

Calappa gallus (Herbst) Latr., var. **galloides** (Stimp.). *Yellow Box Crab*.*Cancer gallus (pars)* Herbst, op. cit., iii, pt. 3, pp. 18, 46, pl. lviii, fig. 1, 1803.*Cancer (Calappa) gallus (pars)* Latr., Règ. Anim., iii, p. 24, 1817.*Calappa gallus* H. M.-Edw., Hist. nat. Crust., ii, p. 105, 1837. Dana, Crust.

U. S. Expl. Exp., p. 393, 1852. Capello, Journ. Sci. Math., Phys. Nat.

Lisboa, iii, p. 133, pl. ii, fig. 4, 1871 (W. Africa).

Miers, Voy. Challenger, xvii, p. 286, 1886 (Bermuda). Rankin, op. cit., p. 533.

M. J. Rathbun, Decapod Crust. W. Africa, Proc. U. S. Nat. Mus., xxii, p.

297, 1900; Brach. and Macr. Porto Rico, p. 85, 1901.

Cancer galloides Stimpson, Ann. Lyc. Nat. Hist. N. York, vii, p. 71, 1859.

FIGURE 45. PLATE XXVI, FIGURES 3.

Color of upper parts generally orange to orange-brown, becoming brighter on the front of the chelæ; under parts dull yellow. Carapace, above, and front of chelæ, covered with irregular spots of dark red or reddish brown, variable in size and form; many of the larger

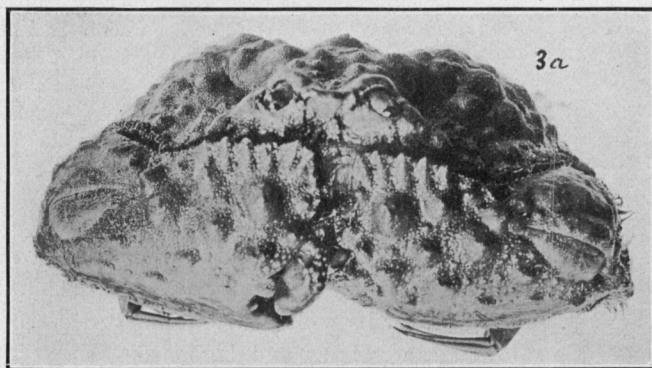


Figure 45.—*Calappa gallus, galloides*, front view, about nat. size. Phot. A. H. V.

granules and tubercles of the carapace are white, especially those that lie in rows on the posterior transverse ridges and those on the scattered elevations. This causes the elevations to appear higher than they really are. The digits of the chelæ are smoky horn-color, becoming blackish on the upper side of the dactyl. Ambulatory legs yellow, finely reticulated with red lines.

Measurements.

No.	Sex	Carapace		Front bet. orbits	Chelæ		Locality
		length	breadth total		length	height	
1903k	♂	51	66	8	{ r. 39 l. 38 }	{ 32 32 }	Bermuda

This was first recorded from Bermuda by Miers. We took good specimens in March, 1901, in shallow sandy places in Castle Harbor. The Bermuda Biological Station had it from Hungry Bay. It was also in Prof. Kincaid's collection (1903*k*). It was not in the early collections of Jones, Goode, etc.

The Atlantic form (var. *galloides*) ranges from Florida to Bahia, Brazil, and West Africa. Cape Verde Islands and Fernando Noronha (Miers). Common in the West Indies; Dominica I., in fish-traps, 20–30 fathoms (A. H. Verrill, 1906, Yale Mus.). Bahia (Rathbun).

The typical Pacific form (var. *gallus*) has a wide range through the Indian and Pacific Oceans; Red Sea; Persian Gulf, etc. Philippines (Miers).

Cycloes Bairdii Stimp., var. *atlantica* nov.

Cyclois Bairdii Stimpson, Annals Lyc. Nat. Hist. N. York, vii, p. 237 [109] 1860 (Cape St. Lucas). Verrill, these Trans. xi, p. 18, pl. ii, figs. 1, 2, 1901 (Bermuda).

Cycloës Bairdii M. J. Rathbun, Proc. U. S. Nat. Mus., xxi, p. 610, 1898; Brach. and Macr. Porto Rico, p. 85, 1901.

FIGURES 46, 47. PLATE XXVII, FIGURE 2.

The carapace is evenly rounded in front of the lateral teeth; surface strongly areolated and rough with unequal granules and low

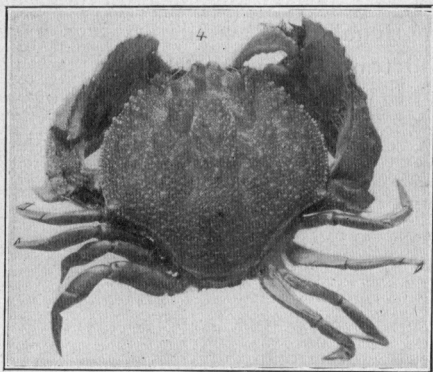


Figure 46.—*Cycloes Bairdii*, var. *atlantica*, No. 4050, $\frac{9}{10}$ nat. size. Phot. A. H. V.

rounded tubercles; a median row and two or three irregular series on each side most prominent; antero-lateral margins with many small unequal denticles and granules; posterior lateral tooth larger, triangular, with the tip bent forward and acute. Front with two

subacute denticles. Chelipeds strongly granulated, and with a few irregularly arranged small tubercles on the outer surface of the manus; lower margin double, with two rows of large granules; crest high and convexly rounded, with seven acute angular teeth, of which the third is highest; dactylus of one chela (the right in our specimens) with a large, stout, downward bent tooth near the base, when closed fitting into a socket between a tooth on the thumb and a large obtuse tooth on the manus; a large, flat, rounded distal tooth near the lower edge.

Its colors are bright in life. The carapace is pale yellow or whitish with lemon-yellow spots in irregular rows, and many small bright red or crimson spots, especially laterally. Chelipeds and legs bright yellow, spotted and banded with bright scarlet red; chelæ with a crescent of red at the articulation of the dactylus on the inside; tips of digits and teeth of the dorsal crest of manus red; carpus with two red spots. Legs bright yellow, with bands of red and purple, and purplish red margins on the merus; eye stalks orange.

There is a close fringe of slender yellowish hairs on the dorsal crest of the carpus, manus, and dactylus of the chelipeds, and transverse fringes at the joints; the merus has two hairy lines forming a V-shaped figure on its upper surface; on the inner surface of the manus there is a Y-shaped arrangement of long hairs, and a dense distal tuft on the thumb; the ambulatory legs have a dorsal fringe of hairs and also transverse ones at the joints. The under side of the carapace and the outer maxillipeds are also covered with long yellow hairs.

Measurements.

No.	Sex	Carapace		Ratio	Chelæ		Locality
		length	breadth		length	height	
4050	♀	32	33	1:1.03	16.5	12.5	Bermuda
1424a	♂	35	36.5	1:1.04	26	21	C. St. Lucas (typical)
1424b	♀	36	37.5	1:1.04	26.5	21.5	“ “ “

Our form is so very similar to *C. Bairdii* of the Pacific coast that it can hardly be separated as a species. I have been able to compare it carefully with specimens from Panama and with two specimens,* male and female, from Stimpson's type-locality (Cape St. Lucas, coll. Xantus, Yale Mus.). The latter are, however, larger than our best Bermuda specimen, which is an immature female. The Bermuda

* See plate xxvii, figure 2, photo. from one of these.

form has the carapace more strongly areolated and appears rougher, owing to the relatively larger granules and more elevated tubercles. The two frontal teeth are more acute and have a small lobe or shoulder on the outer edge, while those of *C. Bairdii* are obtuse at tips and have no lobe. The carapace has the posterior lateral spines sharper, longer, and farther back, in the Atlantic form, and the sides are more rapidly contracted behind the spines; the crests of the chelæ are higher and the edge more convex, the third tooth from the front being longest, while in typical *C. Bairdii* the second is longest. These teeth in the former are angular or carinate on the front side, while in the latter they are evenly convex; they are granulated in both. The outer surface of the chelæ has fewer but larger tubercles in the Atlantic form, and the lower edge is bevelled

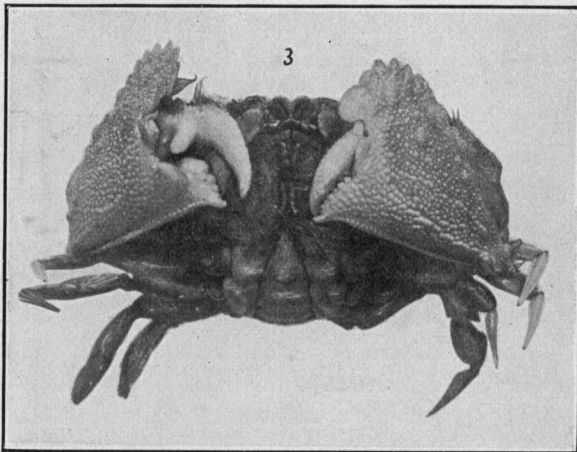


Figure 47.—*Cycloes Bairdii*, var. *atlantica*, from Bermuda, under side, \times about $1\frac{1}{4}$. Phot. A. H. V.

and has two rows of small rounded granule-like denticles, while in *O. Bairdii* it is flatter, with two rows of larger obtuse denticles. The large tooth, near the lower proximal end, is acute-triangular in *O. Bairdii*; broadly rounded and obtuse in the Atlantic form.

There are various other minor differences, but whether they are constant or not is uncertain, on account of the small number of Atlantic specimens available for comparison. I have not been able to compare the male appendages.

There is much difference in the abdomen, but this is evidently largely due to the immaturity of the smaller specimen.

Two specimens of this species were taken in shallow water, in a sandy cove of Castle Harbor, near Walsingham Bay, in March, 1901 (coll. A. H. Verrill, Yale Mus.). Cast-off shells were found elsewhere, of larger size. Bahamas, six fathoms, and Porto Rico (Rathbun).

The Pacific form ranges from the Gulf of California to Panama. Cape St. Lucas (Stimpson, coll. Xantus, Yale Mus.). Panama (Capt. V. Dow, Yale Mus.).

HAPALOCARCINIDEA, nov.

The position of the family *Hapalocarcinidae* in the system seems to be decidedly doubtful. Stimpson thought his genus was most nearly related to the Grapsoids.

Heller placed his genus, *Cryptochirus*, next to the *Pinnotheridae*. Miss Rathbun (Crust. Haw. Is., 1906) placed the family at the end of the *Oxystomata*, in proximity to the *Dorippidae* (*Ethusa*, etc.), to some of which there is considerable resemblance.

On the whole, it seems to me best to consider it as constituting a peculiar superfamily group, in which the genera are highly specialized, so as to adapt them to the peculiar habit of living in cavities, dens, or galls in the living parts of corals.

Each species hitherto discovered appears to represent a distinct genus, the genera differing among themselves widely in structure.

In general form and habits they superficially resemble some of the *Anomura*, especially the females, which have a large, elongated abdomen, in the form of a pouch, with all the sutures distinct, but not capable of curling up closely beneath the thorax, but there are no appendages on the sixth segment. The abdomen of the males is narrow and is applied closely to the sternum, as in ordinary Brachyura.

The epistome is feebly developed; the buccal area is large and arched anteriorly. The lower border of the orbit is little developed. The outer antennæ are small and extraorbital. The antennules have a large, prominent basal joint. The carapace is narrow and more or less oblong, or semicylindrical, not much narrowed anteriorly. The front is usually subtruncate or emarginate without a central tooth.

The outer maxillipeds are separated at base by a sternal lobe; they have the ischium broad, often with a convex inner lobe; the merus is small, seated well back, with the palpus articulated in a notch of the inner edge; the exognath is small.

The chelipeds are feeble, often little if any larger than the next legs; the chelæ are simple, with acute tips. The ambulatory legs

are all similar, short, with short, sharp, hooked claws, for strong adhesion. The posterior ones are not articulated much higher up than the others.

Family **HAPALOCARCINIDÆ.**

Troglocarcinus, gen. nov.

This generic name is proposed for a curious crustacean that inhabits holes and dens in the growing surface of living corals.

It is evidently closely related to the *Hapalocarcinus marsupialis* Stimpson of the Hawaiian Islands, which occupies gall-like nests between the living branches of *Pocillopora*. As in the latter, the abdomen of the female forms a capacious egg-pouch.

It differs in having the front of the carapace abruptly bent downward and operculum-like; in having the antero-lateral margin and front denticulate; in the form of the maxillipeds; and in several other characters. The eyes are not retractile; orbits feebly developed; a spine on the outer margin.

Troglocarcinus coralicola, sp. nov.

FIGURES 48, 49, *a, b, c.* PLATE XXVIII, FIGURE 8.

Carapace oblong, transversely convex; the sides nearly parallel posteriorly; front abruptly bent downward and covered with small, unequal, sharp spinules and hairs to which dirt, etc., firmly adheres; front edge minutely notched in the middle and finely spinulated; antero-lateral margin with a row of fine sharp spinules; upper surface, back of the frontal bend, hairy and granulated, the granules larger anteriorly and toward the sides; minute posteriorly. The sloping anterior part of the carapace has a concave area, each side of the median line. The antero-marginal spines decrease in size backward; the one at the exterior edge of the orbit is largest. The carapace is much higher or thicker in front, especially at the bend, than posteriorly. Sternum smooth, concave in the middle; genital openings of ♀ lunate, near together on the sternum.

Chelipeds small, in the female smaller than the first ambulatory legs; in the male about as stout, but not longer, hairy; chelæ small, with simple, acute digits. Ambulatory legs hairy, short, incurved, with simple, sharp, incurved claws; posterior legs becoming shorter, but similar to the others, articulated slightly higher up.

Eyes small on thick, short stalks; orbits looking forward. Pedicels of antennulæ large, longer than the eye-stalks, rather stout, near together, spinulose distally, with about three longer terminal spinules.

The antennules are small, folding vertically, the tips reaching but little beyond the eyes. Antennæ small, about as long as the eye-stalks. Outer maxillipeds have the merus short and broad, with a decided notch on the inner distal edge, at the articulation of palpus. The ischium is broader than long, with a rounded or semicircular lobe on its inner margin; exognath is small and short. The large palpi occupy about all the space to the bases of the antennules. The anterior lobe of the sternum separates the bases of the maxillipeds. Legs and maxillipeds very hairy.

The abdomen is convex and has the rings thin, but somewhat indurated above. In the female the edges are expanded and form a well developed egg-pouch below, containing eggs in two specimens.

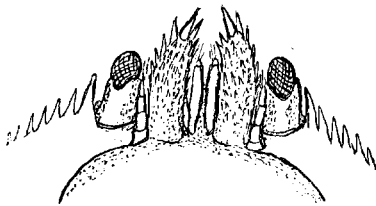


Figure 48.—*Troglocarcinus corallicola*, ♀, anterior parts, from below; diagrammatic sketch, much enlarged, from a Dominica specimen.

This curious species lives in oven-shaped cavities or dens formed in the upper surface of living corals, especially of *Mussa*, *Mæandra*, *Dichocenia*, etc.; as many as 8-12 such cavities are sometimes found in a coral six inches in diameter. The opening of the den is usually semicircular or lunate, commonly oblique to the surface of the coral; the opening being preserved, no doubt, by the friction due to the constant motions of the crab. The downturned, rough, and dirt-covered front of the crab serves as a lid or operculum, closing the aperture very nicely. The crabs can leave their dens, at least when young, as they often do so when the fresh corals are put aside to dry. The full grown crabs are probably unable to leave their dens.*

Length of carapace in one of the larger females, 7^{mm}; breadth, 4^{mm}. This one carries eggs.

It does not appear to be common at Bermuda. Abundant at Dominica I., in *Mussa* and *Mæandra clivosa*, from 3-5 fathoms (A. H. V., 1906, Yale Mus.).

* In the figure pl. xxviii, fig. 8, the crab was intentionally placed in a den too large for it, in order to show its form.