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SMITHSONIAN MISCELLANEOUS COLLECTIONS.

CLASSIFICATION

OF THE

COLEOPTERA

OF

NORTH AMERICA.

PREPARED FOR THE SMITHSONIAN INSTITUTION.

BY

JOHN L. LECONTE, M. D.

PART I.

WASHINGTON:
SMITHSONIAN INSTITUTION.
MAY, 1861—MARCH, 1862.

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ADVERTISEMENT.

THE present work is one of a series to be published by the Smithsonian Institution for the purpose of facilitating the study of certain branches of the Natural History of North America which appear to require special aid. It has been prepared, at the request of the Institution, by Dr. LeConte, to whom science is much indebted for thus devoting his time to the preparation of an elementary book, intended to introduce others to a field in which he has himself been so successful a pioneer.

JOSEPH HENRY,
Secretary S. I.

SMITHSONIAN INSTITUTION,
WASHINGTON, May, 1861.

The preceding advertisement was written and published with page 1—208, in May, 1861. Since then, pages 209—278, completing Part I of the present work, have been prepared and are now published.

The second and concluding part of the work will contain the families embraced in the divisions Tetramera and Trimera of the older authors. Some time will, however, necessarily elapse before it can be prepared by Dr. LeConte.

J. H.

February, 1862.

ACCEPTED FOR PUBLICATION, OCTOBER, 1860.

PHILADELPHIA:
COLLINS, PRINTER.

PREFACE.

THE science of Entomology, in this country, is to a very considerable degree traditional. The series of specimens which are arranged and named have assumed their scientific value entirely from the labors of four or five individuals, who, from peculiarly favorable circumstances, have been enabled to lay a groundwork for scientific investigation by conference or correspondence with European students.

The present small treatise, prepared at the request of the Smithsonian Institution, is intended, so far as relates to the determination of genera of Coleoptera, to obviate the necessity for this traditional knowledge, and to enable those who have a desire beyond that of the mere collection of specimens to acquire sufficient information to enable them to consult with profit the various works in which are found scattered the descriptions of our species.

At the same time it is designed to present in as compact a form as possible the most recent results of scientific analysis, as applied to the classification of those genera of Coleoptera which have been found in that portion of America north of Mexico. In presenting these results, I have by no means adhered to the opinions expressed by those who have previously written on the classification of the order of insects which will occupy our attention; but where it has seemed to me possible to change with advantage the schemes already proposed, I have not hesitated to alter them.

The work is, therefore, intended for two classes of persons—for those *who wish* to obtain a knowledge of this branch of science, and for those who have already acquired that knowledge, and who now occupy the position of investigators.

The first class, or beginners, will here find the elementary

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results obtained from a long course of reading and the observation of abundant materials. A knowledge of these results will enable them to understand the more special memoirs which they will find it necessary to use in the prosecution of their future studies, and eventually to correct any errors which are contained in the present treatise. The second class, or investigators, will find herein certain views proposed for their adoption, which, with the material afforded by our fauna, seem to the author to be preferable to those presented in previous works. Many of the presumed improvements will no doubt be rejected, but it is hoped that at all events they will help, like those which have gone before them, to establish a basis for future progress.

Bibliographical references have been avoided in the body of the work; they would increase considerably the size, without rendering the work more useful. The beginner does not need them; the investigator knows where to find them in more general works.

I have derived great aid in the preparation of this work from the Genera des Coléoptères, by my learned friend Prof. Th. Lacordaire, and from the Genera des Coléoptères d'Europe, by Jacquelin du Val, both admirable works, which, except in some very intricate cases, render any reference to the earlier authors on the subject of genera almost unnecessary.

In conclusion, I would repeat that the present work is not expected to inspire any one with a love for this branch of Entomology, but to satisfy, so far as I am able, the desires which have arisen in the minds of those in whom the sacred fire of science has already been kindled.

JOHN L. LECONTE.

PHILADELPHIA, April, 1861.

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INTRODUCTION.

THE articulate branch of the animal kingdom contains animals composed of simple rings, more or less similar to each other, which contain and support the organs necessary to animal life.

According to the method in which this plan of structure is exemplified, articulate animals are divided into three classes :—

Body permeated by air vessels.	INSECTA.
Body without air vessels ;	
Thoracic region distinct from abdominal.	CRUSTACEA.
Thoracic region not distinct.	VERMES.

The class Insecta are again divided by subordinate modifications in the plan of structure into three sub-classes :—

Head, thorax and abdomen distinct, legs 6.	INSECTA.
Head and thorax usually agglutinated, legs 8.	ARACHNIDA.
Head distinct, legs numerous.	MYRIAPODA.

The first sub-class Insecta (genuina) alone occupy our attention at present.

In examining the transformations of those which pass from a larval form, which is very different from the adult, we find that the changes may be grouped as follows :—

1. Greater concentration of the central organs, and diminution of the number of external segments.
2. Greater complication of the peripheral organs.
3. Hardening of the integument.

We also find that certain forms, when hatched from the egg, resemble in appearance the parent, and finally assume the characters of the adult after growth, and repeated changes of skin. In others the individual emerging from the egg bears no resemblance to the adult, but after growth, accompanied with several changes of skin, passes into a condition in which a body similar to that of

Legs short, stout; thighs broad, compressed; tarsi 5-jointed, with the first three joints hairy beneath, and more or less dilated, the fourth very small, fifth moderate; claws with a basal tooth.

A small number of oval or rounded oval, convex, shining insects constitute this family. They are found on flowers, and sometimes under bark. The elytra have sometimes approximate rows of small punctures, but more usually only a sutural stria. The scutellum is larger than usual, triangular. One of the four genera (Tolyphus) of this family is wanting in our fauna. The other three are separated by the form of the posterior tarsi.

Anterior and posterior tarsi of the same length (tibiæ without spurs). PHALACRUS.

Posterior tarsi elongated (tibiæ with distinct spurs);
- First joint of posterior tarsi shorter than the second. OLIBRUS.
- First joint of posterior tarsi longer. LITOCHRUS.

FAM. XV.—NITIDULIDAE.

Mentum transverse, subquadrate, composed of two pieces closely united together, frequently rounded, sometimes sinuate or emarginate in front.

Maxillæ usually exposed, rarely covered at the base; usually with only one lobe, the outer lobe being wanting; but in the first tribe the outer lobe is distinct.

Antennæ inserted under the margin of the front, 11-jointed (the eleventh indistinct in Rhizophagus), terminated by a round or oval club, composed of three, rarely of two joints.

Prothorax sometimes closely applied to the elytra, sometimes passing over their base; prosternum frequently produced behind, side pieces not distinct; coxal cavities open or closed.

Mesosternum separating the middle coxæ, side pieces with the epimera large, extending to the coxæ.

Metasternum short, side pieces narrow, epimera not visible.

Elytra sometimes truncate, sometimes entire.

Abdomen with five free ventral segments, the first a little longer, widely produced between the posterior coxæ.

Anterior coxæ transverse, separated, not prominent; middle and posterior ones transverse, flat, distant, the latter extending almost to the margin of the body.

Legs short, somewhat stout, retractile, or subretractile;

tarsi short, dilated (except in some genera of the third tribe), hairy beneath, usually 5 jointed, with the fourth joint very small; the posterior of the males of the sixth tribe 4-jointed, and in the foreign genus Cybocephalus all the tarsi 4-jointed.

The species of this family are usually oval, depressed, or slightly convex, but sometimes almost globular, sometimes elongate; they live on decomposing substances, both animal and vegetable. The head is suddenly narrowed before the antennæ, forming a short beak; the antennæ are retractile, and their basal joints frequently pass into grooves under the eyes.

Six tribes compose this family, and are all represented in our fauna.

A. Antennæ with eleven distinct joints, club 3-articulate;
  Labrum distinct; epistoma not prolonged;
    Two or three dorsal segments of the abdomen exposed;
      Maxillæ with two lobes. BRACHYPTERINI.
      Maxillæ with one lobe. CARPOPHILINI.
    The last dorsal segment (pygidium) alone exposed;
      Prothorax not covering the base of the elytra. NITIDULINI.
      Prothorax covering the base of the elytra. CYCHRAMINI.
  Labrum concealed by the epistoma, which is prolonged. IPINI.
B. Antennæ apparently 10-jointed, club solid. RHIZOPHAGINI.

Tribe I.—BRACHYPTERINI.

The species composing this tribe are few in number, found on flowers, and are more convex than those of the next tribe. Besides the characters above specified, the anterior coxal cavities are not closed behind, the tarsi are 5-jointed in both sexes, and the prosternum is not prolonged behind the posterior coxæ. No antennal grooves are seen below the eyes, and by this character the genera may be distinguished from all of those of the next tribe which occur in our fauna. The two genera are:—

Ungues simple. CERCUS.
Ungues toothed at the base. BRACHYPTERUS.

The males of the last genus have a small apical dorsal segment.

Tribe II.—CARPOPHILINI.

The species of this tribe are usually flattened, though some of the species of Carpophilus are moderately convex. They are known (at least our genera) from those of the first tribe by the head having beneath the eyes two converging grooves for the reception

of the basal joints of the antennæ, and from those of the following tribe by two or three dorsal segments of the abdomen being visible behind the elytra; in Carpophilus and Conotelus the males have a small dorsal sixth segment. The ungues are simple. The species live some on flowers, some under bark.

Ventral segments 1—4 short, fifth as long as the others united. COLASTUS.
Ventral segments 1—3 short, fourth and fifth long. TRIBRACHYS.
Ventral segments 2—3 short, first, fourth, and fifth longer. CARPOPHILUS.
Ventral segments 1—2 short, 3—4 elongate, fifth elongate, conical. CONOTELUS.

The last genus has an elongate form, and resembles certain Staphylinidæ.

Tribe III.—NITIDULINI.

Elliptical, usually depressed, and frequently widely margined species; sometimes moderately convex, and even (Pocadius) rounded. Distinguished from the previous tribes by the elytra covering the entire abdomen, or leaving only the pygidium exposed, and from the next by the thorax not being movable over the base of the elytra. All of our genera have antennal grooves on the under surface of the head.

These insects live on flowers (Meligethes), in fungi (Pocadius), under bark and stones (Epuræa), or on dried animal matter.

Our genera are as follows:—

A. Prosternum not prolonged behind the anterior coxæ, dilated, rounded, or truncate;
  a. Antennal grooves converging behind, remote from the eyes;
    Mentum not covering the base of the maxillæ;
      Last joint of labial palpi large, thick; males with a small sixth dorsal segment. EPURÆA.
      Last joint of labial palpi not thicker than the preceding, males with no distinct sixth dorsal segment. NITIDULA.
    Mentum covering the base of the maxillæ. PROMETOPIA.
  b. Antennal grooves diverging behind, following the outline of the eyes;
    First joint of antennæ large, broadly dilated. LOBIOPA.
    First joint of antennæ moderate;
      Males without a sixth dorsal segment. OMOSITA.
      Males with a sixth dorsal segment;
        Middle and posterior tarsi not dilated. PHENOLIA.
        All the tarsi dilated. STELIDOTA.
B. Prosternum prolonged behind the anterior coxæ;
    All the tarsi dilated. MELIGETHES.
    Posterior tarsi not dilated (elytra deeply striate). PSILOPYGA.
    None of the tarsi dilated (elytra scarcely truncate). POCADIUS.

The genus Psilopyga is remarkable for its close resemblance, in appearance, to Hister.

Tribe IV.—CYCHRAMINI.

The species of this tribe are rounded or oval, convex insects, living in fungi. One genus (Cybocephalus *Er.*), not yet found with us, has the power of contracting into a ball, like Agathidium and Clambus, from which it will be distinguished by the anterior coxæ not being prominent.

I. All the tarsi equal in length;
  Tarsi all dilated; prosternum scarcely produced. CYCHRAMUS.
  Hind tarsi not dilated. AMPHICROSSUS.
II. Hind tarsi elongated; prosternum but slightly produced. PALLODES.

Tribe V.—IPINI.

The species of this tribe are oblong, sometimes elongate species, usually prettily variegated with red spots on the elytra. They are readily known by the epistoma being prolonged between the mandibles; the elytra of Cryptarcha are rounded, of Ips and Pityophagus are truncate. The species live upon fungi and under bark.

Prosternal prolongation reaching the metasternum; first joint of antennæ covered by the front; body oval, pubescent. CRYPTARCHA.
Prosternal prolongation not reaching the metasternum; body glabrous;
  Head immersed in the thorax to the eyes; no sixth abdominal segment in the males; body oblong, rarely elongate. IPS.
  Head not immersed as far as the eyes; males with a sixth abdominal segment; body elongate, subcylindrical. PITYOPHAGUS.

The species of the last genus entirely resemble in form those of the next tribe, but are distinguished by the antennal club, composed of three joints.

Tribe VI.—RHIZOPHAGINI.

Small cylindrical or slightly flattened species, having the club of the antennæ solid and composed of the tenth joint, the eleventh being closely connate with it; the labrum, as in the preceding tribe, is concealed by the prolonged epistoma; the elytra are truncate, leaving the pygidium exposed; the anterior coxal cavities are entirely closed, while in most of the genera of the preceding tribes they are open behind; the posterior tarsi are 4-jointed in

the males, 5-jointed in the females; the males have also a sixth dorsal segment. They are found under bark. One genus, Rhizophagus, constitutes the tribe, and is represented on both sides of the continent.

Fam. XVI.—MONOTOMIDAE.

Mentum moderate, subquadrate, rounded or subangulated in front; ligula partly corneous, prominent; labial palpi short, 3-jointed, first joint very small.

Maxillæ exposed at the base, with two lobes, the outer one long, slender, scarcely ciliate at tip, the inner one larger, ciliate internally and at the tip; maxillary palpi 4-jointed, the first joint very short.

Eyes strongly granulated, rounded.

Antennæ inserted under the sides of the front, behind the mandibles, 10-jointed, the last one or two joints forming a club.

Head tolerably large, flat, suddenly but slightly constricted behind; front broadly lobed between the mandibles, which are short, acute, and fringed with membrane internally; labrum very short, not distinct; mandibles short, robust, acute at tip, with a small subapical tooth; internal margin fringed with hair.

Prothorax with the side pieces not separate, prosternum entire, coxal cavities small, broadly closed behind.

Mesosternum short, emarginate behind; side pieces large, diagonally divided; epimera attaining the coxæ

Metasternum large, side pieces narrow.

Elytra truncate behind, leaving the last dorsal segment exposed.

Abdomen with five free ventral segments, the first and fifth elongated.

Coxæ, anterior small, rounded, separated; middle rounded, separated by the sternum; posterior transverse, separated.

Legs moderate; tibiæ nearly linear, with distinct terminal spurs, and a few small spines about the tip; tarsi 5-jointed, the joints 1—3 slightly dilated, and covered beneath with long hair, the fourth narrower and smaller, the fifth longer than the others united, with simple ungues.

Small, depressed insects, found mostly under bark of trees. They resemble closely in characters and appearance the tribe

Rhizophagini of Nitidulidæ, and, like them, the males have a small terminal dorsal segment; the form of the anterior coxæ at once separates them from all Nitidulidæ.

The genera are:—

Antennæ with the ninth and tenth joints enlarged;
  Ninth joint of the antennæ as wide as the tenth;
    Sides of the head slightly dilated before the eyes; surface finely punctured and pubescent. PHYCONOMUS.
    Sides of the head not dilated; body glabrous, coarsely punctured; elytra punctured in striæ. NOMOPHLŒUS.
  Ninth joint of the antennæ not as wide as the tenth; body coarsely punctured; elytra punctured and pubescent in striæ. HESPEROBÆNUS.
Antennæ with the ninth joint scarcely larger than the eighth;
  Head short; body sparsely, coarsely punctured; elytra punctured and pubescent in striæ. BACTRIDIUM.
  Head long; body irregularly, densely punctured. MONOTOMA.

The type of Phyconomus is *Monotoma marinum* Lec.;* it is found in California, under decaying kelp on the sea-shore.

Nomophlœus is founded on *N. pallipennis* Lec., a small reddish-brown insect, 11 inch long, found in Pennsylvania. The elytra are pale, with the suture and tip dusky. The head and thorax are sparsely punctured; the latter is quadrate, scarcely serrate on the sides, with a broad smooth dorsal vitta, limited behind by a curved impression.

Hesperobænus contains *Monotoma rufipenne* Lec.† from California, and a nondescript from the Atlantic States. *Rhizophagus capito* Fairemaire, from Honolulu, also belongs to it.

Bactridium comprises *Rhizophagus nanus* Er. from the Atlantic States, and *Monotoma striatum* Lec.‡ from the Colorado Desert.

FAM. XVII.—TROGOSITIDAE.

Mentum transverse, subquadrate; ligula small, corneous.

Maxillæ with two lobes, the inner one sometimes very small; palpi short, 4-jointed.

Eyes usually reniform (divided in some foreign genera).

Antennæ inserted under the frontal margin, 11-jointed, rarely 10-jointed (in some foreign genera); the last three joints widened, forming a loose club, of varied form.

* Proc. Acad. Nat. Sciences, Philad., 1858, p. 64.
† Ibid., p. 64. ‡ Ibid., p. 65.

Prothorax not passing over the base of the elytra; side pieces not distinct; coxal cavities closed in the first and third sub-families, usually open behind in the second; prosternum separating the coxæ (except in Peltastica).

Mesosternum separating the coxæ, side pieces extending to the coxæ.

Metasternum emarginate behind, for junction with the first ventral segment; side pieces long, narrow; epimera not visible.

Elytra never truncate, always covering the abdomen.

Abdomen with five free ventral segments.

Anterior coxæ transverse, separated, and not prominent (except in Peltastica); middle and posterior ones transverse, flat (except in Peltastica), the former separated, the latter rarely contiguous.

Legs moderate; tarsi 5-jointed, not dilated; joints 1—4 with a brush of hair beneath; first joint very short, second usually slightly elongated, last joint very long; claws simple, with a broad but short bisetose onychium.

The insects of this family were classed by Erichson with Nitidulidæ, but, as very properly observed by Lacordaire, although the characters are mostly the same as in that family, the different plan of structure in the maxillæ and tarsi is sufficient to mark them as a distinct family.

The species live under bark; but some Trogositæ are found in houses, living on grain, by the transportation of which they have been distributed over the entire globe.

Of the four recognized tribes of this family but two are found in our fauna; I consider them as indicating sub-families, and I have added a third for the anomalous genus Peltastica.

Anterior coxæ separate, not prominent;	
Internal lobe of the maxillæ unarmed.	TROGOSITIDÆ.
Internal lobe of the maxillæ armed with a corneous hook.	PELTIDÆ.
Anterior coxæ prominent, contiguous.	PELTASTICIDÆ.

Sub-Family I.—TROGOSITIDAE (genuini).

Elongate insects, having the thorax narrowed posteriorly, and somewhat distant from the elytra; the epistome is trisinuate or emarginate in front; the last three joints of the antennæ form a loose club, usually dentate internally; they are 11-jointed, except