The Fauna and Geography
of the
Maldive and Laccadive Archipelagoes

Being the Account of the Work carried on and
of the Collections made by an Expedition
during the years 1899 and 1900

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CONTENTS OF VOL. II. PART I.

Reports.

MARINE CRUSTACEANS.

IX. THE SPONGE-CRABS (DROMIACEA).

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(With Plate XXXIII.)

The members of the Dromiacea are separated from the other groups of Brachyura by a number of characters, most of which are primitive and show that they are nearer than the rest of the Crabs to the macrurous ancestors from which the tribe arose. The most important of these features are: the presence of a pair of vestigial limbs on the first abdominal segment of the female, and often on the sixth in both sexes[1], the epipodites, which are often found on one or more of the pairs of legs, the number of gills, which is usually large, the more or less square shape of the mouth, the large, usually free, basal joint of the antennal stalk, and the often incomplete orbits. To these must be added a highly characteristic, but not primitive, feature—the small size, dorsal position, and usually prehensile shape of one or both of the hinder pairs of legs (Pl. XXXIII).

This conformation of the hinder legs is connected with the most characteristic peculiarity in the habits of the Dromiacea. Most of them are in the habit of holding over their backs masses of some sessile animal—usually a sponge, but at times an ascidian, an alcyonarian, or even half a bivalve shell, on which a sea-anemone is often seated—by means of which they are completely hidden[2].

The most important part of the prehensile apparatus by which this is accomplished is the last joint of the legs of the hinder two pairs. This joint is sharp and hooked in most genera, and is buried deeply in the substance of the sponge. There is often also a thorn on the propodite, which makes with the last joint a more or less perfect chela (Pl. XXXIII, figs. 3 *b*, 4 *b*). In many cases, at least, the crab does not confine its choice to one species of sponge. Whether the latter is at first merely a fragment broken off from a larger mass, or is always a whole colony, perhaps specially adapted to this life and not found elsewhere, is not known, but in any case the initiative in forming the partnership must come from

[1] Bouvier (*Bull. Soc. Philomath.* Paris, 1896) throws doubt on the correctness of the view which homologises the structures on this segment in Dromiidae with the last pair of limbs of Macrura.

[2] This curious habit is also found in the Dorippidae among the Oxystomata (see above, p. 435, vol. I.).

the crab, for the sponge is quite free, and is merely held in position by its host. On the other hand, it must live thus for some time, and grow meanwhile, for it will always be found to have a deep hollow on the underside, closely fitting the back of the crab. No doubt this helps to keep it from slipping, as does also, perhaps, the hairy or woolly coat with which the decapod is usually provided. The hairs of this coat are often very diverse and complicated in shape—pointed or clubbed, feathered or simple (Pl. XXXIII, figs. 1 *b*—*d*, 3*c*—*f*[1])—though it is hard to see what end these can serve.

Of the two groups into which the Dromiacea are subdivided, the Homolidea are principally deep-water forms, and were not met with by the expedition. The Dromiidea, on the other hand, are fairly common on the reef, where they are to be found in all possible positions, holding on tightly with the sharp tips of their very mobile walking-legs (Pl. XXXIII). In their habits they are slow and heavy, trusting rather to concealment than to active avoidance and defence.

In the systematy of the Dromiidea much use is made of the *sternal grooves* of the female. These are a pair of furrows, one on each side, which run longitudinally over the thoracic sternites of the female, beginning on the hindermost and ending on that which corresponds to the first, second, or third pair of legs. Their forward ends may be raised on knobs, and are either wide apart, side by side but not meeting, or curving round to meet. They correspond closely with the position in which the long abdominal limbs of the male are carried, and are therefore probably used for some sexual purpose. Other features of systematic importance in this group are: the presence or absence of epipodites, the proportions of the body and the extent to which furrows are present on the back, dividing it into regions, the shape and relative length of the legs, etc. For specific distinctions, the shape, number and arrangement of the teeth on the front, anterolateral edge, underside of the body, and legs are chiefly used.

The following keys, introduced here in performance of the promise given in the article on the classification of the crabs (p. 426 above), will enable members of the legions and families of the Dromiacea to be recognised:

Key to the legions of the Dromiacea.

I. Sternum of female with longitudinal grooves. Vestiges of 6th pair of abdominal limbs usually present. Gills 14—20 on each side. Eyes usually completely sheltered by orbits when retracted. No *lineae anomuricae*. *Dromiidea.*

II. Sternum of female without longitudinal grooves. No vestiges of 6th pair of abdominal limbs. Gills 8—14 on each side. Eyes incompletely or not at all sheltered by orbits when withdrawn against the body. *Lineae anomuricae* usually present. *Homolidea.*

Key to the families of the Dromiidea.

I. No vestige of 6th abdominal limb. Carapace longer than broad, with ill-marked side edge. [First three legs with epipodites, fourth and fifth small, subdorsal, and prehensile.] *Homolodromiidae.*

[1] For the investigation of this interesting point I am indebted to Mr Edwin Wilson's enthusiasm for the subject.

II. A vestige of the 6th abdominal limb present [except in *Hypoconcha*, where also no epipodites]. Carapace usually not longer than broad, with well-marked side edge.

A. An epipodite on the first leg (cheliped) only or on none. Fourth and fifth legs small, subdorsal, and usually prehensile. *Dromiidae.*

B. Epipodites on all the first three pairs of legs. Fifth leg only small and subdorsal. *Dynomenidae.*

Key to the families of the Homolidea.

I. Gills 13 or 14 on each side. Epipodites on first one or three pairs of legs. First joint of eyestalk not much longer than second. *Homolidae.*

II. Gills 8 on each side. Epipodites not found on any legs. First joint of eyestalk much longer than second. *Latreillidae.*

Of the seven species in the present collection three are new, and all the remainder are already recorded from the Indian region. Many of the specimens bear sponges, but, as the species of these have not been determined, no further allusion will be made to them.

Family **Dromiidae.**

Generic names in this family are used here in the sense in which they have lately been defined by the writer (*Ann. Mag. Nat. Hist.* (7) XI. p. 298).

Genus *Dromia* Fabr., 1798.

1. *Dromia rumphi* Fabr., 1798 (Pl. XXXIII, fig. 1). Alcock, v. p. 137.

In young specimens, such as the one figured on Pl. XXXIII, there is a distinct tooth at the inner orbital angle, and the teeth on the wrist are also much sharper. The species was dredged in Haddumati Atoll in 40 fathoms.

Genus *Dromidiopsis* Borradaile, 1900.

2. *Dromidiopsis australiensis* (Hasw.), 1882.

Dromia (*Dromidia*) *australiensis*, Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.* I. i. p. 76 (1901).

Var. *bidens* n. Specimens of the variety described by de Man [*Zool. Jahrb. Syst.* IX. p. 372], with only *two* of the three teeth behind the orbital angle in the type, were taken in the Maldives. I propose to name this variety *bidens*. A specimen from Fiji in the Cambridge Museum belongs to the same variety, but there is another Rotuman specimen, and one from Fiji, which have only *one* of the three side teeth remaining. This I propose to call var. *unidens*.

Taken on the reef at Hulule, Male Atoll, and dredged in 25 fathoms in South Nilandu Atoll.

3. *Dromidiopsis tridentatus* n. sp. (Pl. XXXIII, fig. 2).

Diagnosis: "A *Dromidiopsis* whose carapace is slightly longer than broad; the body and limbs smooth, covered with a fine down; the front triangular with the tip just visible from above, deeply grooved and with low swellings of the sides to form a pair of indistinct teeth; no trace of a tooth at the upper, inner orbital angle, the outer orbital angle strong,

but not forming a tooth, a deep cleft on the orbital edge just below the outer orbital angle; three small blunt knobs on the anterolateral edge behind the outer orbital angle, two broad notches behind these teeth corresponding to the branchial groove (which is present) and probably to the cervical groove (which is absent); the 2nd and 3rd legs with strong, hooked end-joints, armed with a few thorns underneath, the fourth leg short, subchelate, and the fifth leg as long as the third, also subchelate."

Length: 11 mm. Breadth: 10 mm. Colour in spirit: pale yellow.

One female from Hulule, Male Atoll.

This species much resembles *Dromidiopsis australiensis*, but may be distinguished by the more distant and more outstanding teeth of the anterolateral edge, which in *D. australiensis* are broader at their base, by the sternal grooves of the female, which meet and end on the segment of the first walking-leg, and by the presence of a spine on the *hinder* edge of the propodite of the fifth leg. The cheliped has an epipodite.

Genus *Dromides* Borradaile, 1903.

For a diagnosis of this genus see the paper cited on p. 576 above.

4. *Dromides hilgendorfi* (de Man), 1887. Alcock, v. p. 145[1].

Dredged in Suvadiva and South Nilandu Atolls, in 30 and 19 fathoms respectively.

Genus *Cryptodromia* Stimps., 1858.

5. *Cryptodromia bullifera* Alc., 1898. Alcock, v. p. 143.

Dredged in South Nilandu Atoll in 30 fathoms.

6. *Cryptodromia hirsuta* n. sp. (Pl. XXXIII, fig. 3).

Diagnosis: "A *Cryptodromia* with the body broader than long, smooth and hairy, the regions indistinct; the front prominent and bearing three fairly sharp teeth, of which the middle one is somewhat longer than those at the sides; the upper rim of the orbit finely beaded and bearing a tooth near its inner end, a tooth at the outer and another at the lower inner orbital angle; one tooth on the anterolateral edge and a low swelling behind this tooth, a small blunt tooth behind the branchial groove, and a strong conical subhepatic tooth; the carpopodite and propodite of the cheliped and second two pairs of legs knobbed, but without sharp thorns, and the last two pairs of legs short, subequal, and feebly chelate."

Length: 7 mm. Breadth: 8 mm. Colour in spirit: dull yellow, legs often orange.

The sternal grooves of the female end widely apart on the line between the sternites of the first and second walking-legs. There is no epipodite on the cheliped.

Taken on the reef in Minikoi and Male Atolls.

[1] For the principle on which references are given in this series of papers see above, Pt. I. p. 192. Alcock's paper on Indian Dromiacea here referred to appeared in *Journ. As. Soc. Bengal*, LXVIII. ii. (1899).

Genus *Cryptodromiopsis* Borradaile, 1903.

For a diagnosis of this genus see the paper cited on p. 576 above.

7. *Cryptodromiopsis tridens* n. sp. (Pl. XXXIII, fig. 4).

Diagnosis: "A *Cryptodromiopsis* with the body broader than long, smooth and hairy, the grooves between the regions almost wholly lost, a smooth, naked, oval boss on each side of the cardiac region: the three teeth of the front of almost equal length and all sharp; teeth at the upper and lower inner, and at the outer orbital angles; two anterolateral teeth but no tooth at the branchial groove; a subhepatic tooth and a prominent angle of the mouth; the fingers of the chelipeds gaping and two blunt teeth on the wrist; a thorn at the end of the carpopodite in the first two pairs of walking-legs, and another at the end of the propodite in the last two pairs, making with the end-joint a strong chela."

Length: 6 mm. Breadth: 8 mm. Colour in spirit: dull yellow.

There is no epipodite on the cheliped, and the sternal grooves of the female end side by side on the cheliped segment without actually meeting.

Taken on the reef in Male and Minikoi Atolls.

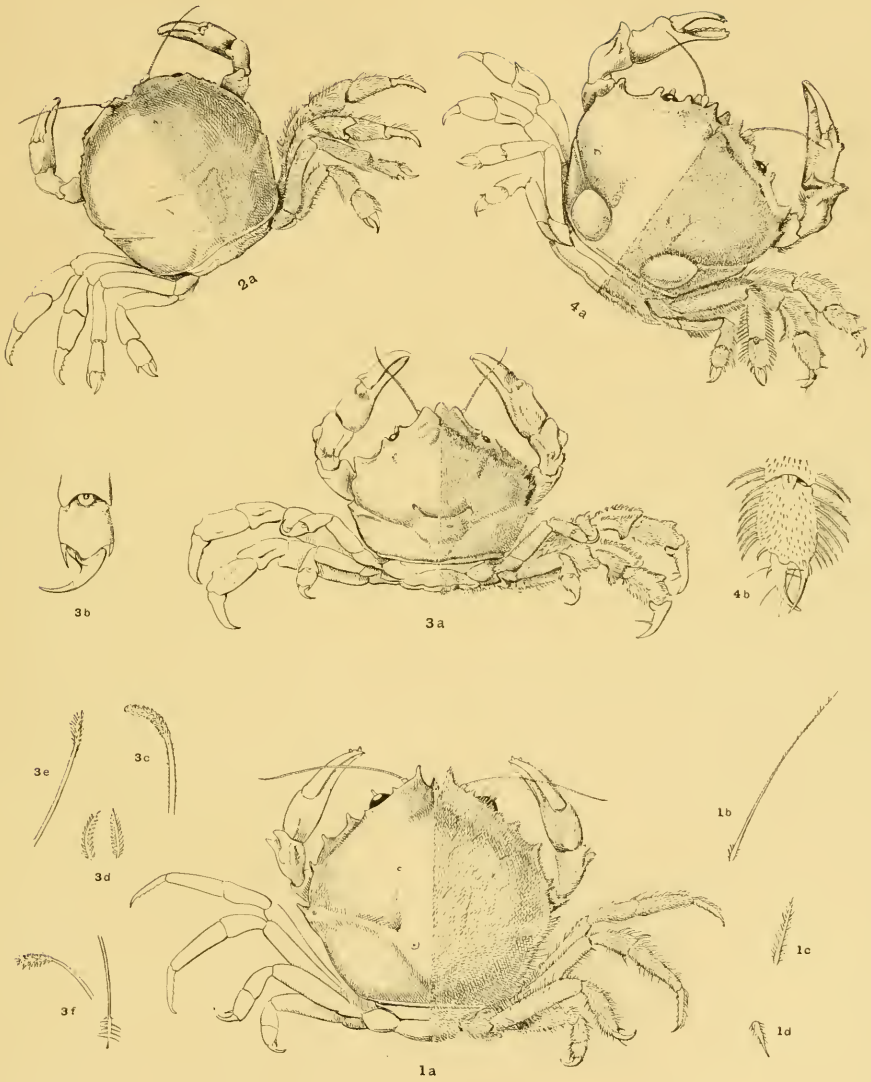
EXPLANATION OF PLATE XXXIII.

Fig. 1. *Dromia rumphi*, young individual; *a.* whole animal, *b.* one of the long hairs on the back; *c*, *d.* short hairs on the back.

Fig. 2. *Dromidiopsis tridentatus*; *a.* whole animal, from above. The carapace is rather longer than is shown in the figure.

Fig. 3. *Cryptodromia hirsuta*; *a.* whole animal, *b.* end of the fifth leg, *c.* one of the hairs on the ridge overhanging the furrow just behind the front, *d.* small hairs on the back, *e.* long hair on the back, *f.* hairs on the legs.

Fig. 4. *Cryptodromiopsis tridens*; *a.* whole animal, *b.* end of the fifth leg.



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BORRADAILE—DROMIACEA.

To face p. 578.