

MATERIALS TOWARD A NATURAL CLASSIFICATION OF THE CYLINDRELLOID SNAILS.

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While recording some recent additions to the North American landsnail fauna with the intention of revising the "Check List" of United States land mollusks published in these *Proceedings* for 1889, the attention of the senior author was recalled to the rejection of the generic name *Cylindrella* by Messrs. Harris and Burrows in 1891, and their substitution of a new name for the group. Upon compiling a list of the generic and subgeneric names which have been applied to species of "*Cylindrella*," it became obvious that a thorough taxonomic revision was urgently needed. In order to ascertain which of the numerous names should be retained as valid, to place these upon a solid basis, and to reduce the remainder to synonyms, it was found necessary to supplement a review of the literature of the group by an examination of the snails themselves, especially with reference to the radulæ, and the internal characters of the shells, revealed by a study of sections cut to expose the internal columella or axis. This detailed examination has been made chiefly by the junior author of this paper.

The characters of the radula have been utilized as a basis for classification by Crosse and Fischer in 1870, their paper marking an epoch in the taxonomic history of this family. W. G. Binney has added to our knowledge of this subject upon the lines laid down by the French writers; and later, Strebel and Pfeffer, in their suggestive and original series of papers upon the Mexican fauna, have made important contributions toward a rational classification of the group. There are many other writings bearing upon the nomenclature of the *Cylindrellas*, but no others of importance for original facts or views concerning their phylogeny or structure, aside from mere species work.

The external conchologic characters of the *Cylindrellas* are well known by the writings of Pfeffer, Poey and others, but the modifications of the internal armature have been far less fully elucidated. A portion of Pfeffer's descriptions mention briefly the internal structure, and some of the plates of the *Novitates Conchologicæ*



and *Malakozoologische Blätter* represent it; and Arango, in his *Contribucion a la Fauna Malacologica Cubana*, notes the internal structure of the Cuban species. Most of these observations, however, are not sufficiently detailed or exact to meet the requirements of the case, now that a classification is based largely upon internal structure; and our own work is therefore founded wholly upon the study of a series of sections including nearly every species in the collection of the Academy.

Without entering into any elaborate exposé or criticism of the work of former authors upon the *Cylindrellas*, attention should be directed to the contention of Crosse & Fischer<sup>1</sup> and later of Fischer<sup>2</sup> that the series should be distributed between two family groups, the *Cylindrellidæ* and the *Pupidæ*, a conclusion based wholly upon the structure of the teeth and jaws; the first family having greatly modified teeth and plaited jaw, the second having normal dentition and solid jaw.

That this splitting of the *Cylindrellas* into two is an unnatural division, seems to us to be proven by the following considerations: (1) The discovery of completely *Cylindrelloid* shells (*Epirobia*) with the "normal" type of teeth. (2) The presence of transition stages in the teeth in the genus *Holospira*, and (3) the recent demonstration by the senior author of this paper<sup>3</sup> of the rapid changes undergone by the teeth of some genera under the stress of changed habits, without corresponding changes in the rest of the anatomy, as seen in *Papuina*, *Polymita*, etc. (4) The general law of change in the structure of the jaw, as illustrated in the families *Endodontidæ* and *Helicidæ*, must now be recognized as largely discounting the old value placed upon that organ as a factor in systematic malacology; and in any family of snails we may expect to find both the more primitive plaited and the later solid type of jaw. The final reason for rejecting the idea that any of the group under consideration are *Pupidæ*, is that none of them, so far as known, possess the extremely characteristic complication of the male genital organs found in *Pupa*, *Buliminus*, *Clausilia*, and their immediate allies, and which constitute one of the most important characters of the family *Pupidæ*.

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<sup>1</sup> Journ. de Conchyl., 1870.

<sup>2</sup> Manuel de Conchyliologie.

<sup>3</sup> Manual of Conchology (2), IX, introduction and portions relating to arboreal Helices.



Our further observations upon the family may be grouped under five heads:—

- I. Names applied to generic and minor groups of Cylandrelloid snails.
- II. Key to the genera and subgenera.
- III. Classified lists of the species with zoo-geographic and other notes.
- IV. Brief sketch of other genera of the family.
- V. Provisional phylogenetic diagram and table of geographic distribution.

# I. CHRONOLOGICAL LIST OF NAMES APPLIED TO CYLANDRELLOID SNAILS.

(Exclusive of those pertaining to *Lia*, *Macroceramus*, *Holospira*, and other generally recognized genera).

1822 (or earlier). COCHLODINA Férussac, Tableau Systematique, etc., p. 24, 61.

Under *Helix*, Férussac establishes a "Quatorzième sous-genre. Cochlodine, *Cochlodina* nobis." The subgeneric definition applies better to *Clausilia* than to the other forms included by Férussac in the group; and, indeed, seems to be based wholly upon that genus.

The species of *Cochlodina* are classified as follows:—

\*Shell dextral.

† Aperture without teeth or laminae.

## 1. Peristome not continuous.

Premier groupe. Les Pupoides, *Pupoides*.

493 *carinata* Gmel. [= *Macroceramus lineatus* Brug.].

494 *nebulosa* nobis. [*nomen nudum*].

495 *ignifera* nobis. [*nomen nudum*].

## 2. Peristome continuous.

Deuxième groupe. Les Tracheloides, *Tracheloides*.

496 *sloanii* nobis. [*nomen nudum*].

497 *draparnaldi* nobis. [*nomen nudum*].

498 *petiveriana* nobis. [probably = *C. eximia* Pfr.].

499 *blainvilliana* nobis. [*nomen nudum*].

500 *cylindrus* Chemn. [= *Cylindrella*].

501 *rosata* nobis. [*nomen nudum*].

502 *truncata* Dillw. [Undeterminable? = *Megalomastoma*].

503 *fasciata* Lam. [Undeterminable? = *Megalomastoma*].



504 *tortuosa* Chemn. [= *Tortulosa tortuosa*, an oriental operculate].

505 *gracilicollis* nobis. [*nomen nudum*].

506 *perplicata* nobis. [*nomen nudum*].

507 *collaris* nobis. [= *Cylindrella*].

508 *subula* nobis. [*nomen nudum*].

509 *antiperversa* nobis. [*nomen nudum*].

†† Aperture armed with large folds or long teeth.

510 *gargantua* nobis [*nomen nudum* = *Odontostomus*].

\*\* Shell sinistral.

### 1. Aperture without laminæ.

Troisième groupe. Les Anomales, *Anomales*; *Pupa* Drap.

511 *perversa* L. [= *Balea*].

512 *chemnitziana* nobis. [*Cylindrella elongata* Chemn.].

### 2. Aperture armed (with laminæ or an elastic operculum).

Quatrième groupe. Les Clausilies, *Clausilia*; genre *clausilie* Drap.

[Includes the species of *Clausilia*, with some *nomina nuda* perhaps pertaining to other groups].

It will be seen that *Cochlodina* is a miscellaneous group, including species of at least six modern genera, all of which have since been named. Under these circumstances it had better be left as a synonym of *Clausilia*, as the diagnosis precludes its use for any of the other groups included.

1828. BRACHYPUS Guilding, Zool. Journal, III, p. 167. Proposed for *B. costatus* Gldg. Preoccupied in *Aves* by Swainson, 1824, and in *Diptera* by Meigen in the same year.

1837. UROCOPTIS Beck, Index Moll., p. 83. Species, *petiverana* Fér., *blainvilliana* Fér., *cylindrus* Ch., Dw. and Wood; *rosata* Fér., *glandula* B., *abbreviata* B., *coarctata* B., List H., XXI, 17; *truncatula* Lam. (*Clausilia*), *gracilicollis* Fér.

J. E. Gray, in Proc. Zool. Soc. Lond., 1847, p. 177, selects "*Turbo*" *cylindrus* as type. This would make the group equivalent to *Thaumasia* Alb. a later name. Von Martens, in Die Heliceen, 1860, names *decollata* Nyst as type. This species belongs to Crosse and Fischer's later group *Eucalodium*; and as it does not appear in Beck's original list of species, must be rejected from the group. *Urocoptis* is the earliest tenable name for any genus of the family.

1837. BRACHYPODELLA Beck, Index Moll., p. 89. Proposed for *perplicata* Fér., *collaris* Lam., *subula* Fér., *antiperversa* Fér.



1837. *APOMA* Beck, Index Moll., p. 89. For *elongata* Chemn. (*chemnitziana* Fér.). Gray, 1847, and Mörch, 1852, retain the name for this species.

1840. *CYLINDRELLA* Pfeiffer, Archiv für Naturg., p. 41. For the following species:

*Gracilicollis* Fér. [a *Brachypodella*] *collaris* Lam. [a *Brachypodella*] *antiperversa* Desh. [a *Brachypodella*], *subula* Desh. [type of the later group *Mychostoma* Alb.], *perplicata* Fér. [a *Brachypodella*], *chemnitziana* Desh. [type species of the earlier group *Apoma* Beck], *elegans* Pfr. [type of the later group *Gongylostoma* Alb.], *crispula* Pfr. [a species of the later group *Gongylostoma*], ? *torticollis* (Oliv.) Lam. [= *Clausilia* of the section *Bitorquata* Bttg.].

Another *Cylindrella*, in *Conidæ*, was proposed in 1840 by Swainson (Malacology, p. 311), and still again, for the group now generally known as *Cylichna* (t. c. p. 326. See Man. of Conch., XV, p. 287). It is now, so far as we know, impossible to decide whether Pfeiffer's group was published prior to Swainson's or *vice versa*. Cossmann has proposed to substitute the term *Distæctria* (q. v.) for *Cylindrella* Pfr. As *Cylindrella* is later than both *Urocoptis* and *Brachypodella*, and the same name was used in the same year for two other groups, we reject it from the nomenclature of this family.

1840. *SIPHONOSTOMA* Swainson, Treatise on Malacol., pp. 168, 333. For *costata* Gldg. and *fasciata* (Encycl. Meth., pl. 461, f. 17). Name preoccupied by Voigt in Vermes, 1836; also used in Rotifera, 1832.

1847. *BRACHYPODISCA* Agassiz, Nomenclator Zool., Index Universalis, p. 51. An emendation, upon etymological grounds, of *Brachypodella* Beck.

1850. *THAUMASIA* Albers, Die Heliceen, p. 207. Proposed for *decollata* Nyst, *liebmanni* Pfr., *gruneri* Dkr., *cylindrus* Chemn., *sanguinea* Pfr., *brevis* Pfr., *binneyana* Pfr.

The two first species belong to *Eucalodium*, the rest to the Jamaican and Haytien group of large *Cylindrellas*. Name preoccupied by Perty in Arachnida, 1830. *Spartina* (q. v.) has been proposed as a substitute, but it is superfluous, as the group is a synonym of *Urocoptis* Beck, 1837.

1850. *MYCHOSTOMA* Albers, Die Heliceen, p. 207. Proposed for *subula* Fér., *collaris* Fér., *gracilicollis* Pfr., *hanleyana* Pfr., *pallida* Guild., *seminuda* Adams.

In the second edition of Die Heliceen, 1860, p. 37, von Martens selects *C. subula* as type.



1850. GONGYLOSTOMA Albers, Die Hel., p. 208. Proposed for *sowerbyana* Pfr., *humboldtiana* Pfr., *rosea* Pfr., *variegata* Pfr., *elegans* Pfr., *crispula* Pfr., *sagraiana* Pfr., *porrecta* Gould, *philippiana* Pfr.

From this list of species, von Martens selected *elegans* as the type, in Die Heliceen, 1860, p. 38.

1850. CASTA Albers, Die Heliceen, p. 208, proposed for *elongata* Ch. and *gracilis* Wood, the former selected as type by von Martens, 1860. This group is absolutely equivalent to *Apoma* Beck, 1837.

1852. STROPHINA Mörch., Catal. Yoldi, p. 35. Proposed for *laterradii* Grat. only.

1853. TRACHELIA Pfr., Monogr. Hel. Viv., III, p. 564. Proposed for *marmorata* Shutt., *volubilis* Morel., *porrecta* Gld., *gracillima* Poey, *speluncæ* Pfr., *subtilis* Morel., *gouldiana* Pfr., *rugeli*, Shutt., *riisei* Pfr., *cinerea* Pfr., *morini* Morel., *philippiana* Pfr., *scalarina* Shutt.

These are mainly slender *Brachypodella* species. Name preoccupied by Scopoli in Aves, 1777, by Serv. in Coleoptera, 1834, and by Westwood in Coleoptera, 1839. It is, therefore, rejected from molluscan nomenclature.

1870. CALLONIA Crosse & Fischer, Journal de Conch., 1870, p. 18. Based upon one species, *Cyl. elliotti* Poey.

1880. EPIROBIA Strebel & Pfeiffer, Beitr. zur Kenntniss der Fauna Mex. Land- und Süsswasser-Conch., Theil IV, pp. 77, 85. Proposed for *Cylindrella berendti*, *polygyra*, *morini* (not of Morelet), *apiostoma*.

This is a valid genus, well distinguished by the dentition and hollow axis.

1891. DISTÆCTRIA Cossmann in Harris and Burrows, Eoc. and Oligoc. Beds Paris Basin, pp. 100, 114. Proposed as a substitute for *Cylindrella* Pfr., no reason being given for the change. By reference to the list of species originally assigned to *Cylindrella*, it will be seen that long before the year 1891, every one was amply provided with generic names, *Gongylostoma* Alb. and *Brachypodella* Beck including all of them. The name *Distæctria*, therefore, falls as a synonym. Being of even date with *Spartina* Harr. & Burr. (*q. v.*), it might possibly dispute supremacy with that term as a generic name for "*Cylindrella*" *parisiensis* Desh.; but it is obvious that that species (which, in our opinion, is not a *Cylindrella* nor a member of the same family), does not require both a generic and subgeneric name.



1891. SPARTINA Harris & Burrows, The Eocene and Oligocene Beds of the Paris Basin, pp. 100, 113 (Sept. 23, 1891). Proposed as a substitute for *Thaumasia* Alb., 1850 (not Perty, 1830-1834).

As *Thaumasia* is based partly on species of *Eucalodium* (Crosse & Fischer, 1868), and partly on species of *Urocoptis* (Beck, 1837), the name *Spartina* falls as a synonym under these groups, unless, indeed, it be retained for the Paris Basin Eocene species described by Deshayes as "*Cylindrella*" *parisiensis*, which is the only species mentioned under *Spartina* by Harris and Burrows. See under *Distactria*.

## II. ANALYTICAL KEY TO CYLINDRELLOID GENERA AND THEIR SUBDIVISIONS.

(Exclusive of the generally recognized genera *Lia*, *Macroceramus*, *Eucalodium*, etc.).

I. Axis of the shell a solid, not perforated, column; teeth of the radula very peculiar, the centrals very narrow, laterals with gouge-shaped cusps.

a. Radula with large posterior cusps (ectocones) upon all of the side teeth, which are of similar form, gradually becoming smaller from the inner to the outer edge of radula, generally with no abrupt break in size between lateral and marginal teeth; rows slanting, "*en chevron*" (Pl. XVII, fig. 5). Genus UROCOPTIS Beck.

b. Axis slender and simple, without spiral laminae or other processes. Subgenus UROCOPTIS.

c. Shell large, stout and fusiform; axis straight.

Section *Urocoptis* s. s.

c<sup>1</sup>. Shell small, thin and fusiform; axis straight.

Section *Cochlodinella* P. & V.

c<sup>2</sup>. Shell small, pillar-shaped; axis sigmoid below.

Section *Spirostemma* P. & V.

b<sup>1</sup>. Axis with a single, strong, smooth spiral lamina, median in each whorl. Subgenus ARANGIA P. & V.

b<sup>2</sup>. Axis with two series of hooks curving toward each other, or with a series of oblique nodes or ribs.

Subgenus IDIOSTEMMA P. & V.

b<sup>3</sup>. Axis with a single stout spiral fold crenulated at the edge. Section *Maceo* P. & V.

b<sup>4</sup>. Axis with one or several spiral laminae, the lower of



which is cut into teeth or crenulated, *at least in the earlier whorls.* Subgenus GONGYLOSTOMA Alb.

*c.* Three to seven spiral laminae developed, increasing in size from the upper to the lowest one, which is largest. Section *Pycnoptychia* P. & V.

*c*<sup>1</sup>. Three laminae, the lowest smallest, upper largest.

Section *Callonia* C. & F.

*c*<sup>2</sup>. Two subequal spirals; a median whorl with accessory laminae upon the upper and basal walls.

Section *Sectilumen* P. & V.

*c*<sup>3</sup>. Two spirals, the lower dentate in upper whorls, and in an intermediate whorl expanding into a very broad, flat or cup-like plate.

Section *Esochara* P. & V.

*c*<sup>4</sup>. Two gradually increasing spirals, the lower crenulate or denticulate; sometimes a short, low, third spiral interposed in an intermediate whorl.

Section *Gongylostoma* *s. str.*

*c*<sup>5</sup>. Two strong, subequal spirals, both crenulated or denticulate (Haiti).

Section *Amphicosmia* P. & V.

*c*<sup>6</sup>. One incised or denticulate lower lamina with sometimes a smaller one above it.

Section *Tomelasmus* P. & V.

*a*<sup>1</sup>. Radula with the posterior cusp (ectocone) sub-obsolete or wanting on the first or both lateral teeth; two laterals on each side enormously developed, the marginals abruptly smaller, narrow, probably functionless, with vestigial cusps; arranged in horizontal lines (Pl. XVII fig. 4). Axis of the shell without laminae.

Genus BRACHYPODELLA Beck.

*b.* Inner lateral tooth with a vestigial posterior cusp (ectocone) without cutting point; outer lateral with cutting point developed on the ectocone.

Subgenus BRACHYPODELLA.

*c.* Axis slender throughout, rarely with a small spiral fold; shell slender and elongate.

Section *Brachypodella* *s. str.*

*c*<sup>1</sup>. Axis strong, heavily calloused; shell obese.

Section *Strophina* Mörch.



*b*<sup>1</sup>. Inner lateral tooth with no ectocone; that of the outer lateral without cutting point. Species all Jamaican.

*c*. Axis slender, straight; last whorl of shell becoming free, and keeled below; aperture subcircular, angular below, as wide as high.

*d*. Shell small, narrowly fusiform, with strongly ribbed whorls. Section *Geoscala* P. & V.

*d*<sup>1</sup>. Shell slender, pillar-like, white and smooth, of many narrow whorls.

Section *Mychostoma* Alb.

*c*<sup>1</sup>. Axis a mere edge of contact between whorls; shell white, sinistral, slender, of many oblique whorls, the last not free; aperture oval, longer than wide.

Section *Apoma* Beck.

II. Axis of the shell a hollow column; radula of normal form and arrangement; central teeth tricuspid, short and wide; laterals numerous, similar, bicuspid; marginals wide, very short, multicuspid (Pl. XVII, fig. 2).

*a*. Shell very slender and elongate, thin, not conspicuously calcareous, the axis subcylindrical or bulging in each whorl, usually rugose. Genus *EPIROBIA* S. & P.

*a*<sup>1</sup>. Shell stout, pupiform, with entire spire, conspicuously calcareous, etc., etc. Genus *HOLOSPIRA* Mart.

### III. CLASSIFIED LISTS OF SPECIES.

As the groups defined by us in the preceding table of classification differ radically in limits from those hitherto accepted, it is necessary to supplement the characterization of the genera and subgenera by detailed lists of species. These lists contain only species whose characters we have ascertained by the examination of sections. Those we have not been able to examine are omitted,<sup>4</sup> although a large part of them could doubtless be approximately grouped by the published information.

The names of species of which the radula is known are distinguished by the following symbols: "(C F)" after the name of a species indicates that the dentition has been examined by Crosse &

<sup>4</sup> The lists are, therefore, a catalogue of the species in the collection of the Academy, excluding a considerable number of doubtful, unidentified or new species. Any forms not mentioned herein we will be glad to receive and offer an exchange for.



Fischer;<sup>5</sup> "(B.)" that it has been examined by W. G. Binney;<sup>6</sup> "(S P.)" by Strebel & Pfeffer;<sup>7</sup> "(P V.)" by ourselves.

Genus **UROCOPTIS** Beck.

This genus is restricted to Cuba, Jamaica and Haiti, with a few stragglers from the Cuban fauna in south Florida. It is practically a group of the Greater Antilles. The typical forms, with the axis simple, are the most widely spread and probably the oldest type. The large, stout forms being a local development common to Jamaica and Haiti.

The forms with spiral folds or other ornamentation of the axis are confined to Cuba and the adjacent portion of Haiti. There is every reason to believe them autochthonous to Cuban soil, a few species recently spreading eastward.

This genus shows the bond between Jamaica and Haiti to be rather stronger than between Cuba and Haiti, the Cuban groups occurring in Haiti being represented by very few species, and these restricted to the extreme western end of the island.

The elements common to Jamaica and Cuba are the more generalized and presumably older sectional groups of the genus.

Respecting the habits and environment of the Jamaican *Cylindrellas* of both the genera *Urocoptis* and *Brachypodella*, Mr. Charles T. Simpson writes of the experiences of Mr. J. B. Henderson and himself, as follows: "*C. sanguinea*, *rosea*, *obesa*, *cylindrus*, *aspera*, *brevis* and allied forms live on the ground among the scrub and dead leaves, and are of just about the color of their surroundings. We found *C. nobilior* abundant in a talus of decomposed shaly rock at Bogwalk, of which it was almost exactly the color. *C. seminuda*, *alba* and *robertsi* are found in the crevices of craggy limestone rocks, among cliffs. *C. rubra* and *tenella* live in the ground in thickets where there is abundance of dead and decaying wood. The shells, in form and color, always look exactly like pieces of broken twigs, which are found abundantly with them, and it was a long time before Henderson and I found a single specimen. They are very abundant though in proper localities. *C. gracilis* Wood grows invariably on the trunks and stems of trees in thick scrub. These trees have grayish or whitish spotted bark; the little rascals attach themselves to it by the foot and stand out with the shell nearly at

<sup>5</sup> Journal de Conchyliologie, 1870.

<sup>6</sup> Ann. N. Y. Acad. Sci., III.

<sup>7</sup> Beitr. Mex. Moll.



right angles to the trunk or limb, and as the shell is always more or less dirty, the resemblance to a thorn is so astonishing that we doubtless passed by thousands of them, never dreaming for a moment that they were *Cylindrellas*."

Mr. Uselma C. Smith found *B. elongata* living on limestone cliffs, upon which the white shells hung like stalactites, for which he at first mistook them.

Subgenus **Urocoptis** Beck.

Type *U. cylindrus* (Chemn.), Pl. XVIII, fig. 11 (axis) and Pl. XVII, fig. 5 (dentition).

Section **UROCOPTIS**, s. s.

Species of Jamaica.

<i>U. amethystina</i> (Chitty).	<i>U. megacheila</i> (Chitty).
<i>U. aspera</i> (Ad.).	<i>U. nobilior</i> (Ad.).
<i>U. baquieana</i> (Chitty).	<i>U. procera</i> (Ad.).
<i>U. brevis</i> (Pfr.) [C F.].	<i>U. rosea</i> (C. B. Ad. not Pfr.)
<i>U. carnea</i> (Ad.).	[C F., B., S P., P V.].
<i>U. cylindrus</i> (Chemn.).	<i>U. sanguinea</i> (Pfr.) [C F.].
<i>U. gravesii</i> (Ad.).	<i>U. zonata</i> (Ad.).
<i>U. lata</i> (Ad.).	

Species of Hayti.

<i>U. adamsiana</i> (Pfr.).	<i>U. gruneri</i> (Pfr.).
<i>U. arcuata</i> (W. & M.).	<i>U. guigouana</i> (Petit).
<i>U. crenata</i> (W. & M.).	<i>U. mabuja</i> (Weinl.).
<i>U. eugenii</i> (Dohrn).	<i>U. malleata</i> (Pfr.).
<i>U. eximia</i> (Pfr.).	<i>U. menkeana</i> (Pfr.).
<i>U. flammulata</i> (Pfr.).	<i>U. puncturata</i> (Pfr.).

Section **COCHLODINELLA** Pils. & Van.

Type *U. poeyana* (Orb.). Radula with 12.1.12 teeth, which are typical for the genus in form, but decrease rather rapidly.

Species of Cuba and Florida.

<i>U. angulifera</i> (Gundl.).	<i>U. mamillata</i> (Wright).
<i>U. atropurpurea</i> (Arango).	<i>U. mixta</i> (Wright).
<i>U. goniosoma</i> (Gundl.).	<i>U. paradoxa</i> (Arango).
<i>U. illamellata</i> (Wright).	<i>U. poeyana</i> (Orb.) [B., P V.].
<i>U. jejuna</i> (Gld.).	<i>U. presasiana</i> (Pfr.).
<i>U. lactaria</i> (Gld.).	<i>U. variegata</i> (Pfr.).



## Species of Jamaica.

<i>U. augustæ</i> (C. B. Ad.).		<i>U. pupæformis</i> (C. B. Ad.).
<i>U. hollandi</i> (C. B. Ad.).		<i>U. striata</i> (Chitty).
<i>U. hydrophana</i> (Chitty).		

## Section SPIROSTEMMA Pils. &amp; Van.

Type *U. rubra* (C. B. Ad.), Pl. XVIII, fig. 12. The species are all Jamaican.

<i>U. dunkeriana</i> (Pfr.).		<i>U. rubra</i> (C. B. Ad.).
<i>U. montana</i> (C. B. Ad.).		<i>U. similis</i> (C. B. Ad.).
<i>U. princeps</i> (C. B. Ad.).		<i>U. tenella</i> (C. B. Ad.).
<i>U. pusilla</i> (C. B. Ad.).		<i>U. tenera</i> (C. B. Ad.).

Subgenus **Arangia** Pils. & Van.

Type *C. sowerbiana* Pfr., Pl. XVIII, fig. 20. Subgeneric name in memory of the Cuban naturalist, Rafeal Arango.

<i>U. sowerbiana</i> Pfr., Cuba.		<i>U. monticola</i> Weinl. Gonave I.
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Subgenus **Idiostemma** Pils. & Van.

Type *C. uncata* Gundl., Pl. XVII, fig. 10.

A Cuban group, containing some of the most peculiar species of the genus. There is a series of species leading by gradual stages from the axial pairs of hooks of the typical forms to the oblique nodes or ribs of *U. lateralis*, etc.

<i>U. uncata</i> (Gundl.).		<i>U. geminata</i> (Pfr.).
<i>U. perlata</i> (Gundl.) [C F., P.V.]		<i>U. fastigata</i> (Gundl.).
<i>U. lævigata</i> (Gundl.).		<i>U. lineata</i> (Gundl.).
<i>U. intusmalleata</i> (Gundl.).		<i>U. lateralis</i> (Paz.) [P V.].

## Section MACEO Pils. &amp; Van.

Radula with the teeth very rapidly decreasing, the third decidedly smaller than second, formula about 8.1.8. Subgeneric name in honor of a Cuban patriot.

*U. interrupta* (Gundl.) [P V.], Cuba. Pl. XVII, fig. 7.

Subgenus **Gongylostoma** Albers.

## Section PYCNOPTYCHIA Pils. &amp; Van.

Type *U. humboldtiana* (Pfr.), Pl. XVIII, fig. 14. Species all Cuban.

<i>U. humboldtiana</i> (Pfr.) [B.].		<i>U. striatella</i> (Wright).
<i>U. oviediana</i> (D. Orb.).		<i>U. trilamellata</i> (Pfr.).
<i>U. scæva</i> (Gundl.) [C F.].		<i>U. vignalensis</i> (Wright) [C F.].
<i>U. shuttleworthiana</i> (Poey).		



## Section CALLONIA Crosse &amp; Fischer.

Type *C. elliotii* Poey. Radula typical. See Pl. XVIII, fig. 18, *U. dautzenbergiana* (Crosse). Species all Cuban.

We have enlarged the group of Crosse and Fischer to include other Cuban species having the same internal structure and dentition.

Species elaborately sculptured with hollow ribs:—

<i>U. elliotii</i> (Poey) [C F.].		<i>U. dautzenbergiana</i> (Crosse)
		[P V.].

Somewhat smooth species:—

<i>U. brunnescens</i> (Gundl.).		<i>U. notata</i> (Gundl.).
<i>U. clara</i> (Wright).		<i>U. vineta</i> (Gundl.).
<i>U. guirensis</i> (Gundl.).		<i>U. saxosa</i> (Poey).
<i>U. infortunata</i> (Arango).		

Species with beaded suture:—

*U. albocrenata* (Gundl.)

## Section SECTILUMEN Pils. &amp; Van.

*U. ornata* (Gundl.) [B., P V.]. Cuba. Pl. XVII, fig. 9.

## Section ESOCHARA Pils. &amp; Van.

Type *U. strangulata* (Poey), Pl. XVIII, fig. 15. Distribution, Cuba.

<i>U. fabreana</i> (Poey) [P V.].		<i>U. teneriensis</i> (Wright).
<i>U. strangulata</i> (Poey).		

## Section GONGYLOSTOMA Albers (restricted).

Type *U. elegans* (Pfr.), Pl. XVIII, fig. 17 (variety). Also Pl. XVIII, fig. 16, *U. pruinosa*. Distribution, Cuba.

<i>U. artemesiæ</i> (Gundl.).		<i>U. fortis</i> (Gundl.).
<i>U. auberiana</i> (D. Orb.).		<i>U. gutierezi</i> (Arango).
<i>U. concreta</i> (Gundl.).		<i>U. lavalleana</i> (Orb.).
<i>U. coronadoi</i> (Arang).		<i>U. obliqua</i> (Pfr.).
<i>U. crispula</i> (Pfr.).		<i>U. planospira</i> (Pfr.).
<i>U. elegans</i> (Pfr.) [B., P V.].		<i>U. pruinosa</i> (Morel.) [P V.].

## Section TOMELASMUS Pils. &amp; Van.

Type *U. torquata* (Morel.), Pl. XVII, fig. 8; also Pl. XVIII, fig. 13, *U. wrighti* var. Radula typical. Species all Cuban.



<i>U. aculeus</i> (Morel.).	<i>U. heynemani</i> (Pfr.).
<i>U. acus</i> (Pfr.).	<i>U. hidalgoi</i> (Arango).
<i>U. adnata</i> (Pfr.).	<i>U. hilleri</i> (Pfr.) [P V.].
<i>U. affinis</i> (Pfr.) [P V.].	<i>U. incerta</i> (Arango).
<i>U. angustior</i> (Wright).	<i>U. integra</i> (Pfr.).
<i>U. arcustriata</i> (Wr.).	<i>U. irrorata</i> (Gundl.).
<i>U. assimilis</i> (Arango).	<i>U. macra</i> (Wright).
<i>U. capillacea</i> (Pfr.).	<i>U. plumbea</i> (Wright).
<i>U. coerulans</i> (Poey).	<i>U. producta</i> (Gundl.).
<i>U. colorata</i> (Arango).	<i>U. sauvalleana</i> (Gundl.) [P V.].
<i>U. crenulata</i> (Gdl.).	<i>U. scabrosa</i> (Gundl.).
<i>U. crystallina</i> (Wright).	<i>U. thomsoni</i> (Arango).
<i>U. decolorata</i> (Gundl.).	<i>U. torquata</i> (Morel.).
<i>U. diaphana</i> (Wright).	<i>U. unguiculata</i> (Arango).
<i>U. discors</i> (Poey).	<i>U. ventricosa</i> (Gundl.) [P V.].
<i>U. fibrosa</i> (Gundl.).	<i>U. violacea</i> (Wright).
<i>U. jusiformis</i> (Wr.).	<i>U. wrighti</i> (Pfr.).
<i>U. garciana</i> (Wright).	

## Section AMPHICOSMIA Pils. &amp; Van.

Type *C. salleana* Pfr., Pl. XVIII, fig. 22.

Proposed for three San Domingo species in which the columella bears two spiral laminæ, both finely denticulate.

<i>U. salleana</i> (Pfr.).	<i>U. gracilicollis</i> (Auct.).
<i>U. hjalmarsoni</i> (Pfr.).	

Genus **BRACHYPODELLA** Beck, 1838.

In this genus the radula is more highly specialized than in *Urocoptis* and the shell generally less so, internal armature of the axis being entirely absent, or limited to a weak, scarcely noticeable, spiral fold above.

The geographic range of *Brachypodella* includes not only the territory occupied by *Urocoptis*, but surpasses it on all sides: in the Bahamas on the north, the Virgin group on the east, the whole Caribbean chain and northern border of South America on the south, and west and southwest is sparsely distributed over Central America and southeastern Mexico.

The distribution of the minor groups is suggestive. The Jamaican sections form a group by themselves characterized by the extremely aberrant dentition as well as the modified shells. The species of other islands and the mainland are decidedly less specialized,



and show but a small amount of variation in general appearance. The section *Strophina* has the dentition of typical *Brachypodella*.

Section BRACHYPODELLA s. s.

Type *B. antiperversa* Fér.

This subgenus has a less specialized radula and wider geographic range than the others. The species are all small, mainly quite slender forms, for the most part not exhibiting great variety of form; but two exceptions may be noticed: *B. brooksiana* of Cuba, and some related species, have the neck enormously drawn out; while in some of the continental forms there is a weak spiral lamina upon the pillar.

Continental Species: Tabasco and Yucatan to Venezuela.

<i>B. bourguignatiana</i> (Ancey).	<i>B. speluncæ</i> (Morel.).
<i>B. hanleyana</i> (Pfr.).	<i>B. speluncæ</i> var. <i>dubia</i> (Pils.).
<i>B. morini</i> (Morel.).	<i>B. subtilis</i> (Morel.).

Insular species: Curacao and Trinidad to Porto Rico.

<i>B. raveni</i> (Bld.). Curacao.	<i>B. pallida</i> (Gldg.). St. John,
<i>B. trinitaria</i> (Pfr.) [P V.]. Trinidad.	Tortola, St. Thomas, Porto Rico.
<i>B. costata</i> (Gldg.) [C F.]. Barbados.	<i>B. chordata</i> (Pfr.). St. Croix.
<i>B. antiperversa</i> (Fér.) [P V.]. Guadeloupe.	<i>B. portoricensis</i> (Pfr.). Porto Rico.
<i>B. collaris</i> (Auct.) [P V.]. Guadeloupe, Martinique.	<i>B. riisei</i> (Pfr.) [P V.]. Porto Rico.

Greater Antilles—Haiti.

<i>B. dominicensis</i> (Pfr.).	<i>B. smithiana</i> (Pfr.).
<i>B. gouldiana</i> (Pfr.).	<i>B. weinlandi</i> (Pfr.).
<i>B. obesa</i> (Weinl. & Mts.).	

Greater Antilles—Cuba.

<i>B. blainiana</i> (Gundl.).	<i>B. modesta</i> (Poey).
<i>B. brooksiana</i> (Gdl.) [C F., P V.].	<i>B. philippiana</i> (Pfr.).
<i>B. camoensis</i> (Pfr.).	<i>B. plicata</i> (Poey) [P V.].
<i>B. capillacea</i> (Pfr.).	<i>B. porrecta</i> (Gld.).
<i>B. cyclostoma</i> (Pfr.) [B., P V.].	<i>B. rugeli</i> (Shutt.).
	<i>B. scalarina</i> (Shutt.).



<i>B. gracillima</i> (Poey).	<i>B. scopulosa</i> (Gundl.).
<i>B. gundlachiana</i> (Poey).	<i>B. sexdecimalis</i> (Jien.).
<i>B. marmorata</i> (Shutt.).	<i>B. soluta</i> (Pfr.).
<i>B. minuta</i> (Gundl.).	<i>B. turcasiana</i> (Gundl.).

*Bahamas.*

*B. bahamensis* (Pfr.). New Providence, [C F., P V.].

## Section STROPHINA Mörch.

*B. laterradii* (Grat.) [P V.]. San Domingo.

## Section GEOSCALA Pils. &amp; Van.

Type *B. seminuda* (C. B. Ads.).

A Jamaican group similar to some *Brachypodellas* except in the dentition, which is of the highly evolved type seen in *Mychostoma*. The shell differs from this last group in being fusiform, fewer whorled and strongly costate.

<i>B. seminuda</i> (C. B. Ad.) [B., P V.].	<i>B. inornata</i> (C. B. Ad.).
<i>B. costulata</i> (C. B. Ad.).	<i>B. robertsi</i> (C. B. Ad.).

Subgenus *Mychostoma* Albers.

*Mychostoma* Alb., Die Hel. (edit. 1), p. 207. All species are Jamaican.

<i>B. agnesiana</i> (C. B. Ad.) [C F., P V.].	<i>B. alabastrina</i> (Pfr.).
<i>B. alba</i> (Ad.).	<i>B. pearmaniana</i> (Chitty).
	<i>B. subula</i> (Fér.) [B.].

Subgenus *Apoma* Beck.

*Apoma* Beck, Index Moll., p. 89.

*Casta* Alb., Die Hel., p. 208.

A very distinct group, containing two sinistral Jamaican species.

Type *Turbo elongatus* (Wood), Pl. XVIII, fig. 21.

Von Martens objects to the name *Apoma* because of its inapplicability as implying that other allied groups should be operculated; but it was obviously given to direct attention to the most conspicuous difference between this group and *Clausilia*, and from this point of view is eminently appropriate.

*B. gracilis* (Wood) [C F., S P.]. | *B. elongata* (Chemn.) [B., P V.].

Genus *ANOMA* Albers.

1850. *Anoma* Alb., Die Heliceen, p. 209, for *acus* Pfr., *gossei* Pfr., *tricolor* Pfr. (the last selected as type by von Martens, Die Hel. 2d edit., 1860, p. 269). Not *Anomus* Fairm. Hemiptera 1846.



1850. *Leia* Albers, Die Hel., p. 207. Sole species *L. maugeri* Wood. Not *Leia* Meigen in Diptera, 1818, nor Meg., Coleoptera, 1821.

1852. *Lia* Mörch, Catal. Yoldi, p. 35. Sole species *L. maugeri*. Not *Lia* Esch., in Coleoptera, 1829.

1869. *Inliaculus* Schaufuss, in Paetel's Moll. Syst. et Catal., p. 15.

1894. *Vendrysia* Simpson, Proc. U. S. Nat. Mus., xvii, p. 430. Substitute for *Leia*.

Distribution, Jamaica; mountains of the interior.

Of the several names proposed for this group, *Anoma* has priority. It has the disadvantage of being preceded by *Anomus*, which some writers would hold to be identical. Those adhering to this view will adopt the name *Inliaculus* of Schaufuss; but pending some concerted action upon this point in "nymology" the oldest name may be allowed to stand.

The dentition (Pl. XVII, figs. 3 and 6, *A. maugeri*) is extremely peculiar, differing from that of *Urocoptis* in having the cusps of the teeth serrate.

*A. maugeri*. (Wood).

*A. blandiana* (Pfr.).

*A. macrostoma* (Pfr.).

*A. zebrina* (Pfr.).

*A. tricolor* (Pfr.).

*A. gossei* (Pfr.).

Genus **MACROCERAMUS** Guilding.

1822. *Cochlodina*, Ire groupe, *Pupoides* Fér., Tabl. Systematique, p. 24, 61.

1828. *Macroceramus* Guilding, Zool. Journ., IV, p. 168. *M. signatus*.

1850. *Colobus* Alb., Die Heliceen p. 177. Not of Illiger, 1811, Merrian, 1820 (Rept.), or Serv., 1833 (Coleopt.).

For anatomy see Crosse & Fischer, Journ. de Conchyl., 1870, p. 20; Moll. Terr. Mex., I, p. 419. Binney, Terr. Moll., V, p. 384; Ann. N. Y. Acad., III, p. 126. Strebel & Pfeffer, Beitr. Mex. L. u. S.-W. Conch., IV, p. 89.

Preponderantly Antillean, this genus has representatives upon the mainland bordering the Gulf of Mexico from Venezuela to Florida. These peripheral species are apparently all members of the section *Microceramus*. In the West Indies the genus is present on nearly every island, but is especially developed in Cuba, to which *Spiroceramus* is confined. It is poorly represented in Jamaica by a few species of the group *Microceramus*, to which the species of the Bahamas likewise belong.



*Synopsis of subgenera.*

## I. Axis slender, straight and simple.

*a. Macroceramus.* Shell comparatively solid and large. Type *M. signatus* Gldg.

*a'. Microceramus* Pils. & Van., (n. s.-g.). Shell smaller, thin. Type *M. floridanus* Pils.

## II. Axis with a strong spiral lamina.

*Spiroceramus* Pils. & Van., (n. s.-g.). Dentition unknown. Type *M. amplus* Gundl.

Genus **PINERIA** Poey.

This small group, originally described from the Isle of Pines, but also occurring in several of the Caribbean Islands, is probably an offshoot of the genus *Macroceramus*. The peculiar features of the external anatomy described by Poey should be re-examined.

Genus **EPIROBIA** Strebel & Pfeffer, 1880.

*Epirobia* S. & P., Beitrag zur Kenntniss der Fauna mexikanischer Land- u. Süßwasser-Conchylien, Theil IV, pp. 77, 85.

Type *E. polygyra* Pfr. Pl. XVII, fig. 2 (dentition). For figure of the axis, see Strebel, *l. c.*, pl. 14, f. 14.

Many-whorled, slender species of Eastern Mexico, usually retaining the spire intact, differing from *Urocoptis* and *Brachypodella* in dentition and in the hollow axis. Notwithstanding the entirely "Cylindrella"-like aspect of the shell externally, these features unquestionably locate the group near *Holospira* and *Celocentrum*.

Strebel and Pfeffer referred all of the Mexican Cylindrellas to their group; but it must be restricted by removal of the forms with solid axis, which apparently belong to *Brachypodella*. In addition to the two species mentioned below, *E. berendti* Pfr. [S P.] belongs here, and probably *gassiesi* Pfr. and *swiftiana* Crosse also. The "*E. morini* Morelet," of Strebel & Pfeffer was incorrectly identified, and probably a form of *E. polygyra*.<sup>8</sup> The true *C. morini* is a *Brachypodella* with acutely keeled base.

*E. polygyra* Pfr. [S P., P V.].

*E. apiostoma* Pfr.

<sup>8</sup> Since this paper was written, this form has been referred by Dr. von Martens to *C. polygyrella* Mts. It is a true *Epirobia*.



Genus **HOLOSPIRA** von Martens.

This genus, which is confined to the mainland of Mexico and the adjacent States of the Union, offers an interesting series of structures in the internal lamellæ, parallel to those of *Urocoptis*. The principal divergence from that genus is in the frequent development of parietal and basal lamellæ, which are of rare occurrence in the Antillean genera.

Professor Dall,<sup>9</sup> who has ably investigated the subject, gives the following classification, which seems worthy of unqualified approval:—

Subgenus **HOLOSPIRA** s. s., type *N. pilocerei* Pfr., with section *Bostrichocentrum* Strebel & Pfeffer, *Haplostemma*, *Eudistemma* and *Distomospira* Dall.

Subgenus **METASTOMA** Strebel & Pfeffer, type *H. roemeri* Pfr.

Subgenus **CÆLOSTEMMA** Dall, type *H. elizabethæ* Pilsbry.

The first group includes species with an axial plait and usually various other armature. More or less similar structures occur in *Gongylostoma*. *Metastoma* has the axis simple, as in typical *Urocoptis* and *Brachypodella*. In *Cælostemma* a swollen, vertically costulate axis is found, unlike any Antillean type, although there is some analogy with the subgenus *Idiostemma* Pils. & Van.

Genus **EUCALODIUM** Crosse & Fischer.

In this Mexican genus the large, solid shell resembles typical *Urocoptis*; the axis is solid and sinuous, with a continuous spiral plait, as in the subgenus *Arangia* P. & V., of *Urocoptis*.

The subgenus *Oligostylus* Pils.<sup>10</sup> has the axis straight and smooth, as in typical *Urocoptis*.

These two types of pillar are exactly paralleled also in the genus *Macroceramus* Gldg. and its subgenus *Spiroceramus* Pils. & Van.

Subgenus **Anisospira** Strebel & Pfeffer.

An eastern Mexican group, of few species. The soft anatomy is still unknown. It seems to be a subgenus subordinate to *Eucalodium*.

Genus **BERENDTIA** Crosse & Fischer.

Like *Spartocentrum*, to which it is closely allied; but with the axis solid, slender and smooth, and the spire tapering, with fewer, more

<sup>9</sup> Proc. U. S. National Museum, xix, p. 344, 1896.

<sup>10</sup> See Dall, The Nautilus IX, p. 51; Proc. U. S. Nat. Mus. XIX, p. 348.



rapidly widening whorls. The only species, *B. taylori* Pfr., inhabits the table land of Lower California.

Genus **CÆLOCENTRUM** Crosse & Fischer.

The hollow and usually vertically ribbed axis is unlike any of the Antillean types, although radiating spines, such as Dall describes in *C. astrophorea*, recall certain forms of *Gongylostoma*. In the section *Spartocentrum* Dall<sup>11</sup> there is a spiral inflation and no vertical riblets.

Genus **CERION** (Bolt.) Mörch.

See Proc. Acad. Nat. Sci. Phila., 1896, p. 315.

This genus has generally been placed in the neighborhood of *Pupa*, but it is not closely allied to that group in shell characters and is entirely diverse in genitalia. It may possibly belong to the *Odontostominae* (*Odontostomus*, *Tomigerus*, *Anastoma*) of South America; but we prefer to associate Cerion with the *Holospira* and *Eucalodium* groups of *Urocoptidae*.<sup>12</sup>

As this genus has been made the subject of special papers by Dr. W. H. Dall and by the present writers, it need only be said here that it differs from the other genera in being strictly littoral in distribution, never straying far from the sea shore. The Miocene forms (*Eostrophia*) are probably aberrant rather than primitive, in lacking parietal and axial laminæ.

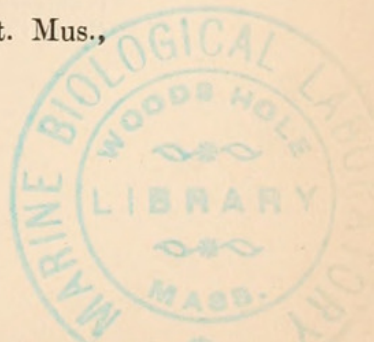
Genus **MEGASPIRA** Lea.

A Brazilian group very peculiar in its polygyrate shell with large, rounded nuclear whorls, plicate columella and peculiar internal armature, somewhat recalling *Gongylostoma*, *Idiostemma*, etc. This has been described and figured by Gabb.<sup>13</sup> The dentition we have now examined (Pl. XVII, fig. 1), the radula having been found in a dry shell. There are 28·1·28 teeth, arranged in slightly sinuous transverse rows, and of the type usual in ground snails, much like those of *Eucalodium*, *Berendtia*, etc.

<sup>11</sup> See Nautilus IX, p. 51 (Sept., 1895), type *Cælocentrum irregulare* Gabb. The genus *Teneritia* Mabile, Bull. Soc. Philomathique de Paris, (Ser. 8), Vol. IX, p. 79 (1897 or 1898) is a synonym of *Spartocentrum*. Types *Berendtia digueti* and *B. minorina* Mabile. M. Mabile is perfectly right in separating his group from *Berendtia*, but he overlooks the only really important differential character, viz., the hollow axis.

<sup>12</sup> Dall has hinted at the same relationship. See Proc. U. S. Nat. Mus., XIX, p. 347, 348, 1897.

<sup>13</sup> American Journal of Conchology II, p. 64.





*Megaspira* was placed in the vicinity of *Clausilia* by Deshayes, who thought the internal structure indicated the presence of a clausilium. This inference does not seem justified by the facts of the case, though we are far from denying its possibility; our specimen with the soft parts dried in shows no trace of a clausilium. Upon the whole, it would appear that *Megaspira* is an aberrant member of the *Urocoptidæ*, nearest perhaps to *Eucalodium* among existing genera.

The South African genus *Cælaxis* and the Papuan and Australian *Perrieria* are somewhat similar to the foregoing American genera, but are doubtless correctly referred to *Pupidæ*, near *Clausilia*. *Perrieria* has a complicated internal armature, only partially worked out by Fischer.

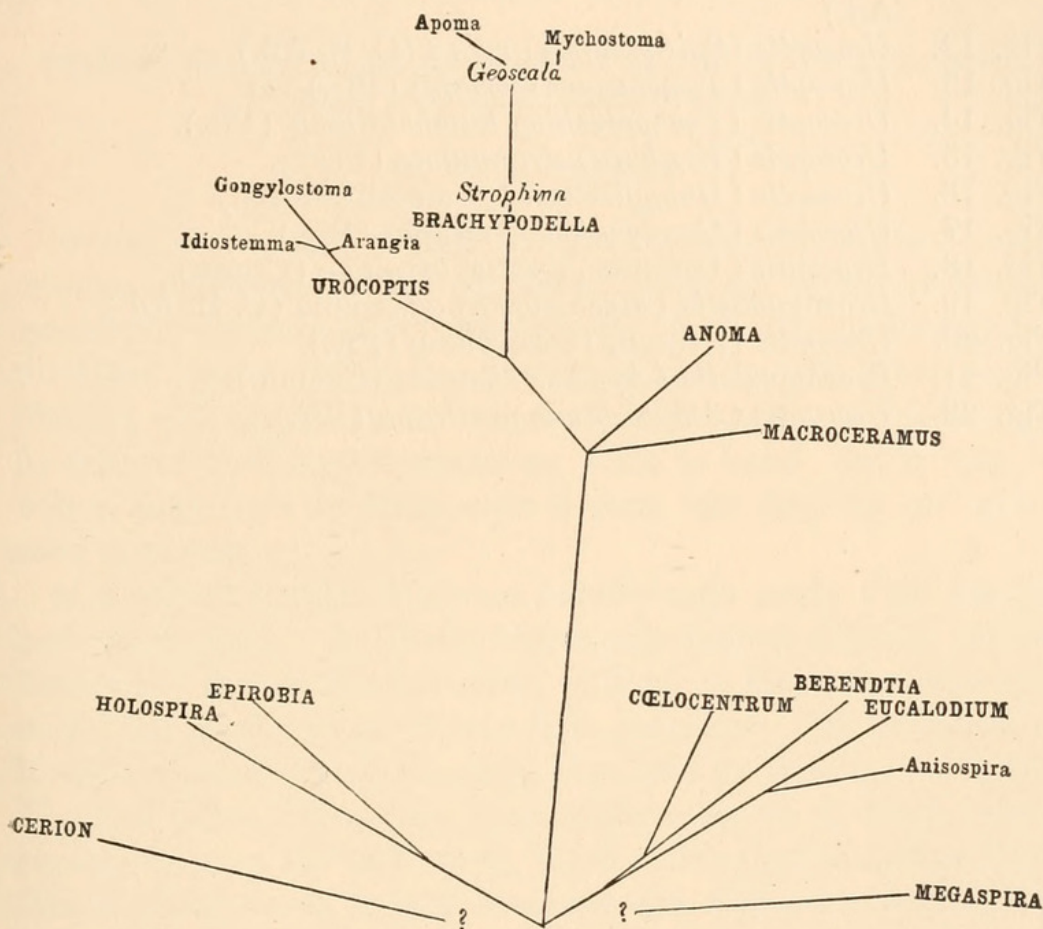
The Colombian *Rhodea* is probably referable to the *Achatinidæ*, grouping near *Subulina* Beck (type *S. octona*).

TABLE SHOWING GEOGRAPHIC DISTRIBUTION OF THE UROCOPTIDÆ.

	Northern South America.	Lower California.	Mexico, Central America.	Caribbean Is.	Porto Rico, Virgin Is.	Haiti.	Jamaica.	Cuba.	Bahamas.	S. Florida.
Genus UROCOPTIS.....	-	-	-	-	-	*	*	*	-	*
Section <i>Urocoptis</i> (restricted)...	-	-	-	-	-	*	*	*	-	*
Section <i>Cochlodinella</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Spirostemma</i> .....	-	-	-	-	-	*	*	*	-	*
Subgenus <i>Arangia</i> .....	-	-	-	-	-	*	*	*	-	*
Subgenus <i>Idiostemma</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Maceo</i> .....	-	-	-	-	-	*	*	*	-	*
Subgenus <i>Gongylostoma</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Pycnoptychia</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Callonia</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Sectilumen</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Esochara</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Gongylostoma</i> (s. s.)....	-	-	-	-	-	*	*	*	-	*
Section <i>Amphicosmia</i> .....	-	-	-	-	-	*	*	*	-	*
Section <i>Tomelasmus</i> .....	-	-	-	-	-	*	*	*	-	*
Genus BRACHYPODELLA.....	*	-	*	*	*	*	*	*	*	-
Section <i>Brachypodella</i> (s. s.)...	*	-	*	*	*	*	*	*	*	-
Section <i>Strophina</i> .....	-	-	-	-	-	*	*	*	-	-
Section <i>Geoscala</i> .....	-	-	-	-	-	*	*	*	-	-
Section <i>Mychostoma</i> .....	-	-	-	-	-	*	*	*	-	-
Section <i>Apoma</i> .....	-	-	-	-	-	*	*	*	-	-
Genus EPIROBIA.....	-	-	*	-	-	-	*	-	-	-
Genus HOLOSPIRA.....	-	-	*	-	-	-	*	-	-	-
Genus MACROCERAMUS.....	-	-	*	*	*	*	*	*	*	*
Genus ANOMA ( <i>Lia</i> ).....	-	-	*	*	*	*	*	*	*	*
Genus EUCALODIUM.....	-	-	*	-	-	-	*	-	-	-
Genus COELOCENTRUM.....	-	*	*	-	-	-	-	-	-	-
Genus BERENDTIA.....	-	*	-	-	-	-	-	-	-	-
Genus CERION.....	Cura- cao.	-	-	-	*	*	-	*	*	*



SUGGESTED PHYLOGENY OF THE GENERA AND PRINCIPAL  
SUBGENERA OF UROCOPTIDÆ.



EXPLANATION OF PLATES.

PLATE XVII.

- Fig. 1. *Megaspira elata* Gld. Half of a transverse row of teeth (the outermost marginals placed above, to the left).  
 Fig. 2. *Epirobia polygyra* (Pfr.). The same, a few outermost marginal teeth lacking.  
 Fig. 3. *Anoma maugeri* (Wood). Group of teeth from the median part of the radula.  
 Fig. 4. *Brachypodella* (*Apoma*) *elongata* (Ch.). Half of a transverse row of teeth.  
 Fig. 5. *Urocoptis cylindrus* (Ch.), very small variety from Portland, Jamaica. Half of a transverse row of teeth.  
 Fig. 6. *Anoma maugeri* (Wood). A lateral tooth seen in profile.  
 Fig. 7. *Urocoptis* (*Maceo*) *interrupta* (Gundl.). Section of shell.  
 Fig. 8. *Urocoptis* (*Tomelasmus*) *torquata* (Morel.). Section of shell.  
 Fig. 9. *Urocoptis* (*Sectilumen*) *ornata* (Gundl.).  
 Fig. 10. *Urocoptis* (*Idiostemma*) *uncata* (Gundl.).



## PLATE XVIII.

- Fig. 11. *Urocoptis cylindrus* (Chemn.) (*C. rosea* var. *major* C. B. Ad.).  
Fig. 12. *Urocoptis* (*Spirostemma*) *rubra* (C. B. Ad.).  
Fig. 13. *Urocoptis* (*Tomelasmus*) *wrighti* (Pfr.) var.  
Fig. 14. *Urocoptis* (*Pycnoptychia*) *humboldtiana* (Pfr.).  
Fig. 15. *Urocoptis* (*Esochora*) *strangulata* (Poey).  
Fig. 16. *Urocoptis* (*Gongylostoma*) *pruinosa* (Morel.).  
Fig. 17. *Urocoptis* (*Gongylostoma*) *elegans* (Pfr.).  
Fig. 18. *Urocoptis* (*Callonia*) *dautzenbergiana* (Crosse).  
Fig. 19. *Brachypodella* (*Mychostoma*) *agnesiana* (C. B. Ad.).  
Fig. 20. *Urocoptis* (*Arangia*) *sowerbiana* (Pfr.).  
Fig. 21. *Brachypodella* (*Apoma*) *elongata* (Chemn.).  
Fig. 22. *Urocoptis* (*Amphicosmia*) *salleana* (Pfr.).





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