

In a longitudinal section, these parts appear as stout, chitinous hooks, resembling somewhat the mandibular hooks in dipterous larvæ—thus they may be referred to as labral hooks. This structure presents some striking variations or modifications in different families, groups, genera, and even in allied species of the same genus. In Scolytidæ there is a striking difference in the structure and form of the clypeus, labrum, and labral hooks in representatives of different genera, primary groups, and sub-families. In *Dendroctonus* (Plates IV and V), the clypeus and labrum are separated by a distinct suture, and the latter appears to be capable of articulation. The labral hooks are prominent in some species and extend back to the base of the clypeus, while in others they are very short, and do not extend to the base of the labrum. In *Platypus* and *Crassotarsus* (the two principal genera of the sub-family Platypodinæ) the clypeus appears to be completely divided and widely separated by the labrum, which occupies a median position and is firmly attached to the epistoma, or second clypeus (Plate V); the apex scarcely extends beyond the apical angles of the first clypeus, from which it is separated by a deep, narrow emargination. The labral hooks appear to be modified into parallel sclerites between the labrum and clypeus, and firmly attached to the second clypeus. The ventral portion of this combination structure is chitinous, strongly convex in the middle, and closely, obliquely sulcate each side, while towards the base it is deeply concave.

In the *Corthyli* group (sub-family Scolytinæ), including *Corthyli*, *Pterocyclon* (*Monarthrum*), *Tripodendron* (*Xyloterus*), the structure of the clypeus and labrum is intermediate between the *Hylesinæ* and *Platypodinæ*, in the fact that the anterior margin of clypeus is obscure or completely coalesced with the labrum, and the labral hooks are parallel.

In *Scolytus muticus* (which, at present, represents another sub-family) the clypeus and labrum are separated by a distinct suture, and the labral hooks extend from the middle of the latter to the middle of the former, curving outward towards the base (Plate V).

There is another feature of the labral hooks exhibited in some species, where the anterior ends appear to be jointed. In *Dendroctonus terebrans* they are also articulated with another pair of similar structures, which appear to belong to the pharynx.

As previously noted, there is a remarkable resemblance between these labral hooks and the mandibular hooks in certain dipterous larvæ. They also appear to be representative of primitive appendages. Perhaps, after all, the labrum may represent a primary first segment or head. At any rate, the



## MOUTH PARTS OF SCOLYTIDAE.

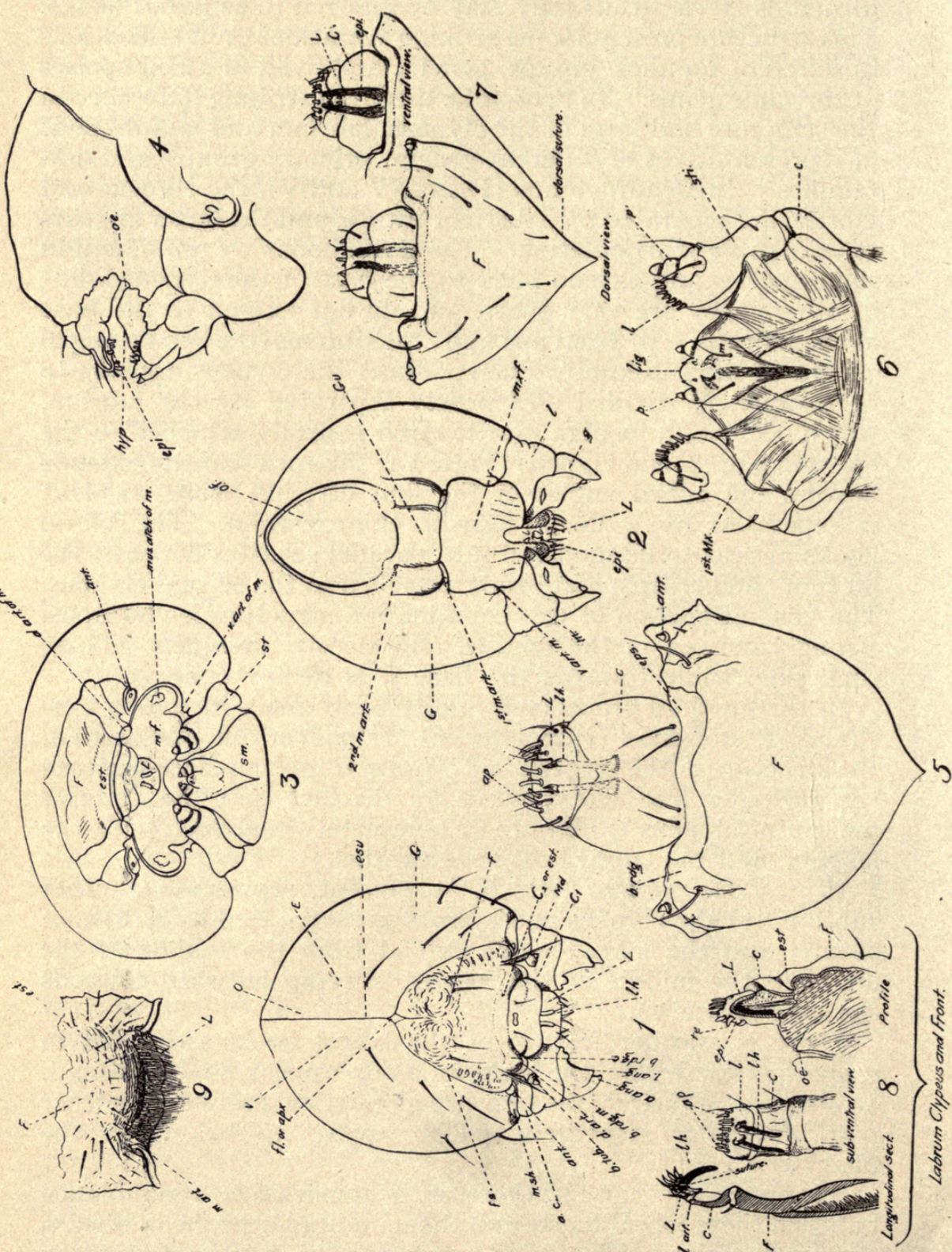


PLATE IV.



labrum and other parts of the anterior area of the larval head, including the epipharynx, possess certain features common to such a wide range of species, that they must be recognized, especially in the coleopterous larvæ, as possessing characters of prime importance for future systematic work, and, it seems to me, offer a rich field for original research.

#### EXPLANATION OF PLATE IV. MOUTHPARTS OF SCOLYTIDÆ.

1. Head of Larva (*Dendroctonus ponderosæ*), dorsal view.
2. Same—ventral view.
3. Same—oral view.
4. Same—lateral view.
5. Same—front, clypeus and labrum.
6. Maxillæ of *D. valens*, showing first and second with muscular structures.
7. Front, clypeus and labrum of *D. terebrans*.
8. Front, clypeus and labrum anatomy of *D. valens*.
9. Front, epistoma and labrum of adult *D. brevicornis*, var. *barberi*.

#### ABBREVIATIONS.

- a. ang. .... Anterior angle of mandible.  
 ac. .... Antecoxal piece.  
 ant. .... Antenna.  
 ap. .... Apical palpi of epipharynx.  
 b. rdg. e. .... Basal ridge of epistoma.  
 b. rdg. m. .... Basal ridge of mandible.  
 b. tub. .... Basal tubercle of mandible.  
 Cl. .... Clypeus.  
 C. 1. .... 1st Clypeus.  
 C. 2. .... 2d Clypeus.  
 c. .... Cardo.  
 d. art. of m. .... Dorsal articulation of mandible.  
 E. .... Epicranium.  
 epi. .... Epipharynx.  
 est. .... Epistoma.  
 esu. .... Epicranial suture.  
 F. .... Front.  
 fl or ap. .... Fontenal (or apex) of frontal area.  
 fs. .... Frontal suture.  
 G. .... Gena.  
 Gu. .... Gula.



## LABRUM OF SCOLYTID LARVÆ.

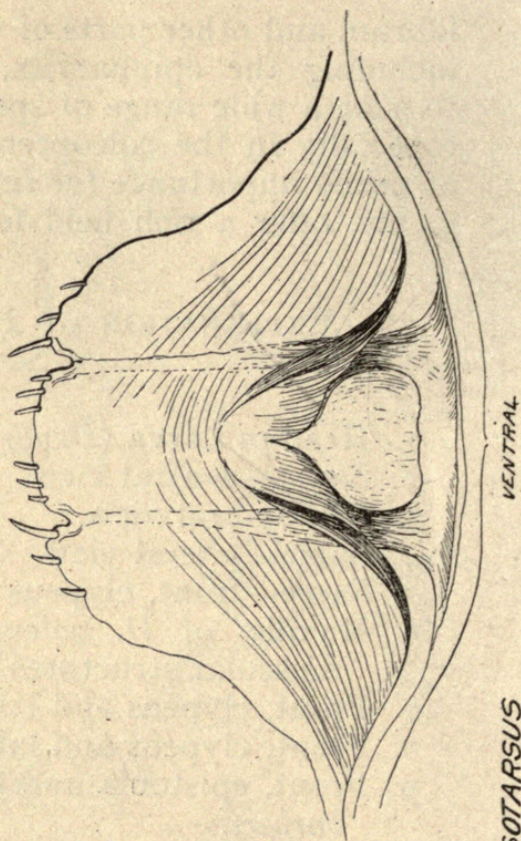
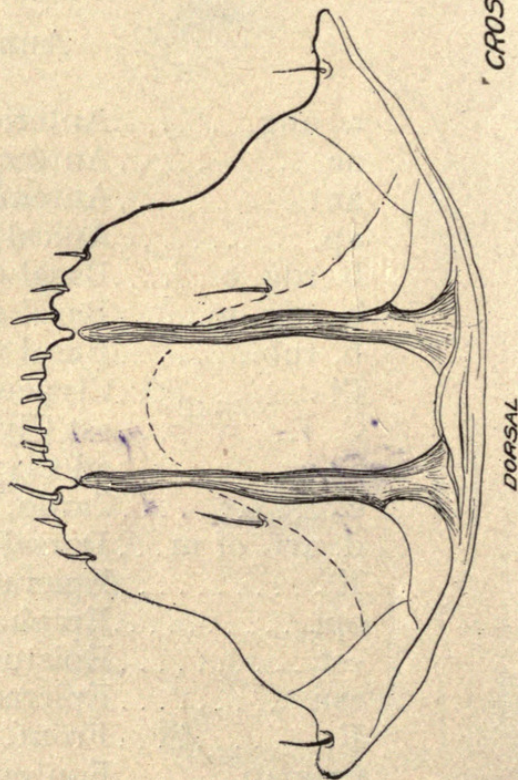
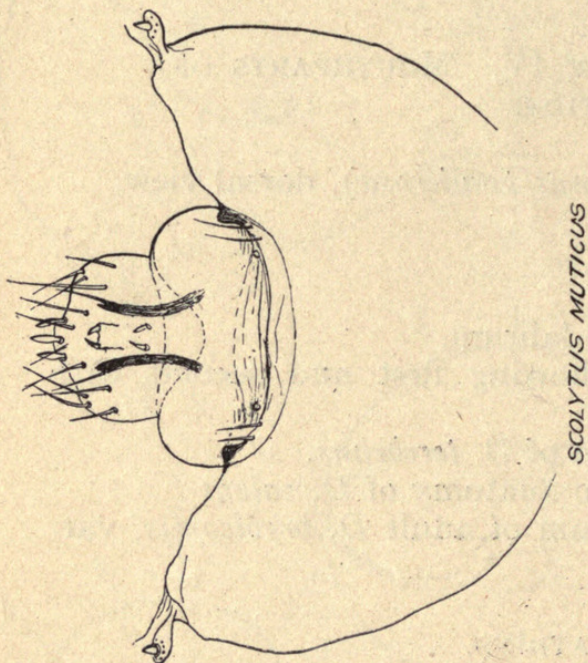
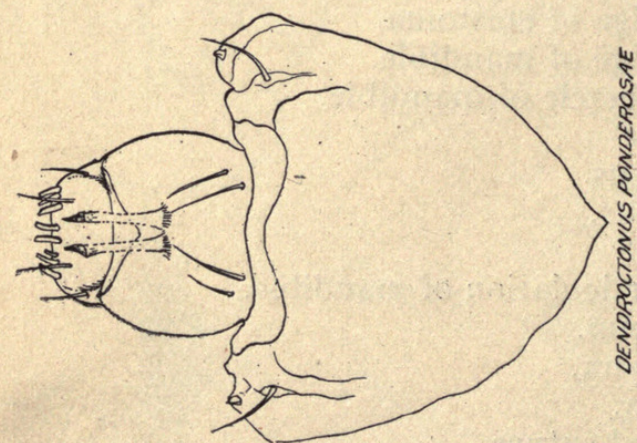


PLATE V. LABRUM OF SCOLYTID LARVÆ.



hyp.....	Hypopharynx.
I, ang.....	Inner angle of mandible.
L.....	Labrum.
l.....	Lacinia.
lh.....	Labral hooks.
l. art.....	Labral articulation.
lig.....	Ligula.
Md.....	Mandible.
m. sh.....	Mandible sheet.
mx.....	Maxillary foramen.
1st. mx.....	1st Maxilla.
2d. mx.....	2d Maxilla, or labium.
O.....	Occiput.
of.....	Occipital foramen.
oe.....	Œsophagus.
p.....	Palpiger.
pl.....	Palpus.
sm.....	Sub-mentum.
sti.....	Stipes.
te.....	Taste palpi.
v.....	Vertex.

---

#### SOME NOTES ON THE PROVANCHER MEGACHILIDÆ.

By E. S. G. Titus.

Through the kindness of Abbé V. A. Huard, Curator of the Museum of the Department de l'Instruction Publique, Quebec, Canada, I have had the opportunity of examining the specimens of the Megachilidæ (now in the Museum at Quebec) upon which Abbé Provancher based his determinations.

These specimens have been compared with the Cresson and other types at Philadelphia and with the collections in the National Museum at Washington.

The only references given are those of Abbé Provancher's articles and such others as directly relate to his writings.

The types of the new species unless otherwise stated are in the Museum at Quebec.

#### MEGACHILINÆ.

*Megachile relativa* Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 227, 232, n. 12, ♀  
(*Megachile optiva* in part).



1883: Fauna Ent. Can. Hym. p. 710, 715, n. 12, ♀ (*Megachile optiva* in part).

1888: Add. Fauna Ent. Can. Hym. p. 462 (*Megachile optiva* in part).

1898: Dalla Torre, Cat. Hym. v. X, p. 438, ♀ (Provancher references to *M. optiva* in part.)

One of the two female specimens under the number 877 appears to be referable to Cresson's *relativa* and has been compared with the type.

The clypeus is slightly emarginate, mandibles apparently 4-toothed slightly interrupted band on dorsal abdominal segment 4, bands widely, interrupted on segments 2 and 3, missing on first segment (rubbed), edges of abdominal segments with dense pubescence; tarsal claws each with a sharp basal tooth. Recorded by Provancher from "St. Hyacinth, Cap Rouge, etc."; it is of course impossible to determine from which of these localities the above specimen was taken.

*Megachile leoni* n. sp. ♀.

Same references as above given under *Megachile relativa* apply to this species, the specimen upon which it is founded being the other specimen of "*Megachile optiva*" in the Provancher collection. In general appearance it is near to *relativa*.

Length 9 mm. Pubescence of the insect white and yellow mixed (specimen very dirty); not as dense or as long on the clypeus as elsewhere, dorsal abdominal bands present and entire except on first segment which has the band slightly interrupted, last dorsal segment with rather long black pubescence, other dorsal segments with scattering black hairs on the disk, pubescence of scopa coarse, short and yellow, of tarsi bright orange; punctuation close and coarse, on clypeus not so close nor so deep as on remainder of head; mandibles 5-dentate, teeth obsolete and irregular; clypeus entire; tegulae fuscous, wings slightly embrowned, transverse nervure before basal nervure; last two joints of front tarsi reddish, all the spurs reddish yellow, front claws with a distinct basal tooth; hind claws without, middle legs broken, first tarsal joint on posterior legs flattened, scarcely as broad at tips as at base, not subparallel.

*Cypophaga inermis* Provancher.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 229, n. 6, ♂ (*M. simplex* Prov.)

1883: Fauna Ent. Can. Hym. p. 710, 712, n. 6, ♂ (*M. simplex* Prov.)

1888: Add. Fauna Ent. Can. Hym. p. 323, n. 6, ♂, p. 462, (*M. inermis* Prov.)

1896: Dalla Torre, Cat. Hym. v. X, p. 449 (*M. simplicissima* D. T.)



This species is very closely related to *M. montivaga* Cresson and I have deemed it advisable to give a rather full description of the one specimen. The species was first named *M. simplex* by Abbé Provancher, but in 1888 he renamed it *M. inermis*, doubtless having become aware that Smith in 1853 had also described a *M. simplex*. Dalla Torre evidently overlooked this name *M. inermis* and renamed the species *M. simplicissima*.

Form subparallel; pubescence mostly white, some black hairs on upper part of cheeks near eyes and on dorsal abdominal segments where it is rather dense, pubescence of thorax white somewhat mixed with ochraceous on the dorsum, face and cheeks with long white hairs, tarsi clothed with yellowish pubescence, dorsal abdominal bands close and appressed, absent on first segment, widely interrupted on second segment (rubbed?), first and second segments clothed with a loose gray pubescence; punctuation regular and close, that on scutellum exceedingly close rather large and with the ground surface tessellated; head very broad and extending well behind the eyes, antennæ simple, with a tendency to be crenulated beneath, fuscous beneath; mandibles long, subparallel, black with a red band across outer tooth and on inner teeth at tips, 3-toothed, first tooth long and sharp, middle tooth shortest, a long, flattened, rounded and turned inward at tip, basal tooth, cheeks apparently not armed; labrum truncate at tip (in *pugnata* it is notched); tegulæ reddish-black; a central smooth slightly elevated line on anterior mesothorax, wider posteriorly and reaching almost from tegulæ to apical margin; transverse nervure interstitial; femora reddish inside; claws cleft, with an enlargement but no basal tooth; 6th dorsal segment with a prominent carina, shallowly, broadly emarginate, apical carina thin and almost obsolete, lateral teeth flattened in axial plane of body and bent inward, round at tip, 7th segment produced and with a faint emargination at tip; no coxal spines.

Redescribed from one ♀ specimen numbered 873, and recorded by Provancher.

*Megachile vancouverensis* Provancher. ♂.

1888: Add. Fauna Ent. Can. Hym. p. 425, n. 3, p. 457.

1896: Dalla Torre, Cat. Hym. v. X, p. 451.

In shape very much like *M. avara* Cresson, but is wider, has more pubescence on abdomen, thus making it appear grayer.

Pubescence long and white, mixed with brown on the vertex and on front of thorax almost back to tegulæ, short black hairs on outer orbits of eyes, reaching about half way from vertex to base, cheeks back of this portion have some black hairs mixed with short white ones, segments 3, 4, 5 with more or less brown or black hairs on dorsum; middle tarsi densely clothed above and hind tarsi beneath with short yellow pubescence, some black hairs above on all the tibiæ; pubescence of all the femora long and white, first four joints of tarsi fringed with long white hairs, some of which have brown tips, first joint concave, yellowish red



beneath, darker above, with the upper edge quite black, each margin fringed with short coarse brownish red hairs, second, third and fourth joints with short coarse hairs on edges, all of the joints have short flattened lobes projecting beyond the apex, claw joint ferruginous as long as three before it combined, claws black at base of cleft, tips ferruginous; anterior coxæ with well developed black spines, tipped with red, subapical spines ferruginous, trochanters and coxæ black; front and middle femora slightly swollen, all the femora reddish beneath, the first with the portion where the tibia rests when closed against it smooth and highly polished, yellowish-red, front tibiæ same color as femora, also polished and with a marginal fringe of white hairs; punctures of head and thorax rather fine and close, on abdomen sparse; antennæ black, last joint flattened but not expanded; mandibles 4-toothed, straight above, toothed below at base, black, punctured, inner and outer teeth with reddish marginal lines; clypeus with very fine punctures, edge impunctate, polished, with a central emargination and having on each side two teeth; second joint of labial palpi slightly longer than first; maxillary palpi 3-jointed, bare, basal joint broadest, a white bristle at tip of third joint, this joint tapers from base to tip; 6th dorsal abdominal segment with a compressed carina, broadly, shallowly emarginate, edges slightly broken or irregularly serrate, apical carina thin with two long rounded distant teeth, 7th segment not at all visible; cheek armed with a scale-like process.

Redescribed from one specimen numbered 1417 and reported by Provancher to have been received from "Vancouver (Taylor)." This is a very peculiar species and does not belong in *Megachile* s. str.

*Anthemois addenda* Cresson.

1888: Add. Fauna Can. Ent. Hym. p. 462 (*acuta* given as syn. of *latimanus*).

I have examined one ♀ labelled *Megachile acuta* and presume that the above reference is to this specimen. The specimen is numbered 1113 and also bears the number 188. It is distinctly referable to Cresson's *M. addenda*.

*Anthemois infragilis* Cresson.

1883: Le Naturaliste Canadien, v. XIV, p. 37, n. 5, ♂ (*Osmia frigida*).

1888: Add. Fauna Can. Ent. Hym. p. 325, ♂, 462 (*Osmia frigida*).

1896: Dalla Torre, Cat. Hym. v. X, p. 395 (*Osmia frigida*, Prov. references, ♂ only). I have examined one specimen of this species, numbered 1061 and labelled *Osmia frigida*. It is a typical specimen of Cresson's *infragilis*. Provancher in 1888, in his references to the above species on p. 324, described the female, but I have not seen the specimen nor can I recognize it from his description.

[TO BE CONTINUED.]

[ISSUED JANUARY 10, 1906.]



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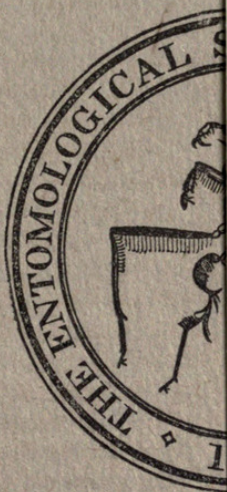


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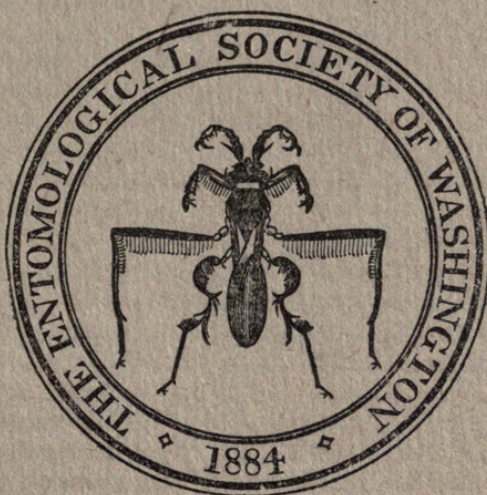
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SOME NOTES ON THE PROVANCHER MEGACHILIDÆ.

By E. S. G. Titus.

[Continued from page 152.]

*Xanthosarus vidua* Smith.

1882: *Le Naturaliste Canadien*, v. XIII, p. 226, 227, n. 3, ♂ (*M. scrobiculata*); p. 226, 230, n. 8, ♀ (*M. grandis*); p. 227, 240-241, n. 10 (*M. centuncularis*).

1883: *Fauna Ent. Can. Hym.* p. 710, 711, n. 3, ♂ (*M. scrobiculata*); p. 710, 713-714, n. 8, ♀ (*M. grandis*); p. 710, 714-715, n. 19, ♀ (*M. centuncularis*);

1888: *Add. Fauna Ent. Can. Hym.* p. 462 (species as above noted).

1896: Dalla Torre, *Cat. Hym.* v. X, p. 425 (*M. centuncularis*, Prov. references); p. 445 (*M. scrobiculata* as syn. of *pugnata*, Prov. references); p. 444 (*M. grandis* under *M. pollicaris* Prov. references).

The specimen marked *M. grandis* is numbered 874 and the locality at present unknown. The ♂ marked *M. scrobiculata* bears the number 871 and it also has no known locality at present. One ♀ numbered 876 and labelled *M. centuncularis* is doubtless from Provancher's locality "CC." I have not added above in the references to *M. centuncularis* the following two as I have no means of knowing to what species he refers.

1877: *Le Naturaliste Canadien*, v. IX, p. 23, 95.

1886: " " v. XVI, p. 34.

*Xanthosarus melanophæa* Smith.

1882: *Le Naturaliste Canadien*, v. XIII, p. 226, 228, n. 4, ♂ (*M. femorata*), p. 227, 232, n. 13, ♀ (*M. melanophæa*).



1883: Fauna Ent. Can. Hym. p. 710, 712, n. 4, ♂ (*M. femorata*); p. 710, 715-716, n. 13, ♀ (*M. melanophæa*).

1888: Add. Fauna Ent. Can. Hym. p. 462 (species as noted above).

1896: Dalla Torre, Cat. Hym. v. X, p. 420 (*M. femorata*, Prov. references); p. 438 (*M. melanophæa*, Prov. references).

1903: Friese, Zeits. Hym. Dip., v. III, p. 248 (*M. canadensis*).

The specimen labelled *M. femorata* is numbered 872, locality unknown, the ♀ labelled *M. melanophæa* is numbered 878 and is from "C."

*Xanthosarus femorata* Smith.

1882: Le Naturaliste Canadien, v. XIII, p. 226, No. 27, n. 1, ♂ (*M. latimanus*).

1883: Fauna Ent. Can. Hym. p. 710-711, n. 1, ♂ (*M. latimanus*).

1888: Add. Fauna Ent. Can. Hym. p. 462 (*M. latimanus*).

1896: Dalla Torre, Cat. Hym, v. X, p. 436 (*M. latimanus*, Prov. references, ♂ only).

One specimen numbered 870, labelled *M. latimanus* appears to be referable to *X. femorata* Sm. It is from either St. Hyacinth or Cap Rouge as Provancher reports the species from both localities.

I have not added above the reference to the ♀ of *latimanus* given by Provancher because I have seen no specimens so labelled.

1888: Add. Fauna Ent. Can. Hym. p. 324, n. 9, ♀ (*M. latimanus*). Nothing can be told from the description, which appears to be founded on some *Xanthosarus*.

*Xanthosarus latimanus* Say.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 227-228, n. 2, ♂ (*M. frigida*); p. 227, 231, n. 11, ♀ (*M. mendica*).

1883: Fauna Ent. Can. Hym. p. 710, 711, n. 2, ♂ and ♀, p. 710, 715, n. 11, ♀ (as above).

1888: Add. Fauna Ent. Can. Hym. p. 462, (*M. frigida* and *M. mendica*).

1896: Dalla Torre, Cat. Hym. v. X, p. 431, ♂ (*M. frigida*, Prov. references); p. 439, ♀ (*M. mendica*, Prov. references).

*Megachile frigida* is reported by Provancher from St. Hyacinth and *M. mendica* from Chicoutimi. A specimen labelled *M. frigida* bears the number 1012 and one labelled *M. mendica* is numbered 1013.

*Sayapis*, new name for *Gnathocera* and *Ceratias* both preoccupied.

1882: Le Naturaliste Canadien, v. XIII, p. 232 (*Gnathocera*, type *cephalica*).





1906. "Some notes on the Provancher Megachilidae." *Proceedings of the Entomological Society of Washington* 7, 149–166.

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