

50. Chromodorids from the Red Sea, collected and figured  
by Mr. Cyril Crossland. By Sir CHARLES ELIOT,  
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(Plate LXI. \*)

The present paper is a pendant to the one preceding it, and gives some account of three species of *Chromodoris* from the Red Sea which, though not new, are worth notice as being either varieties of known species or forms hitherto imperfectly described. The matter which it contains is mainly due to Mr. Crossland, and I have contributed merely the identification of the species and a few notes on their internal anatomy. The first species, *Chr. reticulata*, is the one on which Mr. Crossland made his interesting observations regarding the warning coloration of the genus. My own experience does not entirely support his statement that Chromodorids do not hide under stones but show themselves in the open. I have often found them (as well as *Trevelyana crocea*) under stones on tropical beaches, where their vivid colours harmonize wonderfully with the ascidians and sponges found in the same locality, so that the nudibranch which when isolated is conspicuous, is almost invisible at home. But, as Mr. Crossland points out, many species are known to arrive on the shore in considerable bands for the spawning season, and perhaps all do so. At this critical period, at all events, warning coloration must be useful to them.

The following notes on three Red Sea species indicate that there is considerable variation not only in colour but in the details of the buccal parts. In what appears to be the same species, the denticulation of the teeth and the shape of the elements in the labial armature may vary, and thickenings of the rhachis, amounting to rudimentary central teeth, may be present or absent.

CHROMODORIS RETICULATA Pease, var. (Pl. LXI. figs. 1-3.)

See Bergh, "Neue Nacktschnecken etc." No. iv., Jour. Mus. Godeffroy, Heft xiv. p. 9 ff.; and Eliot, P. Z. S. 1904, pp. 386-7.

Mr. Crossland's notes on the living animal are as follows:—

"This species is of the soft flat kind. Rhinophores with rather high cups. Gills 9, hinder ones short, set in a simple circle open behind, unbranched, simply pinnate, motionless. Foot projects slightly behind the mantle. Mantle-edge slightly or distinctly wavy, according to the extension of the animal.

"*Colour*. Greater part of the back a fine network of chocolate-brown on a grey-white ground; laterally both network and

\* For explanation of the Plate see p. 1072.





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ground-colour become yellow, forming an ill-defined yellow band which passes into white. Round the mantle-edge are two deep coloured bands, the outer orange-yellow, the inner deep violet. There is a faint line of purple round the extreme edge of the orange-yellow border. Foot and whole under side pure white except that colours of mantle-edge are repeated on the under side. The inner border of violet on upper surface is thickened in places, and these points are those where the bending of the mantle-edge is marked when the animal is half contracted.

"Rhizophores brown with clear white lines along the perfoliations; gills grey with white lines on the edge of the folia and specks elsewhere.

"One specimen measured 5.0 cm.  $\times$  1.6 cm. when fully extended."

Four specimens which have assumed a uniform dull plum-colour, no markings being visible. In most other respects they agree with Mr. Crossland's description of the living animal, but whereas he gives the gills as only 9, I find that they vary from 12 to 18. It often happens that in Chromodorids with many gills, the smaller plumes are not protruded from the pocket and thus escape notice.

The labial armature consists of bent rods, but they are not bifid as in other specimens which I have examined. In two specimens the formula of the radula was  $63 \times 50.0.50$  and  $65 \times 68.0.68$  in the widest rows. The rhachis, as in the specimens described by me from East Africa, bears triangular thickenings, in which the base is not clearly defined. The first laterals are as usual in the genus, low, flattened, and bearing 4 denticles on either side. The remaining laterals are rather stout, hamate, and bear 6-8 distinct denticles. The outermost laterals are lower and bear two or three denticles on the apex only.

These specimens are referable to *Chr. reticulata*, but seem to be a distinct variety characterized by (1) the shape of the rods in the labial armature, which are not bifid at the tips; (2) the presence of thickenings on the rhachis of the radula; (3) a violet border to the mantle. As will be seen from my previous descriptions of the species, the coloration is variable.

CHROMODORIS TINCTORIA Rüppell & Leuckart. (Pl. LXI. figs. 4 & 5.)

Rüppell & Leuckart, Neue Wirbellose Thiere des Rothen Meeres, p. 32.

A single specimen described by Mr. Crossland from the life as follows:—


"*Chromodorid* in shallow water on *Zostera* growing in sand.

"Length 98.5 mm. Breadth of mantle 46 mm.

"Body and foot are narrow, mantle more than ordinarily wide, margin thrown into folds and very mobile.

"Whole animal soft and smooth-skinned, but there are soft warts on the back, about  $\frac{1}{8}$  inch high and broad. Gills in a row



shaped  on a raised base, 18 in number, generally simple but some are forked; one quite arborescent, bipinnate. Pinnules rudimentary. The gills are completely retractile and gill-pocket can close over them. Rhinophores fully extended; numerous fine white lines on deep crimson ground, otherwise perfoliations hard to see; completely retractile. Head distinct, with prominent tentacles.

"General colour greyish white, but this is plentifully sprinkled with clear white opaque marks, so that general appearance is white. Over the body this is covered with a delicate network of crimson, the mantle being sprinkled with clear spots of the same colour. Edge of mantle bordered with a thin clear line of bright orange-yellow. A broad crimson line runs up each angle of each gill rhachis."

Mr. Crossland adds in a letter: "The margin is much more ample than in other species known to me. I have never seen one before in which the undulations are so deep or keep in such constant motion."

Rüppell and Leuckart's diagnosis is "Colore lacteo, pallii margine sulfureo-limbato: dorso venis punctisque sanguineis notato: branchiis 19 circiter, pinnatis." They also say that the branchiæ are "pyramiden-förmig," which corresponds to Mr. Crossland's observation that the pinnules are rudimentary. The coloration is sufficiently distinct to make the identity of this animal with Rüppell and Leuckart's *Doris tinctoria* certain.

The preserved specimen is somewhat distorted but the breadth of the mantle margin is still noticeable, and the shape is not that of an ordinary *Chromodoris*. The internal characters appear to be those usual in the genus. Though the outer surface of the liver is purple wherever it is covered by the hermaphrodite gland, yet the organ itself is of a deep black and leaves a strong stain.

The labial armature consists of two dark purple plates.

The rhachis bears thickenings much as in *Chr. reticulata*, and the radula is of a type common in the genus. The inner laterals are low and flattened, the innermost bear 3-4 denticles on either side; the rest are denticulate on the outer side only and the number of denticles rises gradually from 5 (on the second and third laterals) to 15 or more. The teeth at the same time become tall and elegant in shape. There are about 60 laterals in all. The marginals are denticulate on the tip only but are not degraded to mere plates.

CHROMODORIS INOPINATA (?) Bergh. (Plate LXI. figs. 6 & 7.)

Bergh, Siboga, pp. 157-159.

A single specimen described by Mr. Crossland from the life as follows:—

"? CHROMODORIS sp.

Shallow water say 3 feet deep, sand and "sea grass," in Dongonab Harbour (March 1911).



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