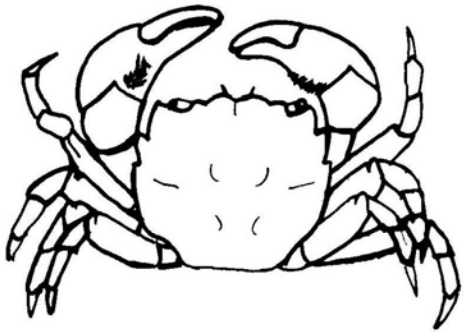
Planes marinus



Pachygrapsus crassipes



Hemigrapsus nudus



Hemigrapsus oregonensis

Genus Planes Bowdich

Planes cyaneus Dana

Planes cyaneus Dana, 1851: 250.--Chace 1951: 65.--Hart 1963: 127.--Chace 1966: 646.--Manning and Holthuis 1981: 235.
Planes minutus.--Rathbun 1904: 189.--Rathbun 1918: 253, pl. 63 (in part).--Schmitt 1921: 272, pl. 46.--Garth 1946: 510.
Not Planes minutus (Linnaeus, 1758).

Recognition characters.--Carapace as long as broad, subcircular, almost smooth but for few faint lines on anterior and lateral regions, single blunt tooth behind postorbital angle, front sinuous. Chela broad, fingers somewhat deflexed, with several oblique lines on dorsal and ventral surfaces, somewhat obscure longitudinal line on lower portion of propodus; one tooth on inner margin of lower finger and 2-3 on dactyl. Ambulatory legs broad, somewhat flat, especially propodus and dactyl, anterior margins with dense fringe of setae, 1-3 spinules on lower distal margin of merus. Carapace length 15 mm.
Color in life.--Two color phases: mottled with yellowish brown or dark brown and white; or blue.
Habitat.--Pelagic among floating debris and barnacles (Lepas spp.) or on sea turtles, often near tail of turtle.
Range.--Widespread between 41º N and 35º S in Pacific; eastern Pacific from off British Columbia to Peru; Indian Ocean, southern Atlantic Ocean; rare in northern Atlantic and Gulf of Mexico.. Type locality Pacific Ocean at 28º N, 174ºE (west of Midway Island).
Remarks.--Specimens of P. cyaneus from off Panama were encrusted by the naked barnacle Conchoderma virgatum.

Planes marinus Rathbun

Planes marinus Rathbun, 1915: 120, pl. 3.--Rathbun 1918: 258, pl. 64.--Chace 1966: 646.
Pachygrapsus marinus.--Chace 1951: 65.--Edmondson 1959: 169, fig. 8b.--Hart 1963: 127.--Carlton and Kuris 1975: 408.

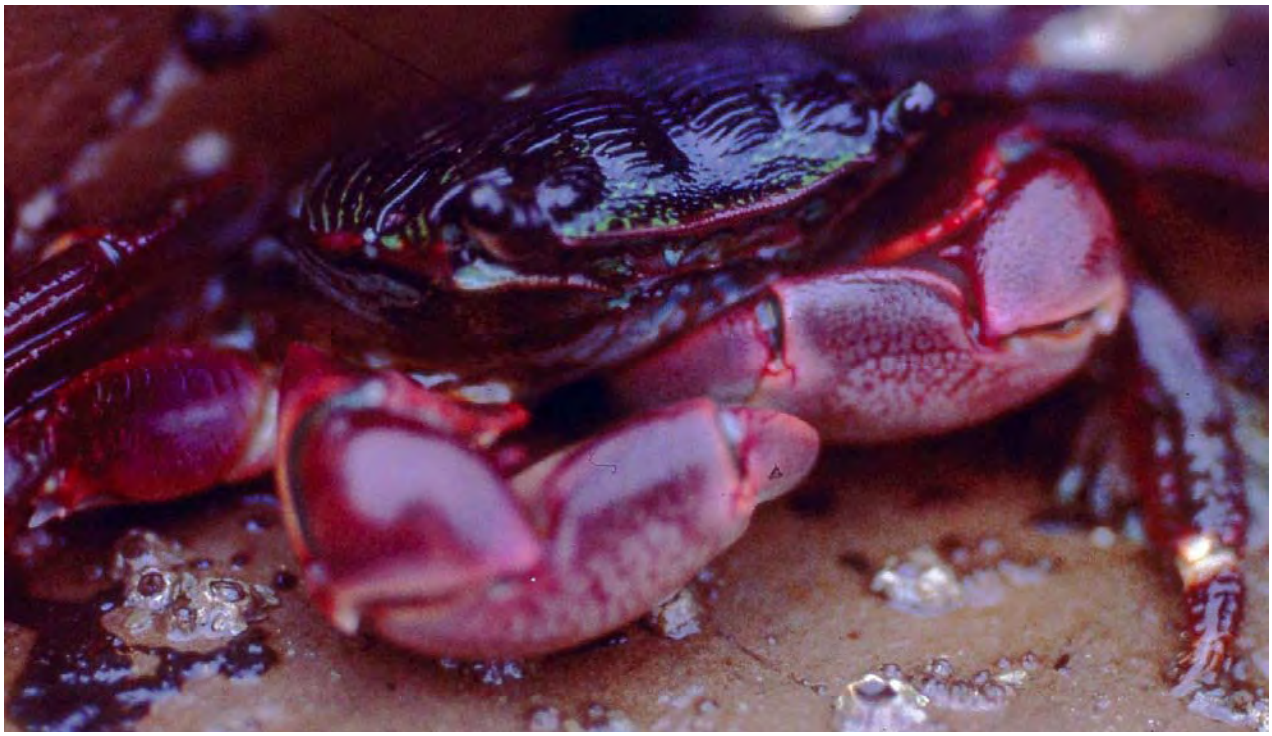
Recognition characters.--Carapace somewhat broader than long, lateral margins nearly straight and converging posteriorly, one blunt tooth behind postorbital tooth; front more or less straight; surface of carapace marked by grooves. Chelipeds heavy, merus marked by short lines, antero-distal border expanded and dentate; carpus with blunt tooth at inner angle, palm swollen, fingers curved and with teeth. Ambulatory legs short, flat, merus broad, anterior border of propodus with dense setae, dactyl short and bearing spines and setae. Male carapace length 9 mm, female carapace length to 15 mm.
Color in life.--Not reported.
Habitat.--On floating objects.
Range.--British Columbia to Baja California, off Oahu, Hawaiian Islands; New Zealand, off St. Helena in southern Atlantic. Type locality west of "Lower California".
Remarks.--There are fewer reports of this species than of Planes cyaneus in California and Oregon. It has been taken at sea off British Columbia and been cast ashore in Oregon. Planes cyaneus and Planes marinus may co-occur on the same drifting log.

Genus Pachygrapsus Randall

Pachygrapsus crassipes Randall

Pachygrapsus crassipes Randall, 1839: 125, pl. 5, fig. 4.--Holmes 1900: 79.--Rathbun 1904: 189.--Rathbun 1918: 241, pl. 59.--Schmitt 1921: 270, text-fig. 159, pl. 45.--Carlton and Kuris 1975: 393.--Garth and Abbott 1980: 619, fig. 25.43.--Ricketts et al. 1985: 42, fig. 27.

Recognition characters.--Carapace nearly square, lateral margins broadest behind orbit; entirely upper surface except cardiac and intestinal regions transversly grooved; sides with single tooth posterior to prominent postorbital tooth. Third maxillipeds with merus lobate at antero-internal angle. Chela of adult male broad and heavy, raised line present on upper side of propodus and smaller line on lower portion of outer surface, tips of fingers spooned. Female chela not as broad as male. Merus of each ambulatory leg broad, with tooth on posterodistal angle except on fifth legs; propodus and dactyl of each leg spinulose. Male carapace length 41 mm.
Color in life.--Carapace dark green with faint whitish stripes, inner surface of chela white, male chela bright red above, white below.
Habitat.--Upper intertidal rocks, sometimes docks and pilings or mud flats.
Range.--Charleston, Oregon to Santa Margarita Island and Alijos Rocks, Pacific coast of Baja California; sporadic in Gulf of California; also Japan and Korea. Type locality "Sandwich Islands", but probably an error. Most of Randall's specimens came from California, especially near Monterey, Los Angeles and San Diego.
Remarks.--Pachygrapsus crassipes is one of the most common crabs of California and Oregon. The megalops larvae can ride on drifting seaweed or wood, thus giving the species great capacity for dispersal. The population in Asia may have been introduced in ballast water from ships.

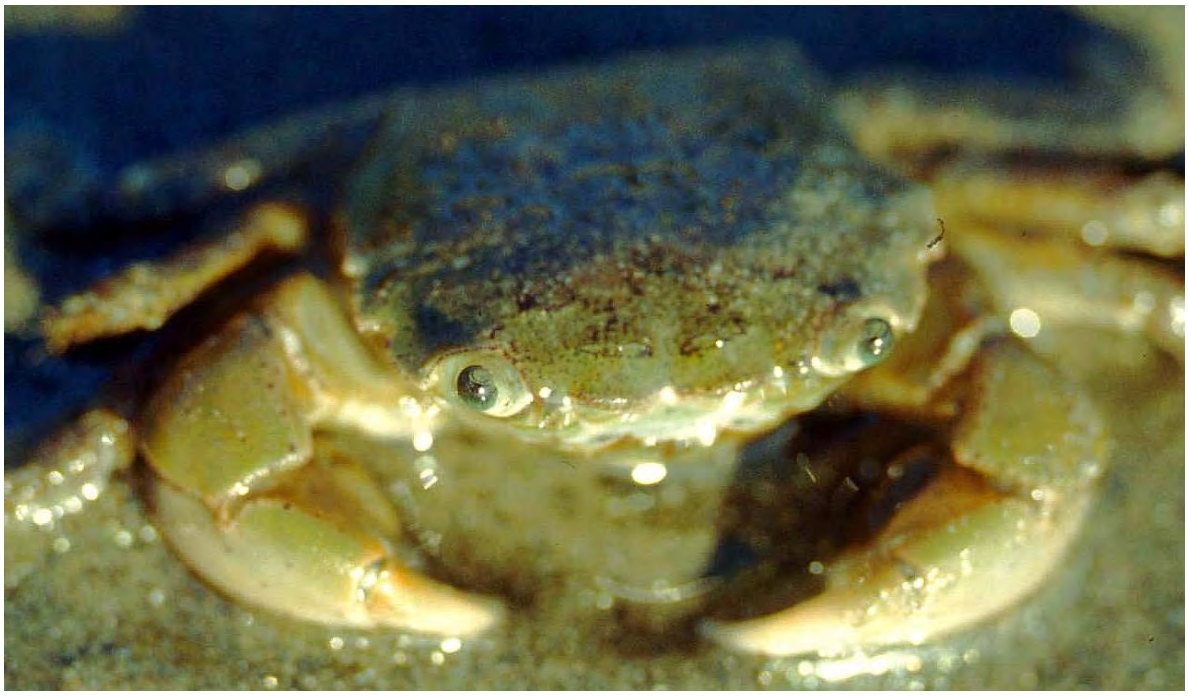

Pachygrapsus crassipes

Genus Hemigrapsus Dana

Hemigrapsus oregonensis (Dana)

Pseudograpsus oregonensis Dana, 1851: 248.--Dana 1852: 334.--Dana 1855: pl. 20, fig. 6. Hemigrapsus oregonensis.--Rathbun 1904: 189.--Rathbun 1918: 270, pl. 70.--Schmitt 1921: 274, text-fig. 162, pl. 48.--Carlton and Kuris 1975: 393, pl. 92, figs. 4A-D, 5.--Garth and Abbott 1980: 621, fig. 25.45.--Ricketts et al. 1985: 358, fig. 275.--Bonfil, Carvacho and Campos 1992: 39, fig. 1B.

Recognition characters.--Carapace more or less square and smooth, with two lateral teeth posterior to postorbital tooth. Front with deep median sinus. Chelipeds smooth, adult male with rounded lobe on antero-internal angle of merus and patch of setae on inner surface of propodus; fingers of cheliped curved, with teeth and spooned. Ambulatory legs with coarse, sparse setae, dactyls narrow. Male carapace length to 29 mm.
Color in life.--Greenish to muddy gray, sometimes with minute black dots; fingers of chela white and without red-purple spots.
Habitat.--Intertidal, usually salt marshes and mud flats but also quiet, protected tidepools and gravel flats.
Range.--Resurrection Bay, Alaska to Turtle Bay, Baja California, Mexico. Type locality "Puget Sound".
Remarks.--In bays and harbors, H. oregonensis can occur by the hundreds.


Hemigrapsus oregonensis

Hemigrapsus nudus (Dana)

Pseudograpsus nudus Dana, 1851: 249.--Dana 1852: 335.--Dana 1855: pl. 20, fig. 7. Hemigrapsus nudus.--Rathbun 1904: 189.--Rathbun 1918: 267, pl. 68.--Schmitt 19821: 273, text-fig. 161, pl. 47.--Carlton and Kuris 1975: 393.--Garth and Abbott 1980: 621, fig. 25.44.--Ricketts

et al. 1985: 358, fig. 275.

Recognition characters.--Carapace more or less square, posteriorly flat, front somewhat sinuous, with two lateral spines posterior to postorbital spines. Chelipeds smooth, fingers curved, with teeth on margins and spooned, larger in male than in female; male chela with patch of pile on inner surface of propodus. Ambulatory legs without setae, dactyls short. Length of male carapace to 45 mm.
Color in life.--Carapace dark red to purple, upper parts of ambulatory legs same color as carapace, lower parts yellowish to white; chelae with conspicuous spots of red to purple.
Habitat.--Tide pools, boulder and cobble fields, upper to mid-tidal zone.
Range.--Yakobi Island, Alaska to Turtle Bay, Baja California, but uncommon south of Point Conception, California. Type locality "Puget Sound". Records of this species from the Gulf of California are in error.
Remarks.--This is another very common intertidal crab.

Hemigrapsus nudus

partial albino Hemigrapsus nudus

Family Palicidae

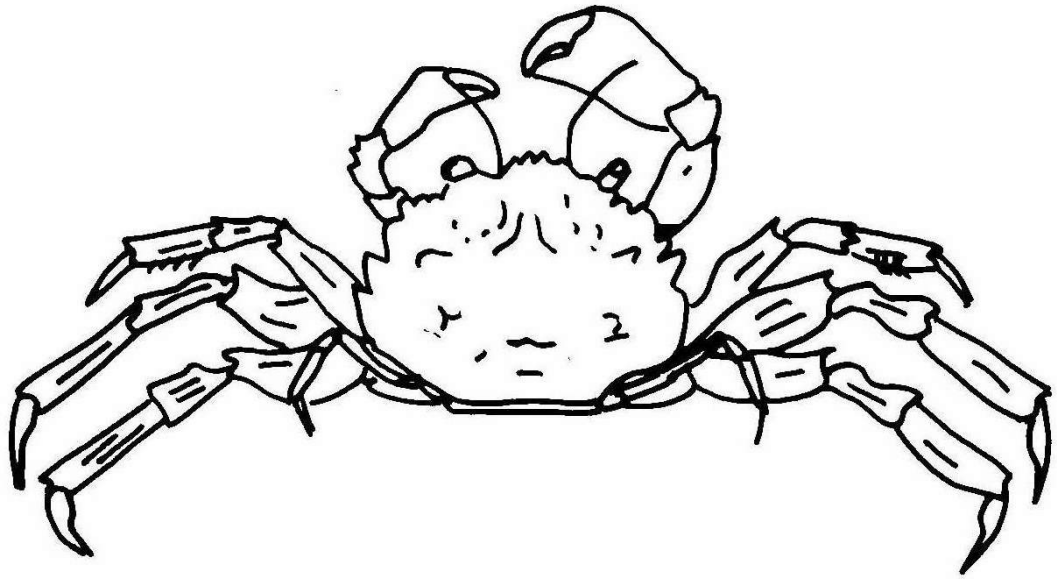
Only one species and only one specimen of this family have been reported from California. Older works refer to this family as the Cympolidae, but the generic name Cympolia has been found to be a homonyn. See Holthuis and Gottlieb (1958) for further information on the nomenclature of this family.

Genus Palicus Philippi

Palicus lucasii Rathbun

Palicus lucasii Rathbun, 1898: 600, pl. 43, fig. 2.
Cympolia lucasii.—Rathbun 1918: 193, pl. 44, figs. 1-2; text-fig. 119.—Garth 1947: 500, pl. 87 , fig. 1.

Recognition characters.—Eyes large. Carapace slightly wider than long, with 4 frontal lobes, anterolateral margin with 2 acute teeth beyond exorbital; supraorbital teeth sharp; dorsal surface of carapace tuberculate. In adult male, right chela heavier than left. Ambulatory legs wide, merus of legs 1 and 2 with sharp tooth at distal end; merus of leg 3 with rounded lobe. Dactyls of legs 2 and 3 with sinuous margins. In adult male, first walking leg with shaggy setae. Last ambulatory leg short, slightly longer than merus of leg 3. Male carapace length to 13.5 mm.
Color in life.—Carapace with solid median band of blood red extending from front to posterior border. Most of carapace white; anterolateral and preorbital teeth blood red, orbital tooth white. Legs 1-3 banded with red and white; tip of dactyl white; reduced leg entirely white (color notes by Garth, 1947).
Habitat.—Muddy and sandy bottoms, 9-111 m.
Range.—Off Malaga Cove, Palos Verdes Peninsula, California to Galapagos Islands. Type locality off Cape San Lucas, Baja California, Mexico.



Palicus lucasii

Crustaceans As Pets

With the increased interest in marine and freshwater invertebrates as pets or as display animals for schools and offices, numerous crustaceans are being imported into pet stores. Most of these are tropical species collected in the Philippines, Indonesia and Ceylon in the Indo-Pacific or off Florida in the Atlantic, but specimens also at times are imported from the Gulf of California, Mexico and eastern Africa. The popular book by Debelius (1999) gives names and photographs of many of these species. The majority of these animals, unable to tolerate cold temperatures, do not survive in the wild in California or Oregon.

Perhaps the most common pet crustacean is the land hermit crab, Coenobita clypeatus, from the Caribbean region. This semi-terrestrial crab stores water in its shell and its gill chambers. An omnivore, it eats commercial fish food pellets, dog food, soft plants and many other foods. In captivity, care should be taken not to give it food that will spoil or attract flies. It is wise to provide the crabs with a source of calcium carbonate, such as egg shell.

Coenobita is most active at night, although it will move around if sprayed with water at any time of day. These crabs normally release their larval stages into the ocean, and so will not readily reproduce in captivity.

At times, other live crustaceans such as fiddler crabs (Uca spp.), blue crabs (Callinectes sapidus), Maine lobsters (Homarus americanus) or other crustaceans may be available for sale from dealers in live bait, seafood dealers or biological supply companies. These animals should be used for food or investigation in the aquarium and not be released into the wild. State and federal laws are very strict regarding the introduction of potential pests into the western United States.

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