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Publisher: Taylor & Francis

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Annals and Magazine of Natural History: Series 6

Publication details, including instructions
for authors and subscription information:

<http://www.tandfonline.com/loi/tnah12>

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Published online: 09 Oct 2009.

To cite this article: MM.A. Giard & J. Bonnier (1889) On an Epicaridan
parasitic on an Amphipod, and on a Copepod parasitic on an Epicaridan,
Annals and Magazine of Natural History: Series 6, 3:18, 512-514, DOI:
[10.1080/00222938909460381](http://dx.doi.org/10.1080/00222938909460381)

To link to this article: <http://dx.doi.org/10.1080/00222938909460381>

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MISCELLANEOUS.

On an Epicaridan parasitic on an Amphipod, and on a Copepod parasitic on an Epicaridan. By MM. A. GIARD and J. BONNIER.

HITHERTO no Epicaridan parasitic on Amphipods has been known. In September last Prof. Della Valle collected in the Bay of Naples two specimens of an Isopod parasitic upon *Ampelisca diadema*, A. Costa, and hastened to send them to us. These profoundly degraded Crustaceans belong to the group of the Cryptoniscians. They are adult females, one of them containing segmented ova, the other embryos ready to hatch and possessing the typical form of the first larva of the Cryptoniscians.

The whole body of the female is, so to speak, converted into a vast incubatory chamber, closed by two lateral laminæ extending from the first to the fifth thoracic segment, and united in the median line, in such a way as to leave apertures for the passage of water only at the anterior and at the posterior extremity.

On the dorsal surface may be distinguished five metameric bands representing the first five somites of the thorax. On each side of the body, behind the line of insertion of the incubatory plates, we see on each of the five segments conical eminences, probably vestiges of the first pairs of feet. The head, which is strongly inflexed in front, only presents rudiments of the ordinary appendages. The maxillipeds alone are considerably developed.

The terminal portion of the body from the sixth thoracic segment is also bent towards the ventral surface, so as to complete the incubatory chamber by a posterior cavity likewise filled with ova. The sixth and seventh thoracic segments bear each a pair of digitations representing the aborted appendages and protecting the posterior opening of the incubatory chamber. This aperture therefore much resembles that figured by Fraisse in *Cryptoniscus paguri*, Fr., but the margin of the lamellæ is simply thickened and does not terminate in chitinous ramifications.

The liver forms a gland faintly bilobed behind and of small size. It scarcely penetrates into the thoracic region. The digestive tube becomes dilated in the rectal part, to give origin to the ovoid organ characteristic of the Cryptoniscians. It terminates at an anus situated ventrally at the apex of the pleal mamilla, upon which traces of pleopoda may be distinguished.

This curious Epicaridan differs greatly from the genus *Cabirops*, Kossmann, which is parasitic upon the *Bopyri*; it more resembles *Cryptothiria* (?) *marcupialis*, G. O. Sars, parasitic on the Munnopsidæ (*Eurycope cornuta* and *Hyarachna longicornis*). But, like the latter, it must incontestably be taken as the type of a new genus. We shall give the name of *Podascon Della Vallei* to the parasite of *Ampelisca diadema*.

With the object of verifying the hypothesis formerly put forward by us with respect to the relationship of the Cryptoniscians and Dajidae, we have made an appeal to those zoologists who possessed specimens of these exceedingly rare Crustaceans. The Rev. A. M. Norman has kindly given us a specimen of *Dajus mysidis*, Kröyer, and lent us one of an *Aspidophryxus* *. We may notice here a most unexpected ethological fact—the existence of a Copepod parasitic on the latter. By a fortunate chance the specimen of *Aspidophryxus* communicated by Norman, which is attached to the back of an *Erythrops microphthalma*, G. O. Sars, sheltered beneath the posterior part of its slightly raised dorsal shield the female and two males of a very singular Copepod, which we shall name *Aspidocia Normani*.

The female presents the form of a sac resembling a miniature *Sacculina*; in its greatest diameter (transverse) it measures eight tenths of a millimetre. The colour in alcohol is rosy. The animal is attached on the one hand to the *Mysis* by a short peduncle terminated by a sucking-disk, on the other to the *Aspidophryxus* by an elongated cord (broken in our specimen) starting from the sucking-disk and inserted into the middle of the ventral surface of the pleon of the Epicaridan. Hooked on to this cord was the male *Aspidophryxus*, it being rendered impossible for him to shelter himself as usual beneath the pleon of his female. Towards the free extremity of the body of the *Aspidocia* two chitinous eminences are observed; then, on the side opposite to the sucking-disk, the two genital apertures, to which are appended *five* packets of ova. Each of these ovigerous sacs, which are nearly spherical in form and measure three tenths of a millimetre in diameter, contained eight or ten ova in segmentation.

In one of the sacs the ova were all very distinctly in the stage 4. The whole interior of the body of the female is filled with enormous ovaries containing well-developed ovules. We also observe, in the vicinity of the sucking-disk, two chitinogenous glands, which assist, no doubt, in the fixation of the parasite.

One of the males was attached to the *Mysis* at some distance from the female, the other upon the female herself. These males are about $150\ \mu$ in length. Their general form is very analogous to that of the males of *Spharonella Leuckarti*, Sal. In the anterior part the cement-glands secrete a spiral chitinous filament, which serves for the fixation of the animal. The presence of several filaments upon the integument of the female indicates either that the males move about or that they had been more numerous. Beneath the organ of adherence a broad sucking-disk enables the animal to apply its buccal parts to the host which supports it. As appendages, we find outside the mouth a pair of antennæ, a first pair of

* This specimen was named *A. peltatus*, G. O. Sars, but the authors regard it as belonging to a new species which they propose to name *A. Sarsi*.

rather feeble and a second pair of very robust maxillipeds, moved by very powerful striated muscles. The terminal portion of the body is obtuse and terminated by two lateral lobes, containing the sacs for the spermatophora. These organs, which are regularly spherical, are united with the testes by fine deferent ducts.

In the form of the female and in the multiplicity of the ovigerous sacs, which are so rare among the Copepoda, *Aspidæcia* closely approaches *Choniostoma mirabile* recently discovered by H. J. Hansen beneath the branchial integuments of *Hippolyte polaris* and *Gaimardi* of the Kara Sea. With *Choniostoma* and *Sphæronella* it must enter into the aberrant family of the Choniostomatidæ. The discovery of the still unknown male of *Choniostoma* will no doubt enable us to fix more exactly the affinities of this family.

Finally the relations between the *Aspidæcia* and the *Aspidophryxus* render it a very probable supposition that *Choniostoma* is or has been parasitic upon a branchial Bopyride of the *Hippolyte* and has usurped its dwelling-place. A memoir with plates will make known in more detail the anatomy of *Podascon* and *Aspidæcia*, and we may be permitted in conclusion to thank MM. Della Valle and A. M. Norman, who have sent us the materials for this investigation in an admirable state of preservation.—*Comptes Rendus*, April 29, 1889, p. 902.

Spontaneous Movements of the Style and Stigmata of the Cornflag
(*Gladiolus segetum*). By M. C. MUSSET.

The author notes that movements of the female organs of plants are comparatively uncommon and calls attention to an important instance in the Cornflag. In the Iridaceæ the anthers open outwards longitudinally, so that the pollen falls upon the parts of the perianth, and can only reach the stigmata by the action of the wind, the intervention of insects, &c. In the genus *Gladiolus* the style and stigmata, by their movements, get over this difficulty.

The three stamina forming the exterior whorl of the andræcium attain their final length before the styles have commenced their growth; the two posterior lateral ones incline their filaments to the right and left of the anterior stamen, so that the three anthers are juxtaposed in the same plane. At this moment they turn their dorsal surface to the style and they are also 3 centim. longer, so that direct pollination is doubly impossible. The concrescent styles situated behind the filaments grow rapidly in the direction of the dorsal line of the andræcium and soon equal the stamina in height; but the filaments bend slightly outwards, the anthers, hitherto in lateral contact, separate, and their cells open; the styles, still growing, bend in the same direction; the three stigmata also separate and move so as to come directly beneath the anthers, from which the pollen can then fall only upon the stigmatic papillæ. Direct pollination is thus insured.—*Comptes Rendus*, April 29, 1889, p. 905.