

The following description is from large Dominica specimens. The carapace is broad posteriorly, and much narrower in front of the deep transverse groove; the harder anterior portion is longer than broad, with the posterior margin truncate medially, in front of which there is an incised V-shaped groove, and some lateral oblique ones; front edge with three rounded lobes, the middle one more obtuse and less prominent than the others and obscured by hairs; a strong submarginal bent-bow-shaped groove; sides of carapace hairy; middle part nearly smooth. Posterior part of carapace with swollen, broadly expanded flanks, covered with oblique and divergent grooves; posterior margin deeply emarginate.

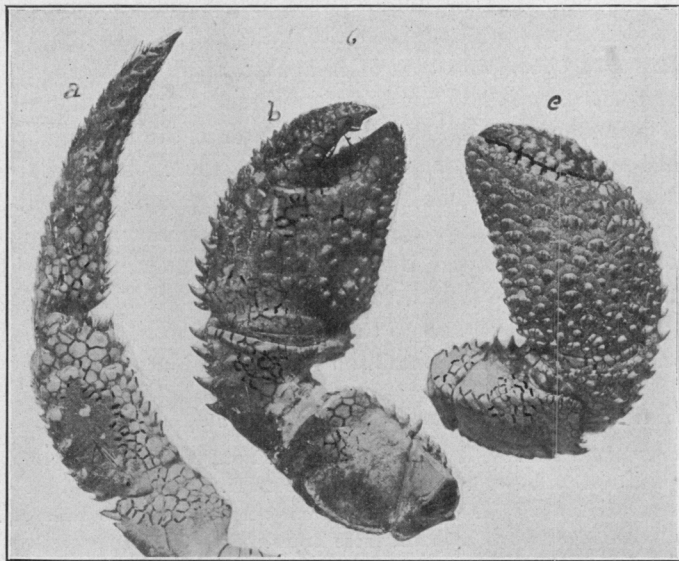


Figure 58.—*Dardanus venosus*; a, 2d ambulatory leg of left side, inner surface; b, the same, inner surface; c, left cheliped, outer surface;  $\times$  about  $1\frac{1}{2}$ . Phot. A. H. V.

The chelipeds are unequal, the left being decidedly larger, with the chela shorter, much more robust, and differently ornamented. The left cheliped has the merus triquetral, the two lower angles spinulose; the upper one serrate with flat teeth; the outer surface has slight rugæ and small tufts of hairs, otherwise the surface is smooth and glossy. The carpus is sharply spinulose above, five large acute spines stand on the upper edge; near the distal outer margin

the spinules are crowded in transverse rows, with close fan-shaped groups of yellowish plumose hairs arising from their outer bases. The manus is elegantly ornamented on the outer side with small, rounded, single and clustered tubercles, surrounded by regular stellate and fan-shaped groups of even plumose hairs that radiate horizontally from their bases, except on the proximal side, the tips of the adjacent groups of hairs mostly overlapping, so as to nearly cover the whole surface between the tubercles; toward the upper margin the tubercles become higher and more pointed or spiniform; those along the margin are acute spines, bent forward; on the thumb and dactyl the tubercles of each cluster blend together and form larger rounded tubercles, usually paler in color, but carrying plumose basal hairs; the thumb and dactyl each have, along the cutting edge, a row of five or six strong, rounded, paler teeth and are tipped with a narrow, subacute, but strong black nail or claw, excavate within.

The inner surface of the manus is rather smooth, with some scattered, unequal, rounded tubercles, especially on the lower half, and a regular row of larger ones along the lower margin. Many of these tubercles bear terminal clusters or pencils of slender hairs, especially those along the inner edges of the digits, where the pencils of hairs are larger and arise from pits. The dactyl is so articulated that it moves up and down in a nearly vertical plane.

The right chela is scarcely half as thick and more tapered. The tubercles of the outer surface are low or flattened, and bear comparatively few longer slender hairs, but those along the upper margin become acute spinules; on the inner surface the tubercles are flat or scarcely raised above the smooth surface, but have a central hair-bearing pit, and are marked out by the narrow red lines that surround most of the tubercles.

The left leg of the second ambulatory pair is very characteristic in its armature and ornamentation. The two distal segments are triquetral, owing to a strong carina that runs along the middle of the outer side, above which there is a wide and deep sulcus. This carina, on the propodus, carries, on its upper and outer surfaces, about ten or eleven oblique transverse rows of small appressed tubercles, arising from ridges, and decreasing in size downward; the proximal rows have six to eight, but the distal ones have only one or two tubercles; from the basal ridges arise crowded rows of short, appressed, plumose hairs, which cover the intervening spaces. On the dactylus the transverse ridges are shorter but more prominent

and the rows of tubercles decrease from about three, proximally, to one or two distally; the ridges bear on the distal side plumose hairs, as on the propodus. The lower marginal carina bears one or two upper rows of subacute or conical tubercles, and an under row of larger, white, obtuse tubercles, with a pit bearing a pencil of long hairs, while the upper ones bear basal, plumose, appressed hairs. The distal articular margin is also fringed with long hairs. The upper outer surface also bears transverse rows of conical tubercles on raised ridges, carrying short plumose hairs on the distal side, as below; on the propodus there may be three or four tubercles in a row, but on the dactyl there are but two or three, or only one distally, and the hairs are longer.

On the upper surface of the propodus there are two or three rows of large, mostly acute, often double, hair-bearing tubercles, with pencils of hairs arising from pits; on the dactyl these tubercles become broader, truncate, or even concave, with clusters of numerous pits from which pencils of longer and stouter hairs arise. The terminal claw is short and black.

The second ambulatory leg of the right side, as mentioned by Stimpson, is also flattened, though less so than the left, and has near the margins of the propodus, above and below, flattened, transverse tubercles, which bear rows of small appressed hairs on the distal edge, becoming longer at the margins; similar, but smaller flat tubercles are scattered on the middle portion, but there is no median carina.

The other ambulatory legs are more slender, and covered with appressed tubercles, bearing pencils of long hairs. The legs of the third pair have rather stout chelæ, and are very hairy.

The eye-stalks are stout, somewhat enlarged distally, with large black eyes; they are shorter than the width of the anterior part of the carapace; they bear scattered pencils of slender hairs.

The ocular scales are about as broad as long, well separated, with the outer end three-toothed, the inner tooth longest, minutely denticulate and fringed with hairs.

The aciculum of the antenna is long, slender, acute, and very hairy. The antennulæ are much longer than the eye-stalks, which reach to about the middle of the last joint of the peduncle.

Specimens of large size, when recently dried, have the legs and chelipeds light orange, varying to red on the exposed surfaces, with the tubercles of the chelæ crimson or purple; those surfaces less exposed in life are paler orange or yellowish; under a lens the surfaces

of the chelipeds and legs are seen to be covered with a reticulation of narrow, bright red lines, which generally, also, surround and mark out the paler colored tubercles and spinules, but they may also form a network of small polygons on the smooth surfaces. When the chela and tubercles are red, as in some of the larger specimens, these lines become dark red, but are less conspicuous, especially on the outer surface, where the appressed hairs between the tubercles conceal them.

The ambulatory legs are usually crossed by three or four wide, rather conspicuous bands of red, one on each segment, or the red color may sometimes predominate, and then the bands are yellow or orange, on a red ground-color.

A specimen of medium size, from Dominica, has the carapace 31<sup>mm</sup> long; anterior portion, 13<sup>mm</sup>; breadth of anterior part, 12.5<sup>mm</sup>; of posterior part, 26<sup>mm</sup>; length of eye-stalks, 8<sup>mm</sup>; length of larger chela 22<sup>mm</sup>; height, 13<sup>mm</sup>; length of right chela, 13<sup>mm</sup>; height, 8<sup>mm</sup>; propodus of 2d left ambulatory leg, 13<sup>mm</sup> long; 7.5<sup>mm</sup> wide; dactylus, 20<sup>mm</sup> long; 5<sup>mm</sup> wide at base.

A larger specimen has the left chela, 25<sup>mm</sup> long; 15<sup>mm</sup> high; 10<sup>mm</sup> thick; palm above, 13<sup>mm</sup>; dactylus, 13<sup>mm</sup>.

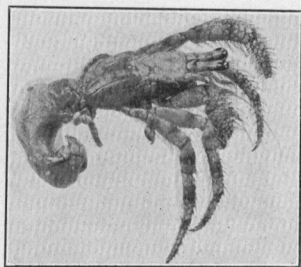


Figure 59.—*Dardanus venosus*. Young, from Bermuda, about  $\frac{1}{3}$  nat. size.

The carapace of a small specimen preserved for a short time in formol is pale yellow, with a bright purple median area anteriorly, and a branchial patch of the same on each side, and bands of the same color at the bases of the legs and on the middle of the eye-stalks. The chelipeds are orange, finely reticulated with bright red lines, the reticulations enclosing the whitish tubercles. The second leg on the left side is larger and has on its outer side a median row of bright purple rounded tubercles on the two distal segments, and an outer sublateral row of smaller ones of the same color; the four distal segments of the legs have each a wide band of dark red.

The left chelipeds and second ambulatory leg are covered with fan-shaped groups of plumose hairs, mostly dark red, but some are whitish. Tips of the digits black and spoon-shaped. The left chela is the larger, compressed, and covered with coarse granules. This is from Bermuda, fig. 59.

This species appears to be rare in Bermuda. We obtained one specimen in 1898; another in the Yale Museum was collected by Dr. F. V. Hamlin about 1877. Its range is from Florida to Brazil, Porto Rico (Benedict as *insignis*); ? Maceio and Rio Goyanna, Brazil, on reefs (Rathbun as *insignis*).

About a dozen good specimens of this conspicuously colored species were obtained at Dominica Island by A. H. Verrill, in 1906 (Yale Mus.). They were taken in baited fish-traps in 10 to 25 fathoms. They occupied shells of *Triton variegatus*, *Murex*, and half-grown *Strombus gigas*.

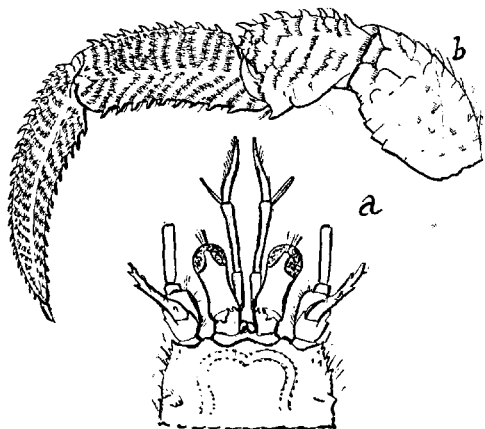


Figure 60.—*Dardanus insignis*; a, anterior part of carapace and appendages enlarged; b, distal part of 2d ambulatory leg of left side, more enlarged. After Saussure. See also pl. xxvi.

This species is pretty closely allied to *D. insignis*, but is easily distinguished by the armature of the chelæ and second left ambulatory leg. The eye-stalks of the latter are also shorter (see fig. 59), not reaching to the end of the antennal aciculum, and the ocular scales are different in form. In *D. insignis* the second left ambulatory leg has no median carina on the outer surface (see fig. 59, and Plate xxvi, 4, 5), the oblique ridges and long rows of small tubercles curve backward and meet in "herring-bone" fashion along the convex middle line, on the propodus, but are interrupted by a groove on the dactylus; they are armed with appressed plumose hairs, as in *D. venosus*.

But, unlike the latter, this has also many short, curved, or convex ridges on the carpus and distal part of the merus externally, similarly furnished with appressed hairs; other similar, curved ridges are on the inner surface of the propodus and dactylus, above and below.

It is also more yellow in color and more uniform, without conspicuous bands of red on the legs, and without the red reticulated lines.

Two large specimens of *D. insignis* obtained at Dominica I., in 1906, by A. H. Verrill, are in the Yale Museum. They occupy shells of *Triton variegatus*.

They were taken in fish-traps, in 10 to 25 fathoms, associated with *D. venosus*. The latter was much more common. Saussure's type was from Guadeloupe.

**Clibanarius tricolor** (Gibbes) Stimp. *Tricolored Hermit-Crab. Blue Hermit-Crab.*

*Pagurus tricolor* Gibbes, Proc. Amer. Assoc. Adv. Sci., iii, p. 189, 1850.

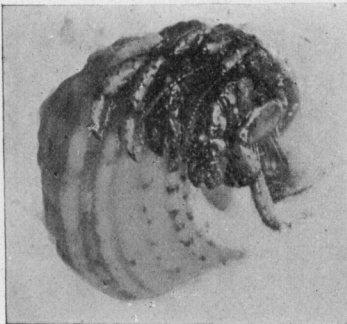
*Clibanarius tricolor* Stimpson, Proc. Acad. Nat. Sci., Philad., p. 234 [72], 1858. Rankin, op. cit., p. 239, 1900 (Bahamas); vol. xii, p. 535 (Bermuda).

Benedict, Anom. Crust. Porto Rico, p. 142, pl. vi, fig. 2, 1901 (descr.).

FIGURES 61, 62, 63.

This is a small and very abundant species easily distinguished from all others by its remarkable coloration, in which blue predominates.

61



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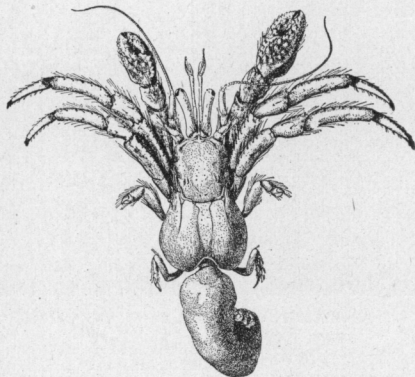


Figure 61.—*Clibanarius tricolor* in a shell of *Modulus*,  $\times$  about 4 times. Phot. A. H. V.

Figure 62.—The same, much enlarged, after Benedict.

The carapace and eye-stalks are generally bright blue; the antennæ are annulated with bright orange; chelipeds dark olive-green and brown, irregularly spotted with blue, orange, and white; the chelæ