

decidedly different from any I have before seen. They have somewhat the external appearance, both in shape and markings of the head, of some specimens of *Cistudo amboinensis*, but belong to the genus *Emys*, or rather *Geoclemys*, and not to *Cistudo*.

They are referable to the first division of genus which has the back of the shell three-keeled, and, like the other species of that section, come from Asia.

1. *GEOCLEMYS MACROCEPHALA*.

The shell oblong, rather depressed, entire, three-keeled, olive-brown; the keels subcontinued, nearly parallel, the middle one higher and more distinct behind; the lateral ones, near the upper edge of the shields, continued, ending abruptly on the hinder edge of the third lateral discal shield; the hinder lateral and central shield only marked with a slight convexity; the margin entire, yellow-edged. The under side yellow, with black triangular spots; the sternum flat, very indistinctly keeled on the side.

Animal blackish-olive. Head large; crown flat, covered with single smooth plate, purplish-brown, with two streaks from middle of the nose, the upper edging the crown, the other the upper part of the beak, and with two streaks from the hinder edge of the orbit, the lower short and interrupted, extended on the temple, the upper broader and continued over the ear along the side of the neck; two close streaks under the nostrils to the middle of the upper jaw, and two broad streaks, dilated behind, down the front of the lower jaw, and continued on the edge of the lower jaw behind; the nape and hinder part of the side of the lower jaw covered with large flat scales; the rest of the neck and legs covered with minute granular scales; the front of the fore-legs covered with broad band-like scales; the toes of the fore- and hind-feet rather short and thick, covered above with broad band-like scales.

Hab. Siam.

The front vertebral plate is quadrangular, the front edge wider, rounded; second, third, and fourth ventral shields six-sided, the second longer than broad, the fourth broader than long; the three hinder sides are longest, the fifth vertebral shield subquadrangular, the front sides being very narrow, and the hinder side very broad and slightly truncated.

3. DESCRIPTION OF SOME NEW GENERA OF LITHOPHYTES, OR STONY ZOOPHYTES. BY DR. JOHN EDWARD GRAY, F.R.S., F.L.S., V.P.Z.S., PRES. ENT. SOC., ETC.

The Corals were formerly divided into three genera, according to the nature of their axes; viz. *Corallium* with continuous stony, *Isis* with jointed stony, and *Gorgonia* with horny axes; but many of the corals which had stony axes were referred to the last genus.

Lamouroux, in his work on 'Flexible Corals,' divided the genus

Gorgonia into three, according to the form and disposition of the cells; and, in his edition of Solander and Ellis, added a fourth under the name of *Muricea*; but still the genus *Gorgonia* was a magazine of most heterogeneous species, some closely allied to the genera which Lamouroux had established; and it is to be observed that Lamarck did not adopt the Lamourouxian genera.

Ehrenberg added another genus to the group, under the name of *Pterogorgia*; but this is synonymous with *Gorgonia* of Lamouroux, when the other genera which he describes are separated from it; and Dana seems to have felt this to be the case when he referred so many additional species to that genus.

I have in various papers added several genera to the list; and in the 'Annals and Magazine' for this month I have given an arrangement of the various published genera in a connected series.

M. Valenciennes, in his outline of the arrangement of *Gorgoniæ* in the 'Comptes Rendus,' xli. p. 14. f. 18, proposed two genera:— 1. *Gorgonella* for *Gorgonia sarmentosa*, and *Verrucella* for *Gorgonia violacea*, *G. flexuosa* and *G. furcata* of Lamarck. The specimens which I have named as *G. sarmentosa* and *G. violacea* have a horny and not a calcareous axis, and in other respects do not agree with the characters that M. Valenciennes assigns to them.

Esper's figure of *G. violacea* (Gorg. t. 12) has flat, and not produced cells, which is the essential character of the genus *Verrucella*, of which it is regarded and quoted as the type. These genera must be left for further examination. M. M.-Edwards adopts them in his 'Coralliaires,' i. p. 184.

The *Lithophytes* which have a stony axis may be divided into four groups, according to the nature of the axis and the structure of the bark, these groups being subdivided into families:—

I. *Axis continuous, not jointed; bark granular.*

Fam. 1. CORALLIADÆ.

The axis solid, calcareous, not jointed. Bark granular. Cells scattered on all sides.

1. CORALLIUM.

1. C. RUBRUM, Carolini.

Hab. Mediterranean.

2. C. SECUNDUM, Dana.

Hab. Sandwich Islands.

2. HELIANIA.

Coral fan-like, dichotomously branched; branchlets subacute, ascending, divaricate; lower branches sometimes inosculating. Bark granular, hard, even. Cells produced, subcylindrical, short, rather incurved, placed in two, three, or four alternating series on the sides of the branchlets. Axis hard, continued, calcareous, greyish-brown.

1. *HELIANIA SPINESCENS*.

Coral rather fan-like, more or less twisted; branches, especially the lower one, conical, acute, spine-like, sometimes inosculating; upper branchlet subsecund.

Hab. Philippines (*Cuming*).

Fam. 2. *ELLISELLADÆ*. ✓

The axis solid, calcareous, not jointed. Bark granular. Cells on the sides of the stem and branches separated by a lateral groove.

a. *Cell more or less elongate.*1. *ELLISELLA*.

Coral tree-like, subcylindrical; branches free. Cells numerous, small, crowded.

1. *E. JUNCEA*. ✓

2. *E. ELONGATA*. ✓

3. *E. COCCINEA*. |

4. *E. PECTINATA*. ✓

2. *SCIRPEARIA*.

Coral simple or forked; cells subcylindrical, in two alternating series.

* *Coral simple.*

S. MIRABILIS.

B.M.

S. mirabilis, Cuvier, Schweig. Beob. t. 2. f. 13.

Polypus mirabilis, Linn. Mus. Adolph. t. 19. f. 4.

Funiculina cylindrica, Lamk.

Hab. West Indies.

** *Coral branched, forked.*

S. DICHOTOMA.

B.M.

Coral fan-like, in a single plane, irregularly dichotomous; cells cylindrical, elongate, truncated, in a row on each side of the branches, subalternate.

Hab. Mauritius.

b. *Cells convex or sunken.*3. *UMBRACELLA*.

Coral fan-shaped; branches and branchlets inosculating, netted. Cells numerous, small, lateral.

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1. U. UMBRACULUM, Solander, Zooph. t. 10.

2. U. GRANULATA, Esper, Pflanzenth. t. 4.

4. PHENILIA.

Coral tree-like; branches short, subquadrangular, divaricating, sometimes coalescing, forming an irregular netted frond; branchlet subclavate. Bark granular; lateral groove distinct, scarcely sunken. Cells large, sunken, in two or three irregular rows on each side of the branches. Axis solid, hard, calcareous, horn-coloured.

1. PHENILIA SANGUINOLENTA.

Coral yellowish; branches flexuose, intertwined; branchlets short, clavate, diverging; cells large, dark brick-red, making the coral look as if spotted with blood.

Hab. —?

Fam. 3. SUBERGORGIAE.

Coral branched; branches compressed, dichotomous. Cells on the sides of the branches, with a sunken groove on each side of the stem; bark granular. Axis continuous, cork-like, soft, calcareous.

1. SUBERGORGIA.

Subergorgia, Gray, P. Z. S. 1857, pp. 159, 288.

1. S. SUBEROSA, Esper, t. 49.

B.M.

2. S. COMPRESSA, Gray, P. Z. S. 1857, p. 288.

B.M.

(See *Gorgonia Richardi*, Lamx. Pol. Flex. 407.)

2. SOLANDERIA.

Solanderia, Duchassaing, Rev. Zool. 1846, p. 218.

"Axis continuous, of a suberose texture, resembling the non-calcified joints of *Melitella*."—M.-Edw.

S. GRACILIS, Duch. *loc. cit.*

Very much branched; branchlet rounded, irregular, striated; bark tomentose or granulose.

Hab. Guadaloupe.

I have not seen this coral. The *Gorgonia suberosa* of Ellis's 'Corallines,' t. 29. f. Q & R, which has been called *Plexaura suberosa* by Lamouroux, *Briareum suberosum* by Dana, and which Ellis described as having a pale red axis "of the substance of cork," striated externally and subcylindrical, "a fleshy spongy bark, with the cells on all sides disposed in a quincunx order," would appear to be allied to the family *Annelladae*: but I have not been able to discover this coral in any collection. It would indeed appear to be intermediate

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Kölliker
1870.*

between the two families, having the corky axis of *Subergorgia* and the regularly disposed cells of the *Annelladæ*. M. Milne-Edwards (Coralliaires, i. 190) thinks that it may perhaps be a *Solanderia*.

Fam. 4. ANNELLADÆ.

Coral branched; branches cylindrical, of equal diameter. Cells equally scattered on all sides of the branches; bark granular. Axis solid, calcareous, continuous.

1. ANNELLA.

Coral netted; branchlet inosculating.

Annella reticulata, Gray, P. Z. S. 1857, p. 287.

Fam. 5. PRIMNOADÆ.

Primnoadæ, Gray, P. Z. S. 1857, p. 285.

* *Cell campanulate; scales large.*

1. PRIMNOA.

Coral tree-like, forked.

† *Coral tree-like, branched.*

1. P. LEPADIFERA.

Hab. Mediterranean.

†† *Coral simple, with simple spreading branches.*

2. P. ANTARCTICA, Valenc. Voy. Venus, t. 12. f. 2.

Hab. Falkland Islands.

** *Cells tubular, incurved; scales small.*

2. PRIMNOELLA.

Primnoella, Gray, P. Z. S. 1857, p. 286.

Coral simple. Cells numerous, in close whorls, closely pressed to the stem.

P. AUSTRALASIÆ, Gray, P. Z. S. 1849, p. 146. t. 2. f. 8, 9.

The calcareous axis, described as *Virgularia australis* by Lamarck, Hist. A. S. V. ii. 648, is, I believe, the axis of this coral, or of a very nearly allied species. Seba, Thes. iii. t. 111. f. 2, to whom Lamarck refers, properly represents these axes as attached.

Hab. Australasian Sea, Bass Strait: on oyster-shells and stones.

3. CALLOGORGIA.

Coral fan-like, pinnate. Cells in whorls.

C. VERTICILLATA.

B.M.

Gorgonia verticillata, Pallas.

Gorgonia verticillans, Linn.

Primnoa verticillans, Ehrenb.

Muricea verticillans, Dana.

Cells in close whorls of three or six.

Hab. Mediterranean.

CALLOGORGIA FLABELLA.

Gorgonia verticillans, Esper, Pflanzenth. t. 42. f. 1, 2, 3.

Primnoa flabellum, Ehrenb.

Cells in close whorls of eight or ten.

Hab. Red Sea.

CALLOGORGIA PLUMATILIS, Edw. Coralliaires, 141.

Cells small, seldom more than two in a whorl.

Hab. Isle of Bourbon.

Is this *Gorgonia pluma*, Lamk.?

CALLOGORGIA GRACILIS, Edw. Coralliaires, 141.

Cells very small; whorls far apart, and generally of four cells.

Hab. West Indies.

4. MYURA.

Coral elongate, simple. Cells elongate, incurved in two rows on each side of the stem; medial groove distinct.

MYURA SIMPLEX.

Mus. Paris.

Gorgonia myura, Lamk.

Muricea myura, Dana.

Primnoa myura, Edw. Coralliaires, i. 142. t. 132, f. 3.

Coral elongate, simple, slender.

Hab. —?

II. *Axis jointed, joints swollen, porous.*

Fam. 6. MELITEADÆ.

Branches from the swollen joints of the stem.

* *Cells in a series on each side of the branchlets, elongate, sub-cylindrical, rather tapering.*

1. ACABARIA.

Coral fan-like, dichotomous; branches diverging. Axis solid, calcareous.

A. DIVARICATA.

Coral fan-like; branches dichotomous, diverging, very slender; the lateral branches diverging at right angles from the stem and branches; bark thin, yellow, granular. Cells produced, subcylindrical on each side of the branches, in alternating series. Axis calcareous, red, solid, longitudinally grooved; internodes swollen, spongy.

Hab. — ?

** *Cells slightly prominent, in two or more series on the sides of the branches; branches and branchlets compressed, tapering.*

2. MELITÆA.

Coral fan-like, forked; branches subparallel. Cells in two or three series on the sides of the branchlets. Axis calcareous, spongy, with numerous sinuous tubes.

MELITÆA OCHRACEA, Esper, Pflanzenth. t. 4 a. t. 11. f. 1, 2.

Hab. — ?

Var. 1. Bright yellow, with red cells on side of branchlets.

Var. 2. Red, with yellow cells on sides of branchlets.

The branches very rarely inosculate. The cells are small, not prominent, in two series on each side of the branchlets, leaving the inner and outer surface nearly bare and smooth. The axes of the branchlets are rather solid and calcareous, that of the stem is porous, pierced with numerous tortuous cylindrical tubes; the branchlets are moderately short.

3. MELITELLA.

Coral fan-like, forked; branches subparallel, more or less coalescing. Cells rather produced, numerous, crowded on the two sides and one surface of the branchlets. Axis solid, calcareous.

† *Branches virgate, subparallel, rarely inosculating.*

1. MELITELLA ELONGATA.

B.M.

Orange, branches virgate, subparallel, much divided; branchlets slender, elongated, compressed, sometimes inosculating; articulation of the branchlets very long, slender, compressed.

Isis ochracea, var., Esper, Pflanzenth. t. 4 a, f. 2, 4, 5 (not 3).

Melitea ochracea, var. *lutea*, Lamk.

Hab. — ?

This coral is very like *Melitæa ochracea*, and has most probably been hitherto confounded with it; but it is easily distinguished from it by the cells being much more numerous and crowded, and by the solidity of the axis.

Esper's figures somewhat represent the species, but the cells are not sufficiently crowded nor numerous in figs. 4 and 5; yet some of

them are represented in the middle of the branchlet, as well as on the side, where I have never observed them in *Melitæa ochracea*.

† *Branchlets divaricated, reticulating, inosculating.*

2. MELITELLA RETIFERA.

B.M.

Melitæa retifera, Lamk.

Isis coccinea, Esper, Pflantz. t. 10.

Isis aurantia, Esper, t. 9? Cells too prominent and conical; branches diverging.

Var. ? *Melitæa textiformis*, Lam. Pol. Flex. 465. t. 19. f. 1; Esper, t. 71. f. 5.

3. MELITELLA COCCINEA, Lamk.

B.M.

Isis coccinea, Ellis, Zooph. t. 12. f. 5.

M. Rissoi, Lamk.

4. MELITELLA ? TENELLA.

Melitæa tenella, Dana, Zooph. 683.

4. MOPSELLA.

Coral tree-like, forked; branches diverging. Cells on the sides and one surface of the branches; other surface smooth. Axis calcareous, solid, longitudinally grooved.

1. MOPSELLA DICHOTOMA.

B.M.

Mopsea dichotoma, Lamx.

Isis dichotoma, Esper, Pflantz. p. 5. t. 11. f. 4, 5.

Joint short, thick, striated.

2. MOPSELLA GRACILIS.

B.M.

Coral very slender, thread-like; joint elongate, slender, pale red; articulations only slightly swollen; branches divaricating, the first rather rounded at their base.

Hab. — ?

*** *Cells not prominent, scattered equally on all sides of the branches; branches cylindrical, of a nearly uniform thickness. Axis solid.*

5. CLATHRARIA.

Coral tree-like, erect; branches few, inosculating, tortuous; branchlets, some free, blunt; bark thin, granular. Cells numerous. Axis solid; joints elongate, white, longitudinal, striated; internode red, spongy.

1. CLATHRARIA RUBRINODIS.

B.M.

Hab. — ?



Gray, John Edward. 1859. "3. Description of some New Genera of Lithophytes, or Stony Zoophytes." *Proceedings of the Zoological Society of London* 27, 479–486.

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