

A Revision of the Genus *Cupila* Casey

(Coleoptera : Pselaphidae)

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Cupila is a small genus belonging to the subtribe Trimiina of the tribe Euplectini. The genus was erected by Casey in 1897 for the single species *Trimium clavicorne* described by Mäklin in 1852 from material collected in Oregon. In 1945 Park described a second species, *Cupila mexicana*, in a new subgenus, *Cutrimia*. *Cutrimia* was distinguished from *Cupila* primarily by the absence of basal abdominal carinae, a character that is now known to be variable within samples of *Cupila* s. str. Since the subgenus was based on a unique male, its final status should await the study of additional specimens. The second nearctic species, *Cupila excavata* Park and Wagner, was described in 1961 from specimens collected at Charleston, Oregon.

A third nearctic species is proposed in this revision, the descriptions of *C. clavicornis* and *C. excavata* are emended, and a key is provided to the males of the genus. The female of *C. mexicana* is unknown. Differences between females of the remaining species are slight but the minor differences are noted in the species discussion. A key to the females is omitted pending the collection of additional material.

Cupila is closely related to the genus *Actium*. Mature adults of both sexes of *Cupila* are usually dark brown to black whereas most *Actium* are light brown and the darker species are reddish-brown. More fundamental differences are found in the males and mainly reflect modifications of sternites VI and VII for the relatively small genitalic structure of *Cupila* as compared to the larger genitalia of *Actium* (approx. 2.5 : 1.0). Sternites III to V of *Cupila* are modified laterally, VI is weakly emarginate and VII is visible only as a minute transverse closure for the emargination of VI. For *Actium*, one or more of sternites II to IV are modified laterally, sternite VI is strongly emarginate and VII is exposed as a large oval plate.

The following characteristics aid in identifying the genus: Head with small, paired, distinctly dorsal vertexal foveae; ventral surface of head bearing capitate setae; antennal club composed of the last three segments (fig. 1) with segment X asymmetrically triangular, deeper than wide; and more or less closely appressed to XI. Pronotum with a biarcuate antebasal sulcus that extends medianly almost to base of pronotum. Elytron with sutural, discal, and subhumeral foveae, the discal fovea associated with a shallow depression but disc not striate. First visible tergite with basal carinae weak or absent. Profemur with weak ventral sulcus containing a row of specialized setae; protibia with minute subapical spine, procoxal

cavities foveate at anterior margin (fig. 6). Tarsi terminate in large primary and small secondary claws (fig. 2). Mesocoxal cavities broadly confluent; post mesocoxal foveae present. Metasternum medianly depressed, the lateral margins of the depression bordered by an irregular line of setae. Males have sternites III to V modified (figs. 3, 4, 5), VI with shallow median emargination; VII transverse, a penial plate with only the distal $\frac{1}{5}$ exposed (fig. 8). Aedeagus laterally compressed (figs. 10, 11), the parameres slightly asymmetric. Six sternites of female without special modifications, VI sinuate.

KEY TO MALES OF CUPILA

1. Margins of sternite IV with cornute processes directed posteriorly, the processes visible dorsally *mexicana* Park
Sternite IV with simple lateral margins 2
- 2(1) Sternite V with multiple foveae at each lateral margin; basolateral margins of pronotum smooth *multifossa* new species
Sternite V with single fovea at each lateral margin; basolateral margins of pronotum tuberculate 3
- 3(2) Lateral depressions of sternite III distinctly carinate on median and lateral margins; sternite IV with slight depression continuous with that of III *clavicornis* (Mäklin)
Lateral depressions of sternite III distinctly carinate on median margin only; sternite IV with deep depression continuous with that of III *excavata* Park and Wagner

CUPILA EXCAVATA Park and Wagner

(Figs. 4, 6-10)

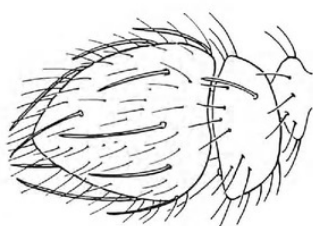
Cupila excavata Park and Wagner, 1961, Univ. Washington Publ. Biol., 16: 18.

MALE (slide).—Head 220 μ long, 248 μ wide; vertexal foveae 105 μ between centers; ventral surface with 14 capitate setae; eyes moderate. Antenna 270 μ long; segments I + II 95 μ long, 38 μ wide; III to VI inclusive, 75 μ long, 27 μ wide; VII 15 μ long, 30 μ wide; VIII 15 μ long, 35 μ wide; IX 15 μ long, 45 μ wide; X 15 μ long, 68 μ wide, asymmetrical, XI 105 μ long, 85 μ wide; XI as long as preceding 5 segments.

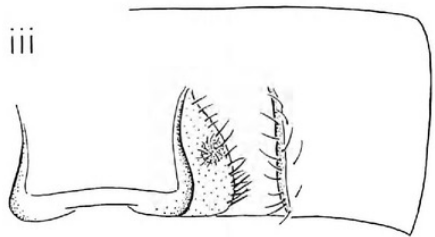
Pronotum 305 μ long, 310 μ wide. Elytron 435 μ long. Wingless. Protrochanter with short spine at inner posterior margin; profemur 97 μ ; protibia with minute subapical spine. Mesotrochanter simple; mesofemur 97 μ wide; mesotibia simple. Metafemur 90 μ wide.

First visible tergite 302 μ wide at base, without basal carinae on I or II. Sternite II simple; III with prominent lateral depressions on each side of midline; IV with deep depressions continuous with III, V with distal margin expanded, extension with circular depression; VI with shallow median emargination; VII a penial plate 197 μ long, 44 μ wide. Aedeagus 155 μ long, 87 μ deep.

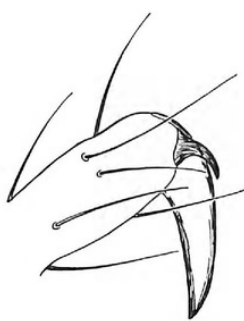
GEOGRAPHIC DISTRIBUTION.—Oregon: Benton County: 1 ♀, 4 miles S. Blodgett, Douglas-fir litter, 26 March 1959, B. D. Ainscough. Coos County: 2 ♂, 4 ♀, Charleston, assorted litter including *Polystichum* and *Tsuga*, 1 October 1959, V. D. Roth. 2 ♂, N. Bridge, 27 July 1957, V. D. Roth. Curry County: 2 ♀, 5 miles N. Brookings, 1 October 1959, V. D. Roth. Lane County: 4 ♂, 5 ♀, nr. Florence, 21



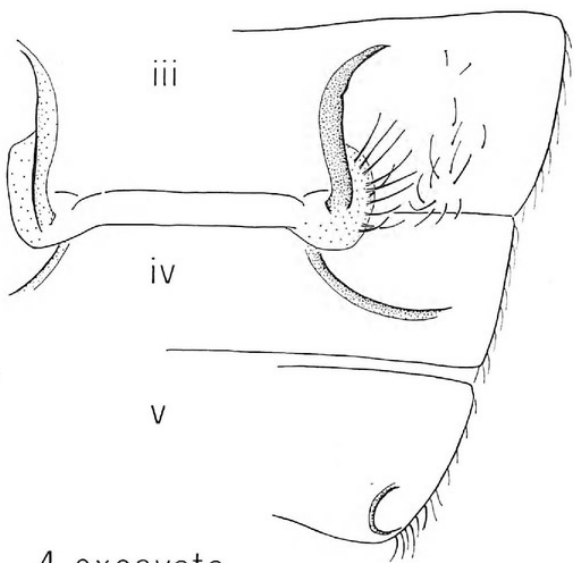
1 multifossa



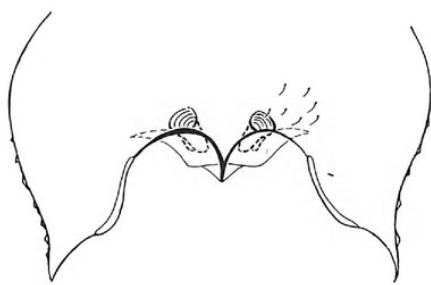
3 clavicornis



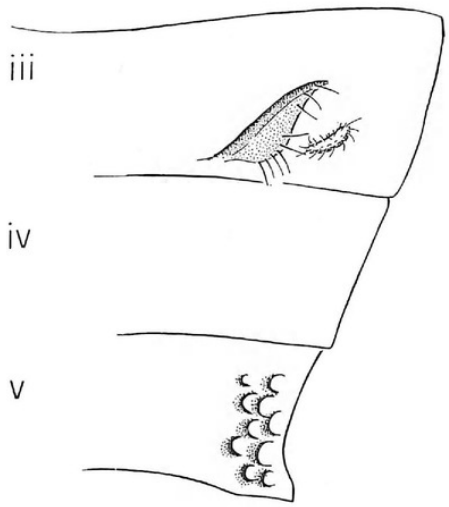
2 multifossa



4 excavata



6 excavata



5 multifossa

August 1961, W. Suter. 1 ♂, nr. Belknap Springs, debris, 4 June 1957, H. S. Dybas. Linn County: 3 ♂, 1 ♀, Clear Lake near Santiam Pass, log, and floor litter, 20 August 1961, W. Suter. Washington County: 1 ♂, 6 miles E. Buxton, 6 April 1965, V. D. Roth.

DISCUSSION.—A specimen from Charleston, Oregon (type locality), was used for the redescription of this species. The holotype is probably in the collection of K. M. Fender. The males are easily recognized by the modifications of sternite III. The basal abdominal carinae are not present on specimens from Charleston, Oregon, but they are present on a male and female from Clear Lake, Oregon, which are considered conspecific. The sclerotized structures of the female genitalia (fig. 9) show four pores present at the base for *C. excavata*, and 12 pores for *C. clavicornis*.

CUPILA CLAVICORNIS (Mäklin)

(Figs. 3, 11)

Trimium clavicorne Mäklin, 1852, Bull. Moscou, 25: 371–372.

Cupila clavicornis (Mäklin). Casey, 1897, Ann. N. Y. Acad. Sci., 9: 561.

MALE (slide).—Head 200 μ long, 225 μ wide; vertexal foveae 100 μ between centers; ventral surface with 16 capitate setae; eyes moderate. Antenna 335 μ long; segments I + II 85 μ long, 38 μ wide; III to VI inclusive, 70 μ long, 22 μ wide; VII 20 μ long, 25 μ wide; VIII 20 μ long, 35 μ wide; IX 25 μ long, 48 μ wide; X 27 μ long, 55 μ wide, asymmetrical; XI 92 μ long, 70 μ wide; XI as long as preceding 5.

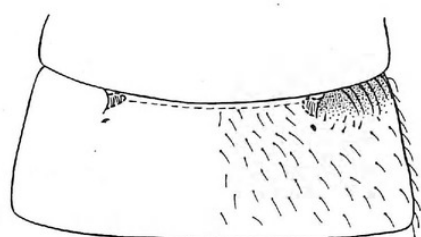
Pronotum 275 μ long, 272 μ wide. Elytron 385 μ long. Wingless. Protrochanter with spine at inner posterior margin; profemur 75 μ wide; protibia with minute subapical spine. Mesotrochanter simple, mesofemur 75 μ wide; mesotibia simple. Post mesocoxal foveae with apodemes directed obliquely forward. Metafemur 65 μ wide.

First visible tergite 260 μ wide at base, with faint basal carinae 10 μ long, separated by 77 μ . Sternite II unmodified; III (fig. 3) with deep longitudinal depression on each side of center and narrow setate carina laterally; IV with slight depression continuous with III; V with narrow foveate depression near extended posterolateral margin; VI transverse apically, with slight median emargination; VII a penial plate 105 μ long, 54 μ wide. Aedeagus (fig. 11) 190 μ long, 90 μ deep.

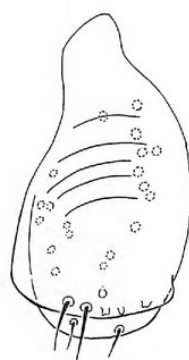
GEOGRAPHIC DISTRIBUTION.—Washington: Calallam County: 1 ♂, 4 ♀, 2 miles E. Lapush Indian Reservation, coniferous litter, 9 July 1959, L. M. Smith, 3 ♂, 1

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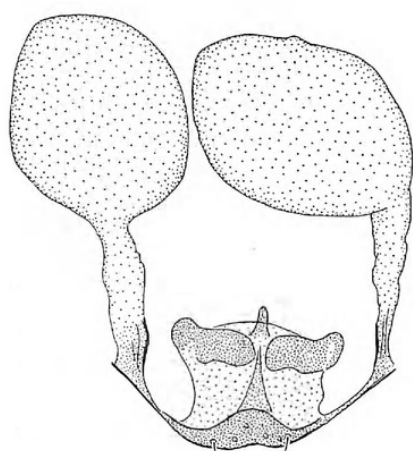
Fig. 1. *Cupila multifossa* new species, antennal club, dorsal (holotype). Fig. 2. *Cupila multifossa* new species, primary and secondary metatarsal claws (holotype). Fig. 3. *Cupila clavicornis* (Mäklin), sternite III, right side. Fig. 4. *Cupila excavata* Park and Wagner, sternites III–V, right side. Fig. 5. *Cupila multifossa* new species, sternites III–V, right side (paratype). Fig. 6. *Cupila excavata* Park and Wagner, prosternum with precoxal foveae.



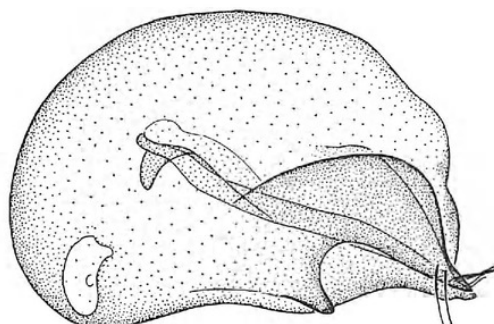
7 excavata



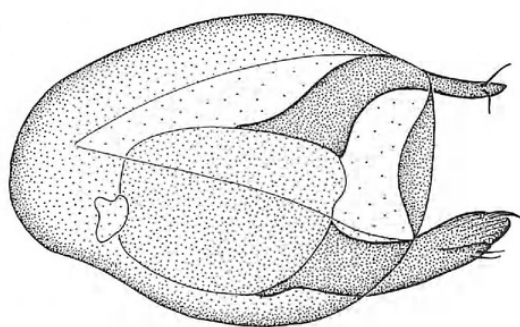
8 excavata



9 excavata



10 excavata



11 clavicornis

Fig. 7. *Cupila excavata* Park and Wagner, sternite II. Fig. 8. *Cupila excavata* Park and Wagner, penial plate. Fig. 9. *Cupila excavata* Park and Wagner, sclerotized structures of female genitalia. Fig. 10. *Cupila excavata* Park and Wagner, male genitalia, right lateral (dorsal *in situ*). Fig. 11. *Cupila clavicornis* (Mäklin), male genitalia, eversible internal structures not shown, dorsal (left lateral *in situ*).

♀, Olympic Hot Springs, bark chips and wet floor pocket, 16 August 1961, W. Suter. Grays Harbor County: 2 ♂, 4 miles N. Amanda Park, 9 July 1959, L. M. Smith. Mason County: 1 ♂, Lake Cushman Dam, 7 July 1959, L. M. Smith. Pierce County: 1 ♂, 1 ♀, Mt. Ranier National Park (at Carbon R.), litter on and near log, 16 July 1957, H. S. Dybas; 1 ♂, 2 ♀, Longmire Campground, 17 August 1961, W. Suter. Spokane County: 2 ♀, Mt. Spokane, Bald Knob, conifer duff, 4500 ft. elev., 22 June 1957, H. S. Dybas.

DISCUSSION.—The prominent carinae on either side of the excavation of sternite III readily separate males of *C. clavicornis* from the closely related males of *C. excavata*. All females observed have had basal abdominal carinae. The holotype was not examined and the redescription is based on a specimen identified by O. Park.

Cupila multifossa Grigarick and Schuster, new species

(Figs. 1, 2, 5)

MALE (slide).—Head 217 μ long, 255 μ wide; vertexal foveae 112 μ between centers; ventral surface with 14 capitate setae; eyes moderate. Antenna 345 μ long; segments I + II 90 μ long, 40 μ wide; III to VI inclusive 75 μ long, 30 μ wide, VII 18 μ long, 33 μ wide; VIII 18 μ long, 35 μ wide; IX 18 μ long, 45 μ wide; X 30 μ long, 63 μ wide, asymmetrical; XI 90 μ long, 77 μ wide; XI as long as preceding 4 segments.

Pronotum 285 μ long, 318 μ wide. Elytron 390 μ long. Apterous. Protrochanter with short, thick spine on median posterior margin; profemur 75 μ wide; protibia with minute subapical spine. Mesotrochanter simple; mesofemur 75 μ wide; mesotibia simple; metafemur 80 μ wide.

First visible tergite 320 μ wide at base; basal carinae 23 μ long, separated by 77 μ . Sternite II unmodified; III with large inner and smaller lateral setate projections; IV simple; V with distal margin expanded laterally and bearing numerous foveate structures; VI weakly sinuate; VII a penial plate 73 μ long, 45 μ wide. Aedeagus 170 μ long, 88 μ deep.

GEOGRAPHIC DISTRIBUTION: The *holotype male*, 1 paratype male and two paratype females were collected at FRESHWATER, HUMBOLDT COUNTY, CALIFORNIA, in redwood litter, 13 August 1953 by Gordon A. Marsh and Robert O. Schuster.

Both males (dissected) and both females (whole mounts) are mounted on slides in Hoyer's. The specimens are deposited in the collection of the Department of Entomology, University of California, Davis.

DISCUSSION.—The obliquely oriented carinae of sternite III, and the lateral projections and numerous lateral fossae of sternite V distinguish the males of this species. The basolateral margins of the pronotum of both sexes are smooth, while these margins on *C. clavicornis* and *C. excavata* are tuberculate.

LITERATURE CITED

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A New Australian *Microdon* with a Name Change

(Diptera : Syrphidae)

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A new species and a new name are proposed for two Australian *Microdon* flies. The new species of *Microdon* was noted while conducting an investigation into the generic classification of the Microdontinae. The identification of this new form led to the discovery of a senior primary homonym for another Australian species. *Microdon modestus* Ferguson is preoccupied by *Microdon modestus* Knab, described from North America, thus I proposed the name *M. fergusoni* for this Australian species.

Microdon fergusoni Thompson, new name

Microdon modestus Ferguson, 1927, Proc. Linn. Soc. N. S. Wales, 51: 170, not Knab, 1917, Proc. Biol. Soc. Wash., 30: 139.

Microdon browni Thompson, new species

Face yellow; cheeks brown; front, vertex, and occiput black. Antennae longer than face; third segment more than twice as long as first, twisted longitudinally and swollen basally. Thorax mostly dark brown, scutellum unarmed. Legs mostly orange, femora brown except for the apices. Abdomen orange.

MALE.—*Head*: (fig. 1) Face yellow with white pile; cheeks and edge of the epistoma brown with white pile; front black except for a small orange spot above the antennal bases, with golden and black pile intermixed; vertex black, with golden and black pile intermixed; occiput black except for two large yellowish white spots behind the cheeks, with white pile below becoming yellower above. Face with slightly convergent sides, widest at oral margin; front short, about one-sixth as long as face, narrowest at the constriction between the front and vertex, about one-half the greatest width of the face at this point; vertex four times as long as front, not produced and as wide as the face at the posterior margins of the eyes; ocellar triangle roughly equilateral, occupying about one-fourth the width of the vertex. Antennal ratio: 5 : 1 : 12.5. Antennae dark brown except for



Grigarick, Albert A. and Schuster, R O. 1968. "A revision of the genus *Cupila* Casey (Coleoptera: Pselaphidae)." *The Pan-Pacific entomologist* 44, 38-44.

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