

STUDIES IN THE WOODWASP SUPERFAMILY ORYSSOIDEA, WITH DESCRIPTIONS OF NEW SPECIES.

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INTRODUCTION.

In arranging the collection of Oryssidæ, of the United States National Museum and the branch of forest insects, Bureau of Entomology, a few apparently new species were encountered. In describing these insects it was deemed advisable to bring together all the available information concerning the habits and to present such systematic notes as were necessary. The following paper can only be treated as a preliminary outline and will have to be revised when more material is available and more definite information has been secured.

This paper is a contribution from the branch of forest insects of the Bureau of Entomology of the United States Department of Agriculture.

HABITS.

Very little is known about the habits of the Oryssidæ. The adults are very active, and are found on posts and near the wood of dead trees. They have been found on trunks of coniferous trees, on maple trees, on timber, and on various posts. They are active, and run and jump or fly short distances, reminding one of certain Chalcid flies. Very little definite information can be obtained about the larvæ, although it is generally believed that they are internal feeders in wood. It has even been suggested¹ that the insects are parasitic, but this has not been proven. Nothing has been published concerning the larvæ of the American species, except an apparently erroneous statement by Glover (1877) in which it is stated that "the larvæ bore in the wood of the willow." More has been published concerning the European species. Wachtl (1882) bred *Oryssus abientinus* from *Alnus incana* at the same time that he bred the beetle *Dicerca alni*. Rudow (1909) says that the same species occurs solitary on

¹ Harrington, 1893, p. 151.

white birch in connection with *Xiphydria*. Gaulle (1906) gives the host plants of the common European species as *Fagus sylvatica* and *Alnus incana*. Konow (1902) records the same species from *Fagus sylvatica* and says the larvæ are smaller than those of *Tremex*. Unfortunately, in the table of larvæ nothing is said of *Oryssus*, so we do not know if its larval characters are the same as those of *Tremex* or not. For America we have an observation made by A. D. Hopkins which seems to confirm the theory that *Oryssus* is parasitic. An Oryssid pupa was found in an old mine of a Cerambycid (see p. 156). Did this insect crawl in the Cerambycid mine to pupate? If so, where did it spend its larval period? Or, was the Oryssid parasitic on the Cerambycid?

GEOGRAPHICAL DISTRIBUTION.

The Oryssidae are so rare and their habits so imperfectly known that it is very difficult to map their distribution. If we knew the host plants, or knew that they are restricted to certain host plants, we could plot their distribution with more assurance. From the accompanying maps (pls. 32-33) it will be seen that as a superfamily they are found in all of the major regions, but singularly are absent in Palæartic 3 and 4¹; Oriental 1, 2, and 3; Australian 4; and Æthiopian 4. The Nearctic and Palæartic (1 and 2) have only the genus *Oryssus*, but this genus is also represented in the Neotropical and Australian regions. The Neotropical region has the genera *Oryssus* and *Ophrynopus*. The Æthiopian has *Chalinus*, and recently a species of *Oryssus* has been added. The Oriental (4) has the two genera *Mocsarya* and *Stirocorsia*. The Australian has representatives of *Oryssus* and *Ophrynopus*.

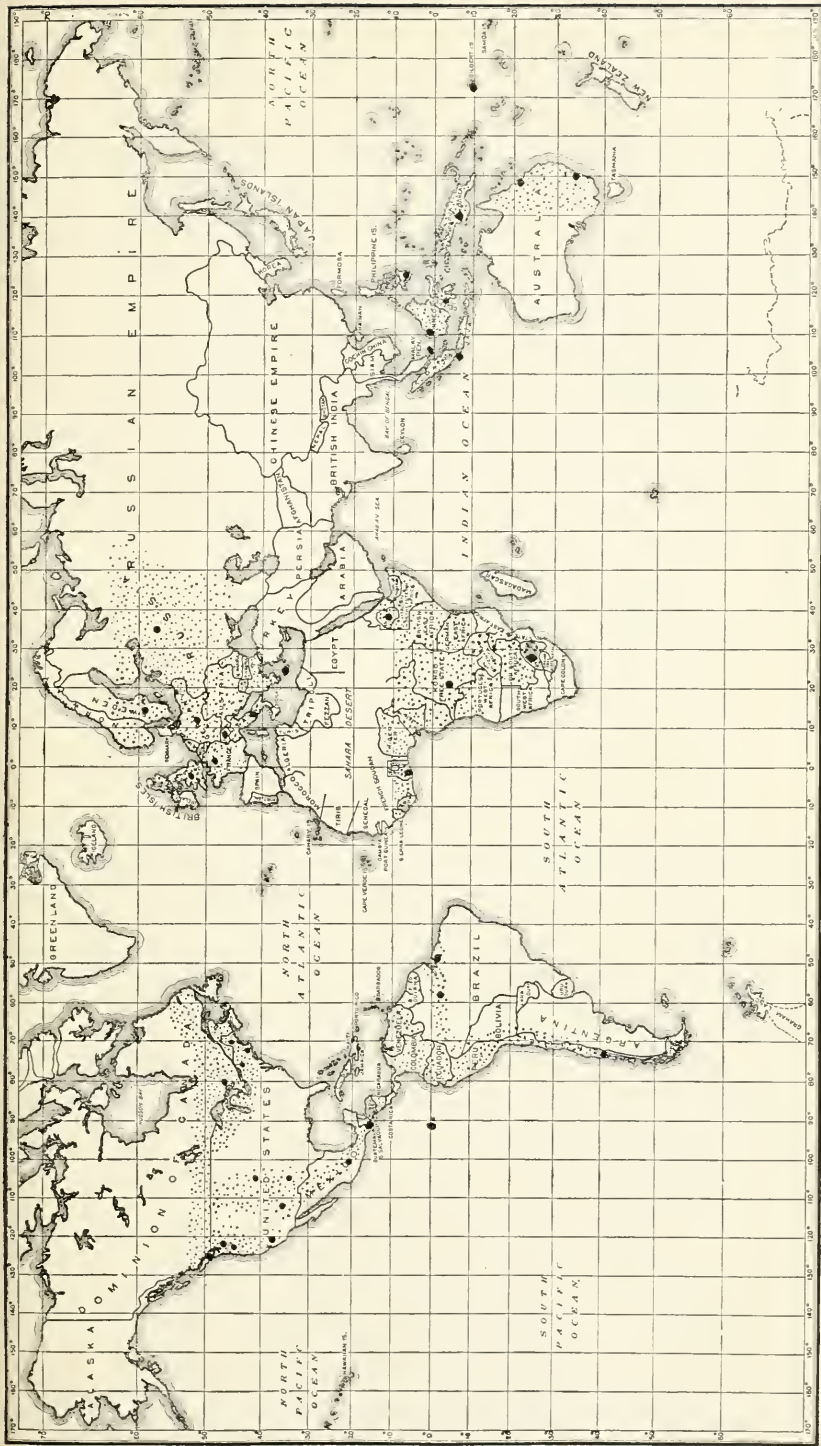
EXTERNAL ANATOMY.

Head.—Seen from in front, the head is transversely oval; the eyes large, converging toward the vertex; malar space large;² ocelli present, the lateral ones close to the inner margins of the eyes and in some specimens somewhat imperfect; posterior orbits narrower below; vertex tuberculate; front with or without carinæ; clypeus consolidated with the front; antennæ inserted in a groove above the base of the mandibles; labrum small, free, present between the bases of the mandibles; mandibles small, stout, broad apically and more or less dentate; antennæ in the female 10-jointed, with the ninth joint large and the apical one small, slender in the male 11-jointed, and of the normal type; maxillary palpi long, slender, 5-jointed; labial palpi short, clavate, 3-jointed.

The head of the Oryssidae is very specialized, and as yet, not thoroughly understood. It seems probable that the clypeus may be con-

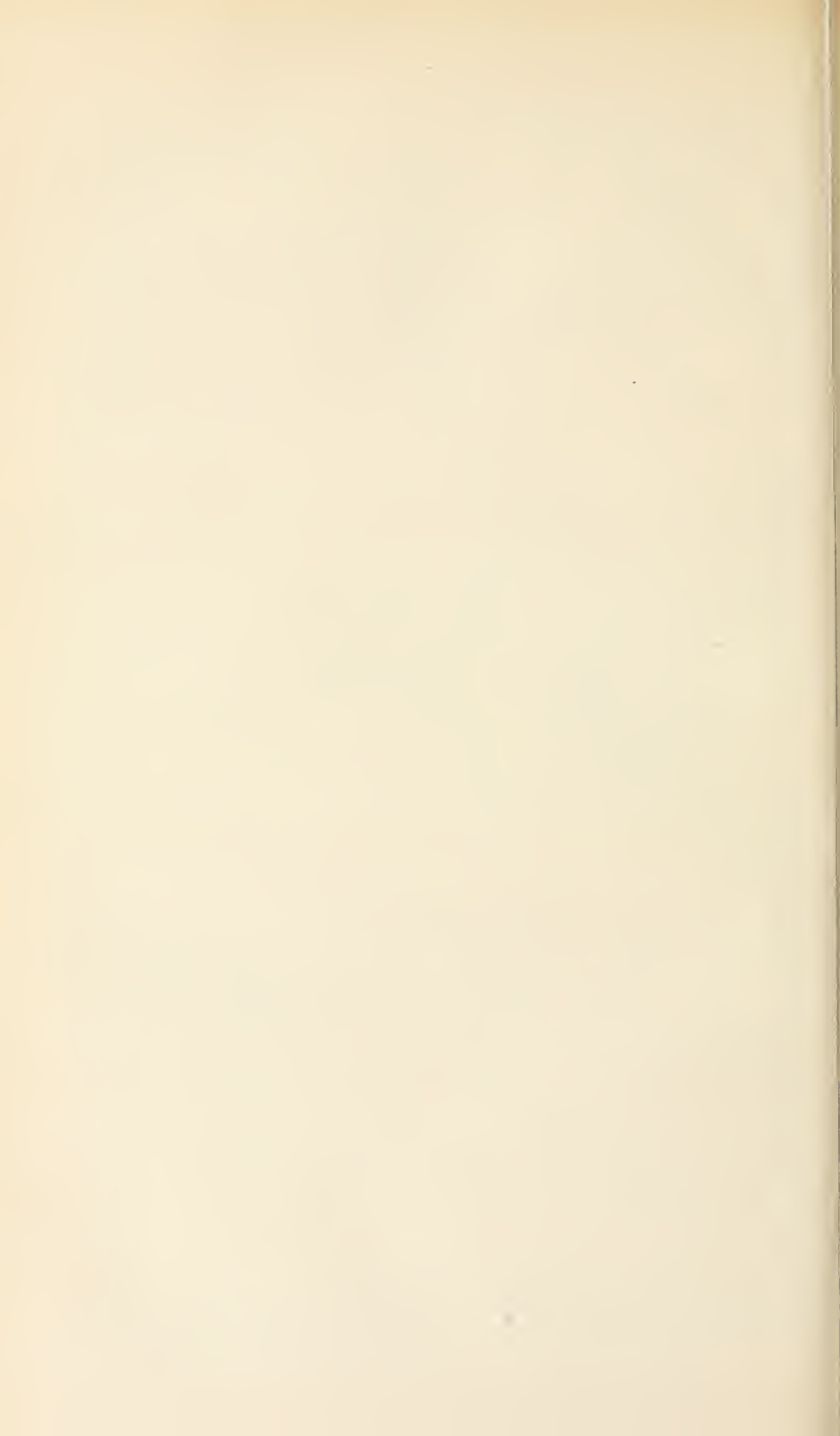
¹ The figures refer to Wallace's Zoological Regions described in his *Island Life*, 1876.

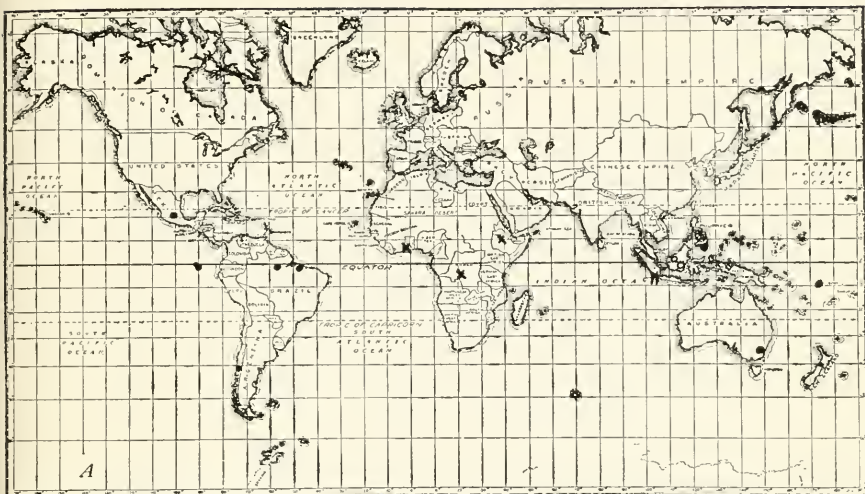
² See note under *Ophrynopus* ? *dentifrons*.



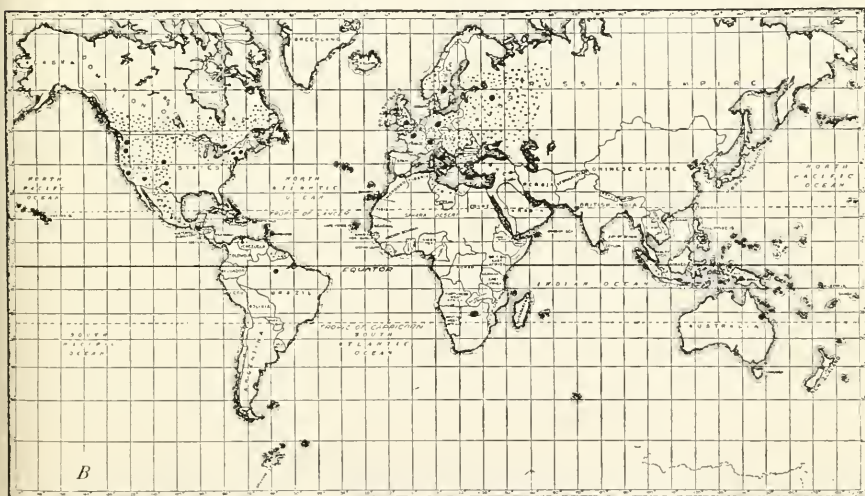
MAP OF THE WORLD, SHOWING THE DISTRIBUTION OF THE SUPERFAMILY ORYSOIDEA.

FOR REFERENCE SEE PAGE 142.





MAP SHOWING DISTRIBUTION OF STIROCORSLA (O), CHALINUS (X), MOCSARYA (H), AND OPHRYNOPUS (●).



MAP SHOWING DISTRIBUTION OF ORYSSUS.

FOR REFERENCE SEE PAGE 142.

cealed and the so-called clypeus may not be the clypeus. This statement is made because of the position of the antennæ. Considering that the clypeus is consolidated with the front it is necessary to assume that the antennæ are inserted below the clypeus which is improbable. (See fig. 1.)

Thorax.—Pronotum narrow, perpendicular, posterior margin arcuate, posterior lateral margin straight; proepimeron wanting; proepisternum large, meeting ventrally for almost its entire length, forming anteriorly a small circular opening; prosternum small, diamond-shaped in outline; mesoprescutum wanting; mesoscutum wider than long, the anterior margin arcuate, the posterior margin truncate; wings in-

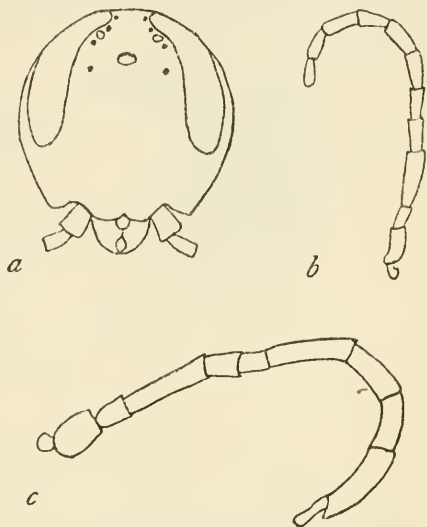


FIG. 1.—ORYSSUS. (a) HEAD FRONT VIEW; (b) MALE ANTENNA; (c) FEMALE ANTENNA.

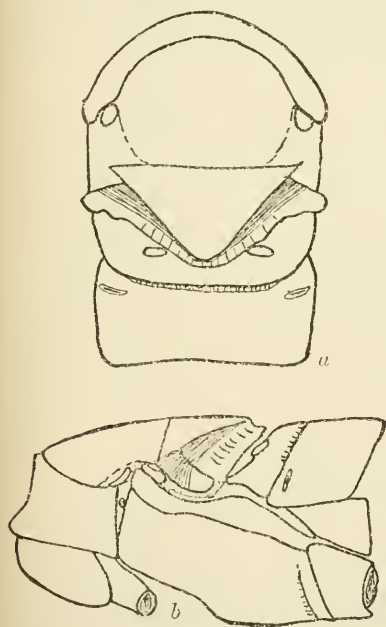


FIG. 2.—THORAX OF ORYSSUS. (a) DORSAL VIEW; (b) LATERAL VIEW.

serted near the posterior third; mesoscutellum completely separated from the mesoscutum, the anterior margin truncate, the posterior obtusely pointed; first thoracic spiracle between the pronotum and mesoepisternum; mesosternum and mesoepisternum not separated; mesolocus present; prepectus distinctly imperfectly defined; mesoepisternum and mesoepimeron very poorly separated, the suture very indistinct anteriorly; mesoepisternum with a raised area extending from near lower part of second coxa to tegula; mesosternum and episternum with a transverse suture a short distance before the intermediate coxæ; metanotum not differentiated into areas; cenchri present; metapostnotum wanting; metepisternum small; metepimeron almost concealed anteriorly by the overlapping metanotum and propodeum, posteriorly large, extending beyond the posterior margin of the propodeum. (See fig. 2.)

Wings.—Wings as in figure 3. In some exotic genera the anal cell is broadly contracted, there being a very small basal cell present. In certain exotic genera the cubitus joins the costa at the same place as the basal vein, and does not join the basal vein as in *Oryssus*.

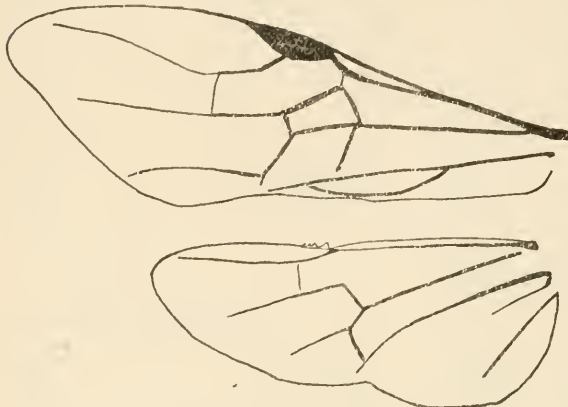


FIG. 3.—WINGS OF *ORYSSUS ABIETES*.

Legs.—The legs, contrary to the usual rule, show much modification in the female, while in the male they are of the usual type. In the male the legs are as follows: Coxæ rather large, all of them contiguous; trochanters long, the posterior ones 2-jointed, the basal division being the

longer; femora stout; tibiæ rather slender, armed apically with one calcarium although the second calcarium on the two posterior pair is often represented by rudiments, the four posterior ones enlarged apically and somewhat curved, the posterior ones simple or serrate on their outer edge; tarsi long, slender, longer than their tibiæ, pulvilli wanting, empodia present but not large, claws with an erect inner tooth. In the female the legs differ from the male as follows: Four posterior legs differing only in the rather shorter tarsi; anterior tibiæ irregular in outline, the calcarium bifid apically; anterior tarsi 3-jointed, the basal joint distinctly longer than the two following. (See fig. 4.)

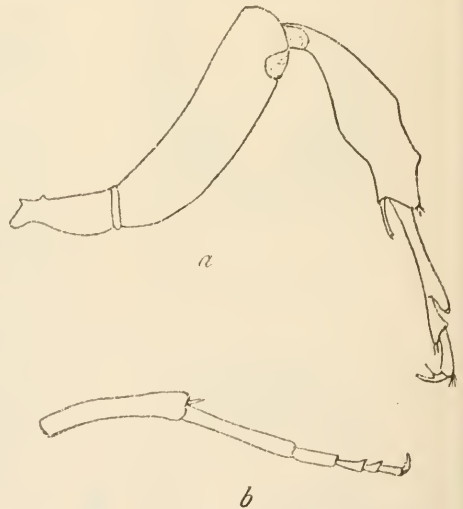


FIG. 4.—LEGS OF *ORYSSUS*. (a) FORELEG OF *O. ABIETES*, FEMALE FROM THE COXA; (b) FORELEG OF *O. SAYII* MALE FROM THE APEX OF THE FEMORA.

Abdomen.—The abdomen, which is cylindrical, is composed of eight tergites and eight sternites. The first tergite is called the propodeum and is undivided. The first two tergites are more coarsely sculptured than the following and are separated from each other by a

foveolate furrow. Third to seventh (inclusive) tergites normal. The eighth tergite produced posteriorly so as to be longer in the dorsal middle. First sternite reduced to a very small plate which is present in the middle only. Second to fifth (inclusive) sternites normal, extending much beyond the apical margins of the corresponding tergites. Sixth sternite emarginate in the apical middle. Seventh sternite lengthened in the middle where it is divided by the sheath (first gonapophyses). Eighth sternite long, bearing two longitudinal carinae which inclose an area called the hypopygidium. These carinae curve outward and upward at the apex and define a small, somewhat circular area. The eighth sternite is grooved down the middle. In this groove the ovipositor (second and third gonapophyses) rests so it appears to issue, when in normal position, from between the eighth sternite and eighth tergite, but in truth it is exerted between the seventh and eighth sternite. Sheath very short, not nearly as long as the ovipositor. Spiracles wanting, or concealed, when the abdomen is held in normal position, by imbrication as in the forficulids, beyond the first tergite. Cerci wanting.

In the male the abdomen has the opening apically, the genitalia concealed, and the apical sternites regular in outline and no defined area on the eighth sternite. (See fig. 5.)

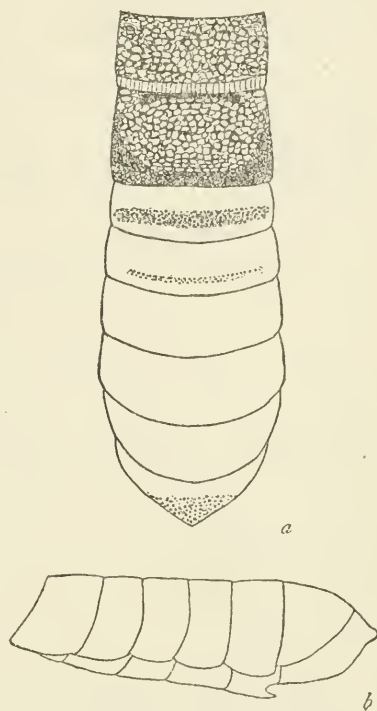


FIG. 5.—ABDOMEN OF ORYSSUS. (a) DORSAL VIEW; (b) LATERAL VIEW FROM THE SECOND.

RELATIONSHIPS OF THE SUPERFAMILY.

The superfamily Oryssioidea is a very distinct group in the suborder Chalastogastra and is perhaps the most highly specialized group within the suborder. By the older writers they have been considered as a group within the Siricidae (Siricoidea of some authors and Xylophaga of others). Of later years they have been treated as a group of equal value with the siricids and tenthredinids. MacGillivray (1906, p. 648) and Enslin (1911, p. 438) treated the group as a family, while Rohwer (1911, p. 217) considers it to be a superfamily. With the Siricoidea the Oryssioidea show relationship in the habits (being internal feeders in wood), the complete separation of

the scutellum from the scutum; the one calcarium of the anterior tibiæ, the loss of notauli, the loss of the proepimeron; and they are more like them in venation than other Chalastogastra. The loss of cerci would place them near Tremicinæ. It may be that they were derived from the Tremicinæ, but they may easily be separated from this group by the characters found below. From the standpoint of the wings MacGillivray (1906, p. 646) said:

So far as their wings are concerned the presence of the second anal cell in the front wings is the only structure that would place the genus *Oryssus* in the superfamily Tenthredinoidea.¹

Ashmead (1898, p. 177) expressed the opinion that Oryssidæ were apparently,

the stem from whence some of the parasitic Hymenoptera originated, i. e., the Megalyridæ, Stephanidæ, etc.

CLASSIFICATION.

The present paper being of preliminary nature, it is only possible at present to point out certain characters which have not been used heretofore in systematic work on these insects, with the hope that other workers will endeavor to make use of them. The prepectus is well defined in *Ophrynopus*, while it is poorly defined in *Oryssus* and *Chalinus*. This character may prove useful to separate genera. The use of the number and type of the facial carinæ may not be the most natural classification, but it is shown on page 142 that it goes hand in hand with the assumed southern extension of the group. The dentation of the hind tibiæ may be of some value. Specific characters may be found on the so-called clýpeus, the relation of antennal joints, the shape of the hypopygidium, and other characters mentioned in the following table. Harrington (1886-7) was of the opinion that all the American species were the same and that certain well-marked color forms existed. To adopt Harrington's synonymy would mean that the characters found on the antennæ, clypeus, and others are not of specific value. Without more conclusive evidence it is much better to treat these as distinct. It may be, however, that Harrington had before him only one species and that this species varied as his material indicated. Bradley (1901, p. 317) expressed the opinion that the color represented constant specific differences, and Konow (1905b, p. (354) 178) went even further than Bradley in recognizing *affinis* Harris.

Superfamily ORYSSOIDEA.

Oryssoida ROHWER, Proc. Ent. Soc. Wash., vol. 13, No. 4, 1911, p. 217.

Distinguishing characters.—Pronotum with the posterior margin strongly curved; mesoscutum extending much beyond the anterior margin of the tegulæ; abdomen with eight sternites and eight tergites;

¹ MacGillivray uses the term "Tenthredinoidea" in the sense of "Chalastogastra" of the author.

abdominal spiracles wanting or concealed; eyes converging above; antennæ inserted much below the eyes and below the apparent clypeus; proepimeron wanting; first perapteron wanting; propodeum not divided; anterior wings with two cubital cells; fore tarsi of female 3-jointed, of male 5-jointed.

Family Oryssidæ Cameron.¹

Oryssites NEWMAN, Ent. Mag., vol. 2, 1834, p. 409.

Oryssina THOMSON, Hym. Scand., vol. 1, 1871, p. 331.

Oryssidæ CAMERON, Monogr. Brit. Phy. Hym., vol. 3, 1889, p. 137.—SHARP, Camb. Nat. Hist., vol. 5, 1895, p. 506.—ASHMEAD, Can. Ent., vol. 30, 1898, p. 177—BRADLEY, Trans. Amer. Ent. Soc., vol. 27, 1901, p. 317—ROHWER, Proc. Ent. Soc. Wash., vol. 13, No. 4, 1911, p. 217—ENSLIN, Deutsch. Ent. Zeit., 1911, p. 438.

Oryssinæ DALLA TORRE, Cat. Hym., vol. 1, 1894, p. 378.

Oryssini KONOW, Term. Fuz., vol. 20, 1897, p. 602; Genera Insectorum, fas. 28, 1905, p. 9.

Characters of the superfamily.

GENERIC SYNOPSIS.

The following generic synopsis is adapted from Konow, 1905*b*, page 177. *Lithoryssus* Brues is omitted (see p. 148).

- | | |
|---|---------------------------|
| Vertex tuberculate..... | 1. |
| 1. Face without carinæ..... | <i>Oryssus</i> Latreille. |
| Face with two or four carinæ..... | 2. |
| 2. Facial carinæ convergent, two in number..... | <i>Chalinus</i> Konow. |
| Facial carina divergent..... | 3, |
| 3. Discoidal cell sessile; face with four carinæ..... | <i>Mocsarya</i> Konow. |
| Discoidal cell petiolate; face with two carinæ..... | 4. |
| 4. Posterior orbits with a carina; anal cell of the fore wings petiolate. | |
| | <i>Stirocorsia</i> Konow. |
| Posterior orbits without a carina; anal cells of the fore wings broadly contracted. | |
| | <i>Ophrynopus</i> Konow. |

Genus CHALINUS Konow.

Chalinus KONOW, Term. Fuz., vol. 20, 1897, p. 605.

Type.—*Oryssus plumicornis* Guerin (Rohwer, 1911).

Chrysoryssus ASHMEAD, Can. Ent., vol. 30, 1898, p. 177.

Type.—*Oryssus imperialis* Westwood (Monobasic).

Genus MOCSARYA Konow.

Mocsarya KONOW, Term. Fuz., vol. 20, 1897, p. 608.

Type.—*Oryssus metallicus* Mocsary (Monobasic).

Genus STIROCORSIA Konow.

Stirocorsia KONOW, Ent. Nachr., vol. 23, 1897, p. 372.

Type.—*Stirocorsia kohli* Konow (Monobasic).

¹ Ashmead, 1898, says that Haliday 1839 recognized this group as a family, but no record of such has been found.

Genus OPHRYNOPUS Konow.

Ophrynopus KONOW, Term. Fuz., vol. 20, 1897, p. 605.

Type.—*Ophrynopus andrii* Konow (Rohwer, 1911).

OPHRYNOPUS (?) DENTIFRONS (Philippi).

Oryssus dentifrons PHILIPPI, Stettin. Ent. Zeit., vol. 34, 1879, p. 303, pl. 1, figs. 5 a-c.

This species, which was overlooked by Konow, may form a new genus. If the figure is correct it may be separated from *Ophrynopus* by the very short malar space, and the facial carinæ are (judging from the description) nearly parallel.

Genus LITHORYSSUS Brues.

Lithoryssus BRUES, Bull. Amer. Mus. Nat. Hist., vol. 22, 1906, p. 492.

Type.—*Lithoryssus parvus* Brues (Monobasic).

Brues described a Hymenopteron which he says should fall in *Oryssinæ* Konow. This genus is known only from the description, but judging on this basis, I doubt if the genus belong to this group; in fact, it may not even be a Chalastogastran. If the number of abdominal segments is correct it can not belong in *Oryssidæ*, as at present defined, or even in *Chalastogastra*. The fewest number of abdominal segments in the *Chalastogastra* occur in the *Oryssoidæ*, where there are eight. The venation is also quite different.

Genus ORYSSUS Latreille.

Oryssus LATREILLE, Précis Char. Gen. Insect., 1796, p. 111.—FABRICIUS, Suppl. Ent. Syst., 1798, p. 218.

Type.—*Oryssus coronatus* Fabricius (Latreille, 1810).

The genus *Oryssus* was established in 1796 by Latreille, but no species were placed in it until 1798, when Fabricius placed *Oryssus coronatus* Fabricius and *Oryssus vespertilio* Fabricius in the Latreillian genus. The first of these was made the type of the genus by Latreille in 1810. At present both forms are regarded as the same.

(A)¹ Second antennal joint distinctly more than half as long as the third; a distinct carina behind the eyes; thorax ferruginous.

ORYSSUS THORACICUS Ashmead.

Oryssus thoracicus ASHMEAD, Can. Ent., vol. 30, 1898, p. 178.—BRADLEY, Trans. Amer. Ent. Soc., 1901, p. 318.

Female.—Length, 4.75 mm.; clypeus regularly rounded, the apical margin depressed, not emarginate; front below the ocelli regularly reticulate; posterior orbits irregularly reticulate behind the carina which is close to the eye; postocellar line distinctly shorter than the intraorbital line; second antennal joint distinctly more than half the length of the third, third subequal with the two following, sixth about

¹ The grouping is based on the female.

one-fourth longer than the seventh, seventh and eighth subequal in length; mesoscutum with two poorly defined longitudinal furrows, the anterior portion between these furrows more finely sculptured than the rest of the mesoscutum; scutellum irregularly reticulate; venation strong; hypopygidium as in figure 6a. Black; thorax, propodeum, and legs, except when mentioned, ferruginous; antennæ piceous; spot on anterior femora, and all the tibiæ exteriorly white; wings hyaline, strongly dusky below stigma; venation dark brown.

Santa Cruz Mountains, California.

Type.—Cat. No. 6845, U.S.N.M.

This is a very distinct little species. Ashmead erroneously described this as a male. His type, which is unique, is a female.

(B) Second antennal joint half or less than half as long as the third; no well defined carina behind the eyes; thorax black.

(I) Seventh and eighth antennal joints subequal; second antennal joint half as long as the third; abdomen black or with the three apical segments pale.

ORYSSUS SAYII Westwood.

Oryssus sayii WESTWOOD, Zool. Journ., vol. 5, 1835, p. 440.—HARRIS, Rept. Ins. Mass. 1841, p. 394.—WESTWOOD, Thesa. Ent. Oxon. 1874, p. 120, pl. 22, fig. 7.—CRESSON, Trans. Amer. Ent. Soc., vol. 8, 1880, p. 49.—PROVANCHER, Addit. Corr. Fauna Ent. Can. Hym., 1889, p. 27.—HARRINGTON, Can. Ent., vol. 18, 1886, p. 30; vol. 19, 1887, p. 81; vol. 19, 1887, p. 239.—PACKARD, Rept. U. S. Ent. Comm., 1890, p. 383.—DALLA TORRE, Cat. Hym., 1894, p. 380.—BRADLEY, Trans. Amer. Ent. Soc., 1901, p. 318.—KONOW, Zeit. Hym. Dept., vol. 5, 1905, p. 182 (358).

The original description by Westwood is as follows:

♀: Niger; capite thoraceque punctatis abdomine subtilius punctato; vertice, ad regionem ocellorum, tuberculato; facie lineis duabus minutis abbreviatis albis inter oculos ad marginem inferiorum; labro albedo; antennis nigris, apice articuli 3ⁱⁱ articulisque 4^{to} et 5^{to} supra albo-notatis; pedibus nigris, apice femorum lineolaque supra tibiali albis; alis dimidio basali hyalinis, dimidio apicali fuscis et ad costam obscurioribus, macula parva substigmatali apiceque ipso hyalinis, stigmati nigro.

Long. corp. ♀ lin. 7½. Exp. alar. lin. 11.

Habitat, in America boreali "New Harmony."

In Mus. nostr. Dom. G. B. Sowerby communicavit.

NOTE.—In the Enclopedie Methodique, vol. 8, p. 561, a second species of this remarkable genus was added by Latreille under the name of *Or. unicolor*, of which both sexes had been captured in the Bois de Boulogne, near Paris. Its characters very much resemble those of the species above described, except that *Or. unicolor* is only half the size of *Or. coronatus*, whereas my new species is somewhat larger than that insect.

Westwood's (1874) figure of the antennæ places this species in group B I. According to his figure the fourth and fifth antennal joints of the female are subequal.

The following description is of males which have been determined as *sayii*:

Male.—Length, 11.5 mm. Clypeus gently rounded, not crenulate laterally, with a deep median notch; front shining, coarsely irregularly reticulate; lateral ocelli situated on a line drawn between the third and fourth tubercles; postocellar line distinctly shorter than the intraorbital line; third antennal joint distinctly shorter than the

fourth and fifth; mesoscutum reticulate, with two poorly defined longitudinal areas which are finely striato-punctate; scutellum reticulate, with a small, shining, sparsely punctate area basally; venation weak, black; fourth and fifth antennal joints beneath, spot on dorsal apices of femora, tibiæ (in part) exteriorly yellowish-white; wings hyaline, strongly dusky beyond base of stigma (except hyaline tip of anterior wings); venation pale brown or yellowish, costa and stigma black.

Hampton, New Hampshire, June 13 and 21, 1911, collected by S. A. Shaw; Ottawa, Canada (Ashmead collection).

ORYSSUS MODESTUS, new species.

Female.—Length, 12.5 mm. Anterior margin of the clypeus rounded out, crenulate laterally, notched in the middle, a tooth in the middle notch; front below the ocelli and posterior orbits coarsely, irregularly reticulate; postocellar line subequal in length with the intraorbital line; second antennal joint half the length of the third, third longer than the fourth and fifth, fifth about half the length of the fourth, seventh and eighth subequal; mesoscutum uniformly reticulate; scutellum punctured, more sparsely so in the middle, longitudinally depressed posteriorly; venation strong; hypopygidium sharply and regularly narrowing apically. Black; apex of the third, the fourth and fifth antennal joints beneath, spot on dorsal apices of femora, basal half of tibiæ exteriorly yellowish-white; tarsi piceous; wings dusky hyaline, radial and costal cells strongly dusky; venation black. (See fig. 6*b*.)

Hoquiam, Washington. One female collected May 29, 1905, by H. E. Burke.

Type.—Cat. No. 14663, U.S.N.M.

Judging from the color, this species is the same as *sayii* Westwood, but the antennæ of *sayii* have, according to the figure, the fourth and fifth joints subequal, while in *modestus* the fourth joint is much longer than the fifth.

ORYSSUS TERMINALIS Newman.

Oryssus terminalis NEWMAN, Ent. Mag., vol. 5, 1838, p. 486.—HARRIS, Rept. Ins. Mass., 1841, p. 394.—BRADLEY, Trans. Amer. Ent. Soc., vol. 27, 1901, p. 318.—KONOW, Zeit. Hym. Dipt., vol. 5, 1905, p. 181 (357).—DALLA TORRE, Cat. Hym., 1894, p. 380.

The original description by Newman is as follows:

Niger, rugosus, abdominis segmentis 3 ultimis rufus; antennarum articulis 4 et 5 extus, femora apice extus, tibiæ basi extus nivea; proalæ ante apicem fascia transversa lata fusca stignatæ. (Corp. long. 5 unc.; alar. dilat. 775 unc.)

Somewhat resembles *O. coronatus*, a species inhabiting the south of Europe, but differs in the detail of its coloring; the head has a crown of tubercles, is rugosely punctured, and entirely black; the antennæ (a character of the genus) are situated immediately adjoining the mouth at the insertion of the mandibles, and appear as if belonging to the instrumenta cibaria; they are black, with the exception of the exterior

portion of the fourth and fifth joints, which is snowy white; the extreme apex of each femur, and about two-thirds of the exterior portion of each tibiæ, is also white; the three segments which terminate the abdomen are red.

Inhabits North America. Taken by Mr. Doubleday, at Trenton Falls.

The following is a description of the species determined as *terminalis*:

Female.—Length, 12 mm. Anterior margin of the clypeus gently rounded out, not crenulate laterally, with a deep median notch; front below ocelli and the posterior orbits coarsely, irregularly reticulate; lateral ocelli on a line between the third and fourth tubercles; postocellar line distinctly shorter than the intraorbital line; second antennal joint half the length of the third, third longer than the fourth and fifth, fifth about half the length of the fourth, seventh distinctly longer than the eighth; mesoscutum reticulate, with two longitudinal depressed areas which are anteriorly finely punctured and posteriorly striato-punctate; scutellum reticulate laterally, shining and sparsely punctured in the middle; venation weak; hypopygidium gently, gradually tapering to the apex, see figure 6*d*. Black; three apical segments rufous; fourth, fifth and base of sixth antennal joints beneath, spot on dorsal apices of femora, tibiæ (in part) exteriorly whitish; wings hyaline, strongly dusky beyond the stigma (except the fore wings which have the apex hyaline); venation pale brown or yellowish, stigma and costa dark brown.

Hampton, New Hampshire. One female collected June 21, 1911, by S. A. Shaw; Ottawa, Canada (Ashmead collection).

This may only be a form of following species, as it differs only in the shape of the hypopygidium.

ORYSSUS HÆMORRHOIDALIS Harris.

Oryssus hæmorrhoidalis HARRIS, Rept. Ins. Mass., 1841, p. 394.—NORTON, Trans. Amer. Ent. Soc., vol. 2, 1869, p. 350.—PROVANCHER, Nat. Can., vol. 10, 1878, p. 227; Petite Faune Ent. Can. Hym., 1883, p. 237.

Harris, after saying that *hæmorrhoidalis* was the same as *terminalis*, described his species as follows:

Female.—Her body is black, rough before, and smooth behind, with the last three segments of a blood red color. The outer side of the fourth and fifth joints of her antennæ, her knees, and a line on the outer edge of her skins, are white. Her feet are dull red. Her wings are clear and transparent, with a broad, smoky brown, transverse band, beyond the middle of the first pair. Her body measures nearly six-tenths of an inch in length.

The following is a description of a species which is considered to be *hæmorrhoidalis*:¹

Female.—Length, 12 mm. Anterior margin of the clypeus rounded out, not crenulate laterally, with a distinct median notch; front below

¹ Rather than describe the two species, which have usually been considered as one, and called *terminalis*, the names "*terminalis*" and "*hæmorrhoidalis*" are used. By an examination of the types, if they are still in existence, the matter may be set straight.

the ocelli and posterior orbits coarsely, irregularly reticulate; lateral ocelli situated on a line drawn between the third and fourth tubercles postcellar line distinctly shorter than the intraorbital line; second antennal joint half as long as the third, third longer than the fourth and fifth, fifth about half as long as the fourth, seventh distinctly longer than the eighth; mesoscutum coarsely punctured, with two longitudinal depressed areas which are more finely punctured and posteriorly striato-punctate; scutellum coarsely punctato-reticulate; hypopygidium very sharply and regularly narrowed apically, see figure 6*h*. Black; three apical abdominal segments rufous; fourth and fifth antennal joints beneath, spot on dorsal apices of femora and tibiae (in part) exteriorly yellowish-white; wings hyaline, strongly dusky beyond the stigma (except apices of fore wings which are hyaline); venation pale brown or yellowish, costa and stigma black.

North Cornway, New Hampshire, June 26, 1909; Hampton, New Hampshire, June 21, 1911. Collected by S. A. Shaw, New York.

ORYSSUS MAURUS Harris.

Oryssus maurus HARRIS, Rept. Ins. Mass., 1841, p. 394.—NORTON, Trans. Amer. Ent. Soc., vol. 2, 1869, p. 351.

Harris, after saying that *maurus* was the same as *sayii*, described it as follows:

Female.—It is of a deep black color, rough before and smooth behind, and is marked with white on the antennae and legs, like the red-tailed kind, with the addition of two, short, white lines on the forehead, between the lower corners of the eyes. The feet are black. The wings have a smoky band beyond the middle, which, however, fades away towards the inner margin. I have seen only females of this species, and they measure from four to five tenths of an inch in length.

New England States.

This has usually been considered the same as *sayii*, but in view of the uncertainty should be held as distinct.

ORYSSUS AFFINIS Harris.

Oryssus affinis HARRIS, Rept. Ins. Mass., 1841, p. 394.—NORTON, Trans. Amer. Ent. Soc., vol. 2, 1869, p. 351.—PROVANCHER, Addit. Corr. Fauna Ent. Can. Hym., 1889, p. 28.—DALLA TORRE, Cat. Hym., 1894, p. 379.—KONOW, Zeit. Hym. Dipt., vol. 5, 1905, p. 181 (357).

The original description is as follows:

Male.—It is possible that my *Oryssus affinis*, which is a male, may be the mate of the foregoing dark-colored species [*maurus*], from which it differs in having reddish feet, and in wanting the two white spots on the forehead. It measures four-tenths of an inch in length.

New England.

Konow is wrong in saying the legs are red, as the original description says feet, which is synonymous with tarsi.

(II) Eighth antennal joint distinctly shorter than the seventh; second antennal joint less than half as long as the third; abdomen red beyond the second segment.

ORYSSUS OCCIDENTALIS Cresson.

Oryssus occidentalis CRESSON, Proc. Ent. Sec. Acad. Nat. Sci., Phila., 1879, p. 9; Trans. Amer. Ent. Soc., vol. 8, 1880, p. 48.—PROVANCHER, Addit. Corr. Fauna Ent. Can. Hym., 1889, p. 27.—DALLA TORRE, Cat. Hym., 1894, p. 379.—BRADLEY, Trans. Amer. Ent. Soc., vol. 27, 1901, p. 318.—KONOW, Zeit. Hym. Dipt., vol. 5, 1905, p. 181 (357).

The original description was as follows:

Black, opaque; head coarsely punctured, the vertex gibbous, crowned with six or seven acute tubercles encircling the lower ocellus; clypeus acutely margined at tip which is truncate; cheeks very prominent; joints 3-6 of antennæ more or less white above; thorax depressed, densely punctured; scutellum triangular, acute at tip; wings smoky beyond stigma; knees and line on outer side of tibiæ, white, tarsi fulvo-testaceous, sometimes more or less obfuscated; abdomen shining, ferruginous, basal segment black, scabrous. Length 0.40 to 0.60 inch. ♂, ♀.

Habitat—Colorado, Nevada (Morrison). Eight specimens.

Type.—Collection American Entomological Society.

Bradley (1901, p. 318) says there are variable white spots between the eyes. These markings probably exist only in the male.

What has been determined as this species may be described as follows:

Female.—Length, 11 mm. Anterior margin of the clypeus rounded out, crenulate laterally; face below the ocelli and posterior orbits coarsely reticulate; postocellar line longer than the intraorbital; lateral ocelli between the third and fourth series of tubercles but nearer the third; second antennal joint less than half the length of the third, the third longer than the fourth and fifth, fifth less than half the length of the fourth, seventh longer than the eighth; mesoscutum regularly punctato-reticulate; scutellum punctured, sparsely so along the middle; venation strong; hypopygidium regularly narrowing toward the apex. Black; abdomen beyond the second segment red; apex of third, fourth, and fifth antennal joints beneath, spot on dorsal apices of femora, tibiæ (in part) externally white; tarsi rufo-piceous; wings dusky hyaline, radial and cubital cells strongly dusky; venation dark brown. (See fig. 6c.)

South Bend, Washington. One female crawling on bark of old white spruce (*Picea sitchensis*). Collected by H. E. Burke and recorded under Bureau of Entomology number "Hopk. U. S. 1950c." Also a female from Mount Hood, Oregon.

ORYSSUS ABIETES, new species.

Female.—Length, 15 mm. Anterior margin of the clypeus gently rounded, depressed, slightly crenulate laterally, without a median notch; front below the ocelli and posterior orbits reticulate, usually uniformly so; posterior orbits not carinate although there is a gently raised area where the carina is normally situated; postocellar line subequal with the intraorbital line; second antennal joint less than half the length of the third, third longer than the fourth and fifth,

fourth distinctly longer than the fifth; eighth distinctly shorter than the seventh beneath; mesoscutum uniformly reticulate, except along the shining middle where there is a longitudinal furrow; scutellum shining, sparsely punctured except posteriorly the punctures are confluent; venation strong; hypopygidium as in figure 6g. Black; abdomen beyond the first segment red; apex of third, the fourth and fifth and base of sixth antennal joints beneath, spot on apices of femora above, and tibiæ beneath (except apices) white; tarsi rufo-piceous; wings hyaline, strongly dusky in the radial and cubital cells; venation dark brown.

Male.—Length, 11 mm. Anterior margin of the clypeus nearly straight, faintly sinuate laterally, not depressed; third antennal joint subequal with the fourth and fifth, sixth longer than the seventh; mesoscutum uniformly reticulate; otherwise as in female. Black; abdomen beyond second segment red; third, fourth, and fifth antennal joints beneath, a line following orbit from lower tubercle to clypeus, spot on malar space, spot at apex of terminal tergite, spot on apices of femora above, tibiæ externally yellow; tarsi rufo-ferruginous; wings hyaline, radial and cubital cells strongly dusky; venation dark brown.

Summerdale, California. Four females and four males collected from June 23 to July 7, 1906, by H. E. Burke on *Abies concolor*.

Type.—Cat. No. 14664, U.S.N.M.

This species is closely related to *occidentalis* Cresson, but differs in the shape of the hypopygidium. The male differs from Cresson's description in the yellow facial markings.

A female from Hoquiam, Washington, collected May 29, 1905, by H. E. Burke, probably belongs here. It has the second tergite abnormal. The foveolate suture separating the propodeum from the second tergite is broken and extends obliquely to the middle basal margin of the third tergite. This makes the propodeum triangularly produced posteriorly and reaching almost to the base of the third tergite.

ORYSSUS PINI, new species.

Female.—Length, 15 mm. Anterior margin of the clypeus rounded out, with a broad median and lateral notch; front below the ocelli and posterior orbits irregularly reticulate; postocellar line slightly longer than the intraorbital line; lateral ocelli on a line drawn between the third and fourth series of tubercles; second antennal joint less than half the length of third, third joint longer than the fourth and fifth, fifth about half the length of the fourth, seventh distinctly longer than the eighth, mesoscutum reticulate in the middle with a longitudinal raised area which has a longitudinal furrow; scutellum shining, sparsely punctured; venation strong; hypopygidium as in figure 6f. Black; abdomen beyond the second segment rufous; third, fourth, fifth, and basal part of sixth antennal joints beneath,

spot on dorsal apices of femora, tibiæ exteriorly (in part) white; tarsi rufo-piceous; wings hyaline, radial and cubital cells dusky; venation black.

Meek, New Mexico. One female collected on white pine by W. F. Fiske. Under Bureau of Entomology number "Hopk. U. S. 3943."

Type.—Cat. No. 14665, U.S.N.M.

ORYSSUS RELATIVUS,
new species.

Female.—Length, 14 mm. Differs from *Oryssus pini* as described above as follows: Mesoscutum without a smooth median area which has a furrow; scutellum more closely punctured; lateral ocelli opposite the third series of tubercles. (See fig. 6e.)

Colorado. One female from C. F. Baker collection.

Type.—Cat. No. 14666, U.S.N.M.

ORYSSUS HOPKINSI,
new species.

Male.—Length, 10.5 mm. Anterior margin of the clypeus very gently rounded out, deeply notched in the middle and with a smaller notch above the inner margin of antennæ; front below the ocelli and posterior orbits regularly reticulate;

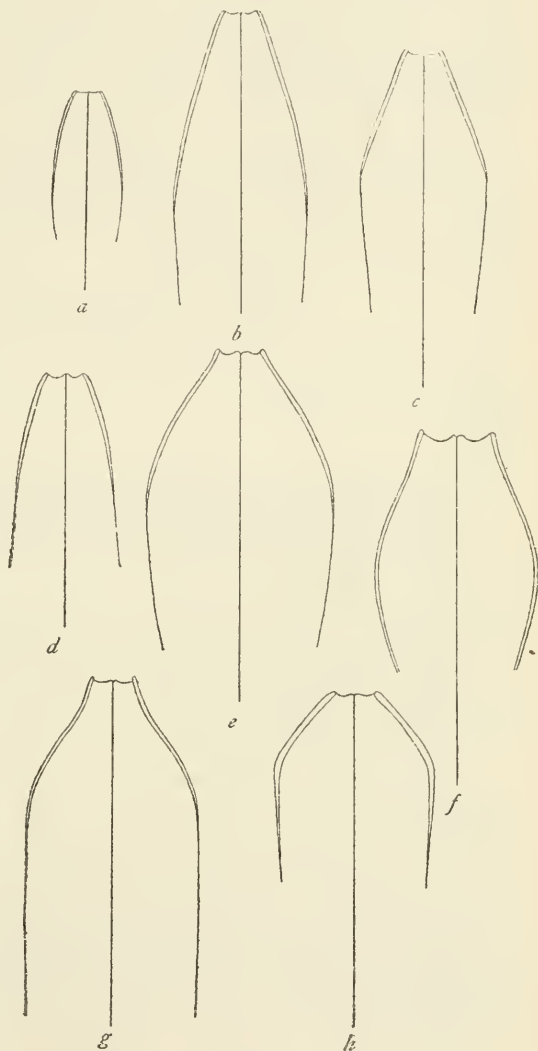


FIG. 6.—OUTLINES OF THE HYPOPYGIUM OF ORYSSUS. (a) THORACICUS; (b) MODESTUS; (c) OCCIDENTALIS; (d) TERMINALIS; (e) RELATIVUS; (f) PINI; (g) ABIETES; (h) HÆMORROHODIALIS.

lateral ocelli situated on a line between the third and fourth series of tubercles; postocellar line subequal with the intraorbital line; third antennal joint subequal with the fourth and fifth; mesoscutum uniformly reticulate; scutellum opaque, sparsely punctured; venation strong. Black; abdominal segments beyond the second piceous, paler

beneath; spot below tubercules, third, fourth, and fifth antennal joints beneath, spot on dorsal apices of femora, tibiæ exteriorly, and a spot on apical dorsal segment yellow; wings hyaline, radial and cubital cells strongly dusky; venation dark brown.

Port Angeles, Washington. One male bred from a pupa collected in an old mine of Cerambycid in the dead wood of living Douglas spruce, May 15, 1899, by A. D. Hopkins. Recorded under Bureau of Entomology number "Hopk. U. S. 141."

Type.—Cat. No. 14667, U.S.N.M.

This insect was probably killed before pigmentation was complete. It belongs to the group *occidentalis* and no doubt would have the abdomen mostly red. Can this account for the amount of red on the abdomen observed by Harrington? It appears some of his specimens were dug from their holes.

SYNOPSIS OF NEARCTIC SPECIES OF ORYSSUS.

The following synopsis includes only those species and sexes known to the writer.

- | | |
|--|-------------------------|
| Females..... | 1. |
| Males..... | 8. |
| 1. Second antennal joint distinctly more than half as long as the third; a distinct carina behind the eyes; thorax ferruginous; length 5 mm..... | <i>thoracicus</i> . |
| Second antennal joint half or less than half as long as the third; no distinct carina behind the eyes although there may be an indistinct raised area; thorax black; 10 mm. or over..... | 2. |
| 2. Seventh and eighth antennal joints subequal; second antennal joint half as long as the third; abdomen black or with only the three apical segments red..... | 3. |
| Seventh antennal joint distinctly longer than the eighth; second antennal joint less than half as long as the third; abdomen red beyond the second segment.. | 5. |
| 3. Clypeus crenulate laterally, a tooth in the median notch, apical margin narrowly depressed; venation strong; abdomen black..... | <i>modestus</i> . |
| Clypeus not crenulate laterally, a narrow median notch in which there is no tooth, apical margin broadly depressed; venation weak; three apical abdominal segments red..... | 4. |
| 4. Hypopygidium sharply narrowing near the apex..... | <i>hamorrhoidalis</i> . |
| Hypopygidium not sharply narrowing apically..... | <i>terminalis</i> . |
| 5. Anterior margin of the clypeus with a median notch..... | 6. |
| Anterior margin of the clypeus without a median notch..... | 7. |
| 6. Mesoscutum with a smooth raised area which has a longitudinal groove; lateral ocelli on a line drawn between the third and fourth tubercules..... | <i>pini</i> . |
| Mesoscutum without a smooth raised area and groove; lateral ocelli opposite the third tubercules..... | <i>relativus</i> . |
| 7. Hypopygidium sharply narrowed apically and then produced so as to have an apical neck..... | <i>abietes</i> . |
| Hypopygidium without an apical neck..... | <i>occidentalis</i> . |
| 8. Abdomen entirely black..... | <i>sayii</i> . |
| Abdomen in part red..... | 9. |
| 9. Clypeus without a deep median notch; inner orbits with a complete yellow line..... | <i>abietes</i> . |
| Clypeus with a deep median notch; inner orbits with at most a pale spot..... | 10. |
| 10. Anterior margin of the clypeus rounded anteriorly; head black..... | <i>relativus?</i> |
| Anterior margin of the clypeus straight; head with pale yellow spots.... | <i>hopkinsi</i> . |

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