

XXXIX.—*Description of a new Species of Balanus from the Collection of the British Museum.* By Prof. A. GRUVEL.

Balanus violaceus, sp. n.

Diagnosis.—Walls and base porous. Radii well developed, not pierced by pores. Test violaceous in general colour, with numerous narrow, longitudinal, clear grey-blue ribs. Base entirely porous. Scuta with the articular ridge very prominent, the ridge of the adductor feebly developed and situated a little nearer the rostral than the tergal margin; pit for the adductor muscle deep; cavity for the lateral depressor muscle also deep. Terga with the ridge and the articular furrow very clearly marked; spur prominent at the rounded lower extremity, and situated at a slightly less distance than its own width from the basiscutal angle; crests for the depressor muscle very distinct and prominent; no external longitudinal furrow, but, on the contrary, a longitudinal ridge; apex slightly projecting, terminating in a blunt point.

Habitat. Unknown.

N.B.—This species comes near to *B. nubilus*, Darwin, and consequently its place is in section C.

XL.—*On the Genera of the Dromiidae.* By L. A. BORRADAILE, M.A., Lecturer in Natural Sciences at Selwyn College, Cambridge.

SINCE Bouvier's paper "Sur l'Origine homarienne des Crabes" (Bull. Soc. Philom. 1896) the limits of the genera of this family of primitive crabs have become very uncertain. In the list of genera and species of the Dromiacea which he has lately published* Alcock has included Stimpson's *Dromidia*, with *Dromia* as a subgenus, and placed *Dromidiopsis* † with *Dromidia* as synonymous, regarding *Cryptodromia*, Stimps., as still an independent genus. In working out the collection of Dromiidae made by the late Maldive Expedition I have been led to conclusions which differ from these with regard to the genera *Dromidia* and *Dromidiopsis* and support the view hitherto held of their generic distinctness. Moreover, it has seemed that certain other rearrangements are

* 'Catalogue of the Indian Decapod Crustacea in the Collection of the Indian Museum,' part i. fascic. 1, pp. 74-80 (1901).

† Borradaile, P. Z. S. 1900, p. 572.

necessary and that a new genus must be established for one of the new Maldive species. In these circumstances a settlement of the question may be forwarded by the following short survey of its position, in the shape of a redefinition of the central group of genera and a key which includes them with the others of the family.

The definition of each of the revised genera is followed by a list of those species which I am at present able to assign to it. References to all of these which have been already described will be found in Alcock's work cited in the footnote. The new species will be described in the 'Fauna and Geography of the Maldive Islands,' vol. ii. part 1.

The features of which I have made use for systematic purposes are for the most part those taken by other writers. The principal are:—The presence or absence of an epipodite on the first leg (cheliped), the distinctness or otherwise of the furrows on the back which mark off the regions, the proportion of the length of the carapace in the middle line to its greatest breadth, the shape of the legs, and the arrangement of the sternal furrows. These are a pair of grooves, one on each side, which run fore and aft over the thoracic sternites of the female, beginning on the hindmost 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 to meet.

Definitions of Genera of Dromiidae.

1. DROMIA, Fabr.

"Dromiidae with an epipodite on the cheliped, the walking-legs not knobbed or ridged, the carapace broader than long, the regions well marked or indistinct, the ridges of the efferent branchial channels broken, indistinct, or well made, the sternal grooves of the female ending apart behind the cheliped segment, the fifth leg shorter than the third and with no thorn on the outer side of its last joint."

D. vulgaris, *D. dormia* (= *D. Rumphii*), &c.

2. DROMIDIOPSIS, Borradaile.

"Dromiidae with an epipodite on the cheliped, the walking-legs not knobbed or ridged, the carapace longer than broad, the furrows between the regions almost completely lost, the ridges of the efferent branchial channels well made, the sternal grooves of the female ending together on the cheliped segment or on that of the first walking-leg, the fifth leg

about as long as the third and often with a thorn on the outer side of its last joint."

D. australiensis, *D. tridentatus*, sp. n., *D. cranioides*, *D. orientalis*, ? *D. caput-mortuum*, &c.

3. DROMIDIA, Stimps. (? + *Pseudodromia*, Stimps.).

"Dromiidae with no epipodite on the cheliped, the walking-legs not knobbed or ridged, the carapace narrow but not longer than broad, the furrows between the regions almost completely lost, the ridges of the efferent branchial channels well made, the sternal grooves of the female ending together usually on the segment of the cheliped, the fifth leg longer than the fourth, as long as or rather shorter than the third, and with no thorn on the outer side of its last joint."

D. hirtissima (probably), *D. antillensis*, *D. unidentata*, &c.*.

4. DROMIDES, gen. nov.

"Dromiidae with no epipodite on the cheliped, the walking-legs not knobbed or ridged, the carapace longer than broad, the furrows between the regions almost completely lost, the ridges of the efferent branchial channels well made, the sternal grooves of the female ending apart in the fore part of the segment of the second walking-leg, the fifth leg shorter than the third and with no thorn on the outer side of its last joint."

D. Hilgendorfi, &c.

5. CRYPTODROMIA, Stimps. (+ *Epidromia*, Kossm.).

"Dromiidae with no epipodite on the cheliped, the walking-legs knobbed or ridged, the carapace usually broader than long, the regions present and usually well defined, the ridges of the efferent branchial channels well made, the sternal grooves of the female ending apart behind the cheliped segment, the fifth leg shorter than the third, and its last joint without a thorn on the outer side."

C. coronata (probably), *C. pileifera*, *C. canaliculata*, *C. bullifera*, *C. Demani*, *C. ebaloides*, *C. Gilesi*, *C. granulata*, *C. hirsuta*, sp. n., &c.

6. CRYPTODROMIOPSIS, gen. nov.

"Dromiidae with no epipodite on the cheliped, the walking-legs knobbed or ridged, the carapace broader than long,

* The species known as *Dromidia globosa* (Lam.) seems to me to belong to *Cryptodromia*. The question can only be settled by an examination of the sternal grooves of the female, which appears to be unknown.

especially broad in the forepart, and with the furrows between the regions almost completely lost, the ridges of the efferent branchial channels well made, the sternal grooves of the female ending together on the cheliped segment, the fifth leg shorter than the third, and a spine on the outer side of its last joint."

C. tridens, sp. n., &c.

7. PETALOMERA, Stimps.

"Dromiidæ with an epipodite on the cheliped, the walking-legs bearing sharp ridges, the carapace varying in the relation of its length to its breadth, but usually broader than long, the regions clearly or indistinctly marked, the efferent branchial channels well made, the sternal grooves of the female ending apart behind the cheliped segment, the fifth leg shorter than the third, and without a thorn on the outer side of its last joint."

P. granulata, *P. pulchra*, *P. indica*, *P. lateralis* *, &c.

It is as yet impossible to assign most of the species hitherto placed under *Dromia*, *Dromidia*, and *Cryptodromia* to any of the genera above defined, owing to lack of knowledge, especially with regard to the epipodites and sternal grooves. Making use of such information, direct or implied, as can be found in the works of former writers on the subject, as well as that given by my own examination of a number of specimens, I have placed all the species I could. Till further details be forthcoming it will probably be found convenient to keep the others where Alcock has placed them. No doubt later knowledge will also make it needful to drop several items in the diagnoses, so as to give room for species which clearly belong to some particular genus but infringe its definition in certain respects. Alteration may also have to be made in the naming of the two genera which I have called *Dromidia* and *Cryptodromia*. With regard to the type species which carry these names—*D. hirtissima* (Lam.) and *C. coronata*, Stimps.,—we are as yet in ignorance on the all-important question of the epipodites. It seems likely, however, from their other features that they resemble in this respect the species with which I have placed them.

* *Cryptodromia lateralis* has epipodites on the chelipeds. There is also a distinct tendency to the formation of sharp ridges on the walking-legs. I am inclined to think that this species should be placed between the immediate ancestor from which *Cryptodromia* and *Petalomera* arose and *Dromia* (see tree on p. 302). In any case, the epipodites forbid its being placed in *Cryptodromia*, and its differences from the species of *Petalomera* as originally defined do not seem generic.

The following key sets forth, in a more or less empirical way, the principal characters of the genera of Dromiidae* :—

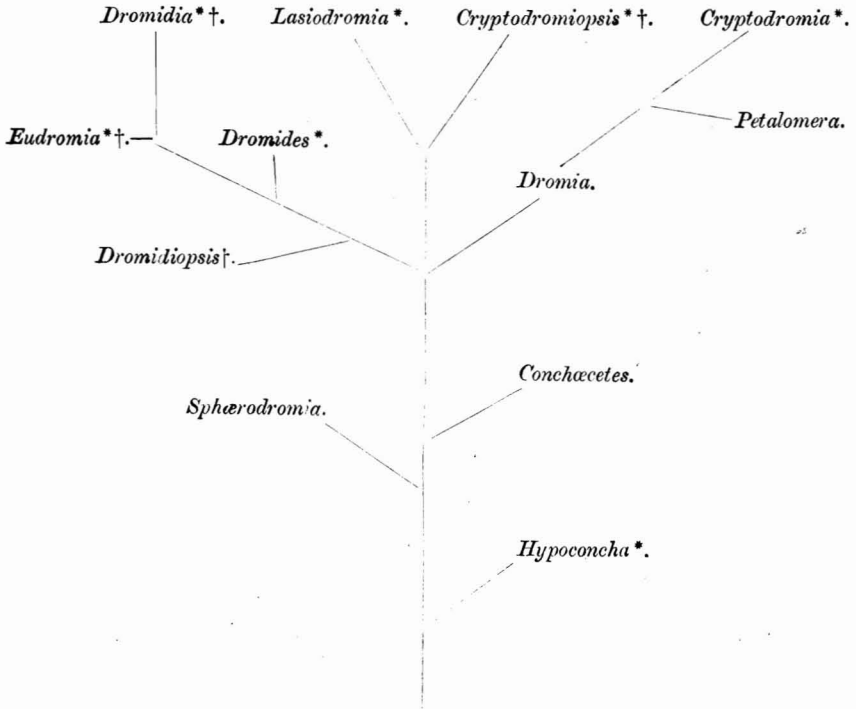
- I. No vestige of the sixth abdominal limb.
Last joint in legs of hinder two pairs has the shape of a half-moon, fastened by its outer side to the end of the leg. [No epipodite on the cheliped. Sternal grooves end apart on segment of second walking-leg. Carapace incompletely and more or less indistinctly divided into regions.] . . . *Hypoconcha*, Guér., 1854.
- II. A vestige of the sixth abdominal limb.
Last joint in legs of hinder two pairs has the shape of a hook, fastened at the blunt end to the leg.
 - A. Sternal grooves not reaching level of genital opening. Front triangular, notched in the middle. [Carapace subglobose, without regional grooves in the fore part. Epipodites?] *Sphaerodromia*, Alc., 1899.
 - B. Sternal grooves reaching level of genital opening. Front usually with a middle tooth and one on each side.
 - i. Fourth pair of legs shorter than third, but stout and ending in a very large hooked joint. Carapace flat. [Fifth leg slender. Epipodite on cheliped. Sternal grooves end apart.] *Conchæcetes*, Stimps., [1859.
 - ii. Fourth pair of legs not as in *Conchæcetes*. Carapace more or less swollen.
 - a. Front deeply cleft into two bifid lobes. [No epipodite on cheliped. Sternal grooves end apart on cheliped-segment.] *Lasiodromia*, Alc., 1901.
 - b. Front not as in *Lasiodromia*.
 - 1. Epipodites on the chelipeds.
 - a. Sternal grooves end together. Carapace longer than broad. Almost without regions. Usually a thorn on the outer side of the last joint of the fifth leg *Dromidiopsis*, Borradaile, [1900.
 - β. Sternal grooves end apart. Carapace usually broader than long. Regions more or less clearly marked. No thorn on the outer side of the last joint of the fifth leg.
 - (1) No ridges on the legs. Carapace not granular *Dromia*, Fabr., 1798.
 - (2) Ridges on the legs, some of

* For lack of information I am unable to include *Pseudodromia*, Stimps., 1859 (Proc. Ac. Philad. 1858, p. 226), or *Platydromia*, Fulton and Grant, 1902 (Proc. Roy. Soc. Victoria, 1902, p. 55). The first of these genera seems to be closely allied to *Dromiida*, and the second should perhaps be placed somewhere in the neighbourhood of *Cryptodromiopsis*.

On the Genera of the Dromiidae.

- which are sharp. Carapace more or less granular *Petalomera*, Stimps., 1859.
2. No epipodites on the chelipeds.
- a. Legs knobbed or ridged. Carapace broader than long.
- (1) Regions more or less clearly marked. Sternal grooves end apart. No thorn on hinder edge of last joint of fifth leg *Cryptodromia*, Stimps., 1859 (+ *Epidromia*, Kossm.).
- (2) Regions almost lost. Sternal grooves end together. A thorn on the hinder edge of the last joint of the fifth leg *Cryptodromiopsis*, g. n.
- β. Legs not knobbed or ridged. Carapace narrow, often longer than broad. [Furrows between the regions almost absolutely lost.]
- (1) Sternal grooves end together.
- (a) Front deeply cleft into two prominent rounded lobes. *Eudromia*, Hend., 1888.
- (b) Front not as in *Eudromia*. *Dromidia*, Stimps., 1859.
- (2) Sternal grooves end apart . . *Dromides*, g. n.

The probable genealogical relations between the genera may be represented by the following tree:—



In view of the great complexity of the subject and the small amount of information as yet available on several important points, it will easily be understood that the above arrangement only professes to be tentative*. It is given here not alone for its own interest, but because it shows very clearly a phenomenon often to be met with in the attempt to deal with problems of this kind. The group of genera on the right-hand branch have broad, usually well-regioned bodies †, and legs which are knobbed and ridged (except the walking-legs of *Dromia*). Those on the left-hand branch have simple legs and narrow bodies, almost without trace of regions. Now, the names followed by a star are those of genera which have lost the epipodites of their chelipeds, and it is easy to see that a division made on this feature would cross that made on the shape of the body and legs. Again, the genera after whose names a dagger stands are those in which the sternal grooves end together, so that by these grooves a third separation could be made. And, to take one more criterion, a thorn appears on the outer side of the last joint of the fifth leg in genera which, on other grounds, are separated as widely as *Dromidiopsis* and *Cryptodromiopsis*. Indeed, the whole tree is a good example of that kaleidoscopic shuffling of characters which so often meets the student of zoological genealogy, and whose interest lies in the suggestion that it makes of a tendency in the organization of the animals in which it is found to fall into certain types of structure somewhat reminiscent of the discontinuous variation of the Neo-Mendelians.

XLI.—On the Affinities and Nomenclature of certain Genera of Melolonthid and Rutelid Coleoptera. By GILBERT J. ARROW.

IN Gemminger and Harold's Catalogue of the Coleoptera the genus *Stethaspis* (in the Melolonthidæ) is represented by the single species *suturalis*, Fabr., of which *Micronyx chlorophyllus*, Boisd., and *Paranonca prasina*, Cast., figure as synonyms. Lacordaire expressed himself very doubtful of the correctness of the latter identification, and in 1873 *Paranonca* was referred by Lansberge to its right position with the

* This is especially the case with *Lasiodromia*, *Cryptodromiopsis*, and *Dromides*, whose position is extremely doubtful.

† With some exceptions it may be said that species belonging to genera on the right half of the diagram are broad, those on the left long.