

REVISION OF THE NEARCTIC SPECIES OF *METACLISIS* FOERSTER
(HYMENOPTERA, PLATYGASTRIDAE, INOSTEMMATINAE)

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Abstract

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The Nearctic species of the genus *Metaclisis* are revised. Of 18 species recognized, 16 of them new to science as follows: *M. acericola* (Quebec, Ontario), *M. acerina* (Quebec, Ontario, Illinois), *M. aceris* (Quebec, Ontario), *M. acuta* (Arizona), *M. alticola* (New Mexico), *M. annae* (Texas), *M. attenuata* (California), *M. borealis* (Labrador), *M. ensifer* (California), *M. filicornis* (Ontario), *M. longula* (Illinois, Maryland, Ontario), *M. masoni* (Manitoba), *M. pumilio* (Ontario, Quebec, Illinois, Maryland, N. and S. Carolina), *M. sulcata* (Eastern Canada and U.S.A., Tennessee), *M. verna* (Ontario), and *M. vernalis* (Quebec, Ontario, Maryland). *M. carinata* (Ashmead) ♂ and *M. floridana* (Ashmead) ♀ are redescribed and the male of *M. floridana* is newly described. A generic diagnosis of *Metaclisis* and keys to females and males of Nearctic species are given. The higher classification, bionomics, world distribution, and character states of *Metaclisis* species are discussed.

Résumé

L'auteur révisé les espèces néarctiques du genre *Metaclisis*. Parmi les 18 espèces reconnues, 16 sont nouvelles, soit *M. acericola* (Québec, Ontario), *M. acerina* (Québec, Ontario, Illinois), *M. aceris* (Québec, Ontario), *M. acuta* (Arizona), *M. alticola* (Nouveau Mexique), *M. annae* (Texas), *M. attenuata* (Californie), *M. borealis* (Labrador), *M. ensifer* (Californie), *M. filicornis* (Ontario), *M. longula* (Illinois, Maryland, Ontario), *M. masoni* (Manitoba), *M. pumilio* (Ontario, Québec, Illinois, Maryland, Caroline du Nord et du Sud), *M. sulcata* (est du Canada et des États-Unis, Tennessee), *M. verna* (Ontario) et *M. vernalis* (Québec, Ontario, Maryland). *M. carinata* (Ashmead) et *M. floridana* (Ashmead) sont redécrits et le mâle de *M. floridana* est décrit pour la première fois. L'auteur présente un diagnostic générique *Metaclisis* et des clefs d'identification des femelles et des mâles de certaines espèces néarctiques. Il étudie la classification supérieure, la répartition mondiale et la manifestation des caractères d'espèces de *Metaclisis*.

The genus *Metaclisis*, proposed by Foerster (1856), remained misinterpreted in North America until 1967 (Muesebeck and Masner). Ashmead's (1887, 1888, 1893) concept of *Metaclisis* was blurred with several genera of both the Inostemmatinae and Platygasterinae. Thus his *Metaclisis belonocnema* and *Metaclisis erythropus* belong to *Inostemma* Haliday and *Platygaster* Latreille respectively, whereas the true Nearctic species of *Metaclisis*, viz. *floridana* and *carinata* were described by Ashmead in *Acerota* auct. nec Foerster and *Monocrita* Foerster respectively (Muesebeck and Masner 1967; Masner and Muesebeck 1968).

The members of *Metaclisis* may be recognized among all genera of the Inostemmatinae by having cheeks with strong fan-like striae, and by the presence of a rudimentary basal vein in fore wing, and at least partly extruded and fully sclerotized apices of ovipositor sheaths in the female. The striate cheeks seem to be the most reliable character as the basal vein may be very pale to almost inconspicuous in some species and the sheaths are often retracted into the metasoma. The striate cheeks will also distinguish *Metaclisis* in South America from *Proplatygaster* Kieffer, the members of which also have better developed wing venation.

Eurostemma Szélnyi may be congeneric with *Metaclisis*; however, I was not able to examine the type of *Inostemma europus* Walker, the type-species of the

former genus. Kozlov (1970) proposed a monotypic tribe to accommodate *Metaclisis* in the system of the Inostemmatinae. He stressed the presence of the basal vein and the forked apex of the submarginal vein in the fore wing, i.e. characters occurring also in several undescribed inostemmatine genera not related to *Metaclisis*. I prefer not to use tribal names in the Inostemmatinae until the subfamily is better studied.

The present world distribution of *Metaclisis* comprises the entire temperate zone of both the Palearctic and Nearctic regions, the mountains of Central and South America, and the temperate zone of South America. Several species were described from Europe (Kieffer 1926; Maneval 1936; Debauche 1947; Tomšik 1950; Szabó 1959), two from North America (Ashmead 1887, 1893) and one from Chile (Walker 1842). Szabó (1959) also reported an undescribed species from Argentina. I have examined an abundance of exotic material of *Metaclisis* in the Canadian National Collection (CNC). Numerous undescribed species were collected from central Mexico to Costa Rica, Honduras, Jamaica, Colombia, Ecuador, Peru, and Chile. The species in tropical regions were confined to higher altitudes, montane rain forest, cloud forest, elfin forest, or eventually the paramo formation near the equator. An interesting correlation exists between wing development and altitude among the Neotropical species of *Metaclisis*. The first response to higher altitude is the infuscation of the wings (cloud forest), next is a stronger infuscation combined with abnormally enlarged wings (elfin forest), and finally microptery or loss of wings with a simultaneous reduction of the pterothorax and massive development of the hump between T1 and T2 (paramo region).

The hosts of *Metaclisis* are not known but are believed to be gall forming species of the Cecidomyiidae. Mr. H. J. Vlug (Wageningen) (*in litt.*) reared in Holland an undescribed species from cecidomyiid larvae in flowers of birch (*Betula* sp.). During my field work in 1979-1980 I associated several Nearctic species of *Metaclisis* with sugar maple (*Acer saccharum* Marsh.) by observing adult wasps on leaves in the second half of May in Ontario and Quebec. Here they could be easily swept in large numbers along with two vernal species of *Acerotella* Msn. (Masner 1980b). Other records involving Nearctic *Metaclisis* show species of oak (*Quercus*), willow (*Salix*), and goldenrod (*Solidago*) as potential associations. All of these plants are hosts of many species of Cecidomyiidae. The majority of the Nearctic species of *Metaclisis* appear in spring; during March-April in the Lower Austral, May in the Transitional and Canadian, and June-July in the Hudsonian zones respectively. So far only species, viz. *M. sulcata* n. sp. (associated with goldenrod) was recorded only in summer and fall.

Individuals of *Metaclisis* are rare in collections (e.g. Szabó 1959). However, during only 2 years I was able to amass some 400 individuals representing numerous undescribed species. The alleged rarity of these wasps is possibly caused by two interesting biological phenomena, viz. an apparent short life span of the adults and their rigid adherence to respective host plants. While observing the habits of the complex associated with sugar maple in Quebec and Ontario, I noticed that the adults appeared, peaked and disappeared usually within a week, the males always preceding the females in appearance. This seems to be an ecological correlation well synchronized with a rather rapid postembryonic development of the presumed host, *Dasineura* sp. (? *communis* Felt), the galls of which will develop, mature, and drop off the leaves within 2 weeks (R. Gagné, USDA, Washington, pers. comm.). Both the host and the parasite will not appear again until the next spring. Thus the adult wasps may be encountered only once a year during a very short period. Furthermore, the adult wasps seem to be strictly confined to their niche, i.e. the leaves of the host plant. When disturbed by sweeping they fly around very little,

returning soon to the original site. I failed to catch them with either Malaise or pan traps, even in situations where the traps were set right next to host plants. Sweeping of respective host plants at daily intervals during the short flight period of each species is the only productive method of collecting members of *Metaclisis*.

The 18 Nearctic species, based on some 400 individuals treated in this paper, certainly do not represent the entire North American fauna. The relatively high number of species based on single specimens or short series indicates that much is left to be discovered in this genus. More species are likely to be found mainly in the southern parts of the U.S.A. The use of mass collecting methods (e.g. screen-sweeping) as well as observance of individual wasp-plant associations should be pursued. Host records through rearings are the ultimate goal for correct association of sexes. Unfortunately, at this moment only seven Nearctic species are known from both sexes. The considerable degree of sexual dimorphism in *Metaclisis* precludes ready association of sexes.

A classification of the 18 Nearctic species into species groups is not attempted at the present time. It will be postponed until a more complete picture of the genus is achieved, with more biological data, etc. However, the three vernal species associated with sugar maple (viz. *M. acericola* n. sp., *M. acerina* n. sp., and *M. aceris* n. sp.) appear to form a distinct group. The unusually long scape in females and the predominant golden colour of antennae and legs in both sexes are quite remarkable.

The proper gender of *Metaclisis* is feminine as explicitly mentioned by Foerster (1856: 106, footnote **). The subsequent use of a masculine gender by some authors (e.g. Muesebeck and Walkley 1956, Hellén 1968, Kozlov 1978) is incorrect.

Character states, measurements, and abbreviations. The Nearctic members of *Metaclisis* appear to be a morphologically very homogeneous complex. Relatively few characters appear to be diagnostic, and such as the antennae are highly dimorphic sexually. Therefore, separate keys to females and males are necessary. Useful cephalic characters appear to be the following: general shape and length/width ratio of head, with cephalic measurements from dorsal view (head termed transverse if wider than long); mutual ratios of eye height, interorbital space, and length of scape, where eye height is measured from lowermost to uppermost point of the orbit, the interorbital space is the shortest distance between inner orbits, and the length of scape is measured excluding the radicle. All three measurements are to be done from frontal view. If flexed to the frons the scape may either attain or exceed the vertex (in lateral view). The female antenna offers excellent specific characters, among them the length/width ratio of A3, the type of clava (semiabrupt to abrupt) depending on shape of A7, and the location of sensilla on segments of the clava. The male antenna shows relatively less variation; however, the shape of A4 might be exploited later when males are known in most species.

The mesosoma offers relatively few diagnostic characters except in three species where the notauli are quite distinctive. The maximal width of mesosoma is measured across the mesoscutum right in front of the tegulae (tegulae are not included as they are partly movable).

The metasoma in the female is of importance second only to the antennae. General shape, length/width ratio of T2, sculpture of T1 and T2, presence or absence of the hump between T1 and T2, shape of T6 and relative length of S6 compared to length of S3-S5 combined are the most useful characters. However, caution must be exercised in subteneral or poorly preserved specimens in which the metasoma tends to shrink, upsetting the measurements readings. Similarly, the ovipositor sheaths may be retracted or extruded even in normal specimens.

The measurements are figured in direct readings of an ocular scale at 160×; they represent fractions of 1 mm, with 100 equal to 1 mm. Direct readings are preferred over the x:1 ratios in order to permit mutual comparisons of length and width of individual parts of the body (e.g. length of scape vs. length of T2).

The morphological terms and their respective abbreviations used in this paper are those proposed by Masner (1980a). Measurements of antennal segments given in "relative proportions" refer to maximal length divided by maximal width of the object.

The abbreviations of museums are as follows:

- CNC — Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa
- MSU — Michigan State University, East Lansing
- USD — University of California, Davis
- UM — Université de Montréal, Montréal
- USNM — United States National Museum of Natural History, Washington, D.C.

Metaclisis Foerster

1856, *Metaclisis* Foerster, Hymenopterologische Studien 2: 106.

Type-species: *Inostemma areolata* Haliday. Designated by Foerster (1856).

1914, *Parinostemma* Kieffer in André, Spec. Hym. Eur., 11: 355. Synonymized by Masner (1965).

Moderately to distinctly elongate forms, with body sometimes slightly depressed dorsoventrally. Head transverse, subellipsoidal, rarely subrectangular; cheek with fan of striae radiating from base of mandible and reaching sometimes to lower frons; subocular suture and a corresponding keel between lower orbit and base of mandible present or obscured by striae; mandible bidentate; palpal formula 2-1; clypeus rather narrow, protruding in some species; ocelli in low triangle, OOL shorter than both LOL and POL; eye at least sparsely hairy, in some species with dense erect hairs; occipital carina well developed, often crenulate along inner side; occipital pit absent; antennal formula 10-10, in female clava moderately to strongly abrupt, 3-4 segmented, rarely clava indistinct, in male A4 with outer carina and/or apical-outer corner expanded; notauli percurrent, often dilated posteriorly, strongly converging in front of scutellum; scutellum almost semicircular, with posterior margin rounded, with distinct row of crenulae along anterior margin; mesopleuron with deep declivity in lower half, almost smooth and glabrous; sternaulus absent; acetabular carina well developed; metapleuron always pubescent; metanotum not protruding medially, usually smooth and glabrous; propodeum pubescent, with ^-shaped keel medially; fore wing with long submarginal vein distinctly knobbed apically, knob more or less forked, often suffused with surrounding infuscation; basal vein usually faint, indicated at most as a darker pigmented streak; medial, radial, and cubital veins rarely indicated as darker lines; marginal cilia very short; hind wing with a short stub of submarginal vein; tarsal formula 5-5-5; tibial spur formula 1-2-2; metasoma in females moderately to strongly elongate, at least as long as head and mesosoma combined, with 6 visible tergites and 6 sternites, T1 without horn but often humped at junction with T2, T6 triangular, pointed at apex, ovipositor sheaths at least partly exposed and sclerotized; metasoma in males with 7 visible tergites.

KEY TO NEARCTIC SPECIES OF *Metaclisis*

Females

1. S6 distinctly longer than S3-S5 combined, nearly sword-like; metasoma with distinct hump at junction of T1 and T2 2
- S6 at most as long as S3-S5 combined, triangular; metasoma usually flat at junction of T1 and T2, rarely with a hump (as in *annae*, *attenuata*, and *longula*) 4
2. Frons below anterior ocellus entirely sculptured, rugulose-punctate; T2 with striae extending at least to middle of tergite; fore wing reaching to base of T6 only; Manitoba 1. *M. masoni* n. sp.
- Frons below anterior ocellus partly smooth, with some coriaceous sculpture; T2 with short striae not exceeding the basal quarter of tergite; fore wing reaching to apex of T6 3
3. Notauli narrow, as wide as deep, not dilated posteriorly; OOL almost twice as long as ocellar diameter; A4 only slightly shorter than A3 (3.5:4); hind basitarsus distinctly shorter than tarsi 2-5 combined (15:25); Arizona 2. *M. acuta* n. sp.
- Notauli wider than deep, dilated posteriorly; OOL only slightly longer than ocellar diameter; A4 distinctly shorter than A3 (4:6); hind basitarsus only slightly shorter than tarsi 2-5 combined (25:28); California 3. *M. ensifer* n. sp.
4. Antenna very slender, almost filiform, with no distinct clava (Fig. 6), A9 2.5 times as long as wide; only A9 and A10 with sensilla; Ontario 4. *M. filicornis* n. sp.
- Antenna stouter than as above, clavate, clava more or less distinct (e.g. Figs. 1-5, 7-10), A9 at most 1.5 times as long as wide, usually much shorter or even transverse; A7-A10 or A9-A10 with sensilla 5
5. A1 (without radicle) distinctly longer than interorbital space 6
- A1 (without radicle) at most as long as interorbital space 9
6. A5 as long as wide (Fig. 9); scape in lateral view (when flexed to frons) with apex slightly surpassing level of vertex; legs predominantly brownish; Quebec, Ontario 5. *M. vernalis* n. sp.
- A5 slightly to distinctly elongate (Figs. 1-3); scape in lateral view (when flexed to frons) with apex distinctly surpassing level of vertex; legs predominantly golden-yellow 7
7. Frons below anterior ocellus entirely sculptured, finely coriaceous; T2 with striae reaching at meson at least to middle of tergite; A10 with sensillum well below apex (Fig. 3); Quebec, Ontario 6. *M. acericola* n. sp.
- Frons below anterior ocellus at least partly smooth; T2 with striae rarely exceeding at meson the basal third of tergite; A10 with sensillum almost at apex (Figs. 1-2) 8
8. Antennae slender (Fig. 1), A9 1.8 times as long as wide; A8-A10 with sensilla; Quebec, Ontario, Illinois 7. *M. acerina* n. sp.
- Antennae stouter than above (Fig. 2), A9 only 1.2 times as long as wide; A7-A10 with sensilla; Quebec, Ontario 8. *M. aceris* n. sp.
9. T2 with striae extending medially almost to hind margin of tergite; notauli at bottom crenulate; length of body 1.5-2.5 mm; Florida to Ontario 9. *M. floridana* (Ashmead)
- T2 with striae not exceeding medially beyond basal half of tergite; notauli not crenulate at bottom; length of body usually less than 1.5 mm 10
10. A3 at least twice as long as wide 11
- A3 1.1-1.5 times as long as wide 12
11. Fore wings distinctly surpassing tip of metasoma; junction of T1 and T2 not humped; Labrador 10. *M. borealis* n. sp.
- Fore wings attaining tip of metasoma; junction of T1 and T2 with distinct hump; California 11. *M. attenuata* n. sp.
12. Head in dorsal view subrectangular, only 1.5 times as wide as long, with temples behind eyes not strongly receding; frons and scutellum predominantly smooth; length of body 0.8-1.2 mm; Ontario, S. Carolina, N. Carolina, Illinois 12. *M. pumilio* n. sp.

- Head not subrectangular, about twice as wide as long, with temples behind eyes strongly receding; frons and scutellum at least partly sculptured; length of body often greater than 1.2 mm 13
- 13. Notauli narrow, as wide as deep, not dilated posteriorly; wings with white pubescence; Ontario, New Brunswick, Tennessee, Michigan, Maine 13. *M. sulcata* n. sp.
- Notauli distinctly dilated in posterior half, and at bottom much wider than deep; wings with pubescence other than white 14
- 14. A9 wider than long (Fig. 10); T2 medially with striae reaching almost to basal half of tergite; Quebec, Ontario, New York 14. *M. verna* n. sp.
- A9 as long as wide or even longer; T2 medially with striae distinctly shorter than above 15
- 15. Fore wings distinctly surpassing tip of metasoma; junction of T1 and T2 not humped; T2 slightly wider than long; New Mexico 15. *M. alticola* n. sp.
- Fore wings at most reaching tip of metasoma; junction of T1 and T2 slightly humped; T2 distinctly longer than wide 16
- 16. T1 entirely costate; T2 anterolaterally with striae longer than T1; T2 only slightly longer than T3-T6 combined (48:40); A9 as long as wide; Ontario, Maryland, Illinois 16. *M. longula* n. sp.
- T1 predominantly smooth, with only minute costae along anterior margin; T2 anterolaterally with minute costae subequal to those on T1; T2 distinctly longer than T3-T6 combined (42:28); A9 slightly longer than wide (6:4.7); Texas 17. *M. annae* n. sp.

Males

- 1. T2 with striae extending medially almost to hind margin of tergite; notauli at bottom crenulate; length of body usually greater than 2 mm; Florida to Ontario 9. *M. floridana* (Ashmead)
- T2 with striae extending medially at most to basal half of tergite; notauli not crenulate at bottom; length of body usually smaller than 1.5 mm 2
- 2. Notauli narrow, as wide as deep, not dilated posteriorly; wings with white pubescence; Ontario, New Brunswick, Tennessee, Michigan, Maine 13. *M. sulcata* n. sp.
- Notauli distinctly dilated in posterior part, the furrow at bottom much wider than deep; wings with pubescence other than white 3
- 3. A9 wider than long 4
- A9 as long as wide or moderately elongate 5
- 4. A1 (without radicle) distinctly longer than interorbital space (30:26); Ontario, Quebec 5. *M. vernalis* n. sp.
- A1 (without radicle) distinctly shorter than interorbital space (21:25); District of Columbia 18. *M. carinata* (Ashmead)
- 5. A9 as long as wide; frons above antennal insertion at least partly smooth and highly shining; Quebec, Ontario, Illinois; morphologically indistinguishable males of 7. *M. acerina* n. sp.
- 8. *M. aceris* n. sp.
- A9 moderately elongate; frons evenly coriaceous and almost mat 6
- 6. T2 with striae reaching medially to basal half of tergite; Quebec, Ontario 6. *M. acericola* n. sp.
- T2 with only short striae along anterior margin, costae not longer than length of T1; Labrador 10. *M. borealis* n. sp.

1. *Metaclisis masoni* n. sp.

Female. Length 2.0 mm. Black; legs brown, with fore tibiae and tarsi yellowish brown; wings distinctly infuscate, with dark brown veins.

Head strongly transverse (25:50), with dense silvery pilosity, entirely sculptured; occiput with minute pustulae; occipital carina strong, complete, with distinct crenulae; vertex rugoso-coriaceous; upper part of frons ruguloso-punctate, lower part longitudinally rugulose; cheeks strongly striate; eye height, interorbital space, and scape in ratios 25:29:25; eyes densely

hairy; OOL as large as ocellar diameter; occipital carina strong, complete, with distinct crenulae; antenna short, massive, A1 (scape) not exceeding vertex at apex; clava not distinctly abrupt, 4-5 segmented; antennal segments in relative proportions (length:width) 25:5.5, 8:4, 4:3, 3:3, 4:4, 4:5, 4:6, 5:6.5, 5:6.5, 10:6.

Mesosoma as high as wide (45:45), with dense short silvery pilosity; mesoscutum coriaceous-punctate; notauli strongly convergent and distinctly dilated posteriorly, not crenulate at bottom; scutellum finely coriaceous; fore wing attains only to base of T6; basalis and proximal part of medialis distinctly pigmented; legs relatively short and stout, with hind basitarsus only 4.5 times as long as wide.

Metasoma elongate, distinctly longer than head and mesosoma combined (120:85), sharply pointed apically; junction of T1 and T2 humped; T1 with short costae in anterior half, with posterior half smooth; T2 with strong longitudinal striae reaching at sides at least to basal half of the tergite, striae less developed anteromedially; posterior half of T2 with very fine coriaceous sculpture (160 \times , seen at angle); T2 slightly shorter than T3-T6 combined (52:55); T3-T5 finely coriaceous, with at least two rows of dense silvery hairs each; T6 elongate, longer than wide (35:18), longer than T3-T5 combined (35:20), finely coriaceous in anterior third, almost smooth in posterior two-thirds, covered with scattered long silvery hairs; S6 longer than S3-S5 combined, entirely rugulose, with silvery hairs; ovipositor sheaths about as long as hind basitarsus.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16491), Canada, Riding Mt. National Park (Man.) 400 m, Dead Ox Creek, June 28 1979, by sweeping, W.R. Mason.

DISTRIBUTION. Manitoba.

BIOLOGY. Unknown.

REMARKS. The female of *M. masoni* is one of the most unusual among those of Nearctic species of *Metaclisis*. The rough sculpture of the head, dense silvery pilosity of the body, striation of T2, and shape of both T6 and S6 are truly unique combinations of character states. The species is named in honour of its collector, Dr. W. R. Mason (BRI, Ottawa).

2. *Metaclisis acuta* n. sp.

Female. Length 1.4 mm. Black; metasoma dark brown; legs brown, with trochanters, knees, and tarsi yellowish brown; wings almost clear.

Head transverse (19:36), with only sparse minute hairs; occiput, vertex and frons along inner orbits with fine coriaceous sculpture; frons between toruli and anterior ocellus almost smooth, shining, with extremely fine microsculpture (160 \times); eyes with sparse hairs; eye height, interorbital space and scape in ratios 18:22:22; OOL almost twice as large as ocellar diameter; occipital carina fine, though complete, with minute crenulae; antenna rather slender, with moderately abrupt 3-segmented clava; antennal segments in relative proportions (length:width) 22:4, 7:3, 4:2, 3.5:2, 3:2.5, 3:3, 3:4, 5:5, 5:5, 8:5.

Mesosoma slightly wider than high (35:30), with much sparser pilosity than in *M. masoni*; mesoscutum with fine coriaceous sculpture; notauli very fine, narrow, as deep as wide, not dilated posteriorly; scutellum with coriaceous sculpture finer than that in mesoscutum; fore wings attaining the tip of metasoma; basalis distinctly pigmented; legs relatively long and slender, with hind basitarsus distinctly shorter than tarsi 2-5 combined (15:25).

Metasoma elongate, distinctly longer than head and mesosoma combined (95:55), sharply pointed apically; junction between T1 and T2 humped; T1 with only minute costae along anterior margin, otherwise smooth; T2 with minute costae along anterior margin, with anterolateral foveae shallow, non-striated, and almost glabrous, with rest of the tergite smooth and mirror-like, the tergite longer than wide (43:35), longer than T3-T5 combined (43:15); T3-T5 with very fine coriaceous sculpture, with one row of hairs each; T6 smooth, distinctly elongate, longer than T3-T5 combined (23:15); S6 smooth, distinctly longer than S3-S5 combined (30:17); ovipositor sheaths as long as hind tibia.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16483), USA, Chiricahua Mts., Cochise Co., Rustler Park (AZ), 2500 m, by sweeping, August 5 1977, L. Masner.

DISTRIBUTION. Arizona.

BIOLOGY. Unknown.

REMARKS. The unusually long T6 and S6 in combination with narrow notauli and short costae on T2 will sufficiently characterize the female of this species among those of the Nearctic species of this genus. The name of this species refers (in Latin) to the sharply pointed apex of the metasoma.

3. *Metaclisis ensifer* n. sp.

Female. Length 1.8 mm. Black; metasoma dark brown; antennae and legs brown; wings slightly infuscate.

Head transverse (22:40), with dense silvery pilosity; occiput coriaceous, with minute pustulae; vertex and frons coriaceous; occipital carina strong, with only indistinct crenulae; eyes densely hairy; eye height, interorbital space and scape in ratios 18:23:26; OOL only slightly larger than ocellar diameter; antenna rather slender, with non-abrupt 3-segmented clava; antennal segments in relative proportions (length:width) 26:4.5, 9:3.5, 6:3, 4:3, 3:3, 3.5:3.5; 4:4.5, 7:6, 7:6, 10:5.

Mesosoma appreciably wider than high (42:37), with rather dense pilosity; mesoscutum and scutellum with fine coriaceous sculpture; notauli distinctly dilated posteriorly; fore wing attaining the tip of metasoma; basal vein well pigmented; legs very slender, long, hind basitarsus only slightly shorter than tarsi 2-5 combined (25:28).

Metasoma elongate, distinctly longer than head and mesosoma combined (115:70), sharply pointed apically; junction of T1 and T2 humped; T1 with very minute costae along anterior margin, otherwise smooth; T2 with short costae anteromedially, with longer costae anterolaterally, not exceeding the basal third of the tergite; anterolateral foveae of T2 hairy, rest of T2 smooth, with extremely fine coriaceous microsculpture (160×), the tergite longer than wide (53:40), longer than T3-T5 combined (53:19); T3-T5 with fine coriaceous sculpture, with one row of hairs each; T6 smooth, with numerous hairs, longer than T3-T5 combined (27:20); S6 finely coriaceous-punctate, longer than S3-S5 combined (35:20); ovipositor sheaths longer than hind basitarsus.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16488), USA, Lily Pond, Alpine Lake (Marin Co.), CA, February 8-15 1969, Malaise trap, D.D. Munroe.

DISTRIBUTION. California.

BIOLOGY. Unknown.

REMARKS. In structure of metasoma the female of *M. ensifer* comes close to those of both *M. acuta* and *M. masoni*. However, it differs from the former mainly by having the notauli dilated posteriorly and from the latter by sculpture of the frons, slender legs, etc. The name of this new species refers (in Latin) to sword-like shape of S6.

4. *Metaclisis filicornis* n. sp.

Fig. 6

Female. Length 1.3 mm. Black; legs and antennae brown; radicle, extreme base of A1, trochanters, knees, fore tibiae and all tarsi lighter, yellowish brown; wings almost clear, with submarginal vein pale.

Head transverse (21:37), with sparse silvery hairs; occipital carina complete, with minute crenulae; occiput with minute pustulae right above occipital carina, otherwise coriaceous; vertex and frons evenly coriaceous; cheeks with fan-like longitudinal sculpture, with sharp

keel running from lower orbit to base of mandible; eye height, interorbital space, and scape in ratios 19:21:25; eyes with short hairs; OOL as long as ocellar diameter; temples behind eyes strongly receding; antenna (Fig. 6) very slender, almost non-clavate, with A9 2.5 times as long as wide, with sensilla only on A9 and A10.

Mesosoma as high as wide (35:35), only slightly arched dorsally, with dense minute pilosity; mesoscutum with fine coriaceous sculpture; notauli distinctly dilated posteriorly, not crenulate at bottom; scutellum with coriaceous sculpture somewhat finer than in mesoscutum; fore wings reaching well to tip of metasoma; basal vein almost inconspicuous, very pale; other veins not indicated.

Metasoma as long as head and mesosoma combined (65:65), rather short and stout, not humped at junction of T1 and T2; T1 entirely costate; T2 slightly longer than wide (38:35), longer than T3-T5 combined (38:15), with strong longitudinal costae in anterior $\frac{1}{3}$ and finer longitudinal striae extending over the basal half; anterolateral foveae of T2 shallow, with few hairs; T3-T6 with delicate coriaceous sculpture and with one row of hairs each; T6 triangular, as long as wide (13:13); S6 shorter than S3-S5 combined (13:15); only extreme tips of ovipositor sheaths extruded.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16489), Canada, Rondeau Provincial Park (ON), May 31 1979, beating of young sugar maples, L. Masner; left antenna on slide.

DISTRIBUTION. Ontario.

BIOLOGY. Unknown. Possibly associated with sugar maple.

REMARKS. The female of *M. filicornis* is one of the most unusual among those of Nearctic species, with its antenna almost filiform, with no distinct clava, and with sensilla on A9 and A10 only. The Latin name of this species refers to its slender, almost thread-like antennae.

5. *Metaclisis vernalis* n. sp.

Fig. 9

Female. Length 1.5 mm. Black; coxae, middle and hind femora and most of the tibiae brown, apical $\frac{2}{3}$ of scape and clava (A7-A10) light brown, basal $\frac{1}{3}$ of scape, trochanters, knees and tarsi of all legs, fore femur and tibia yellowish; wings almost clear, submarginal vein in fore wing light brown.

Head transverse (23:45), with dense silvery pilosity; occiput rugulose-coriaceous; occipital carina strong, complete, with only few short crenulae; vertex and frons coriaceous, middle of frons with sculpture somewhat finer; genae with distinct short striae, with sharp keel running from lower orbit down to base of mandibles; eye height, interorbital space, and scape in ratios 20:25:30; eyes with dense hairs; OOL as long as ocellar diameter; temples behind eyes strongly receding; antenna (Fig. 9) with rather abrupt 4-segmented clava.

Mesosoma only slightly wider than high (43:41), moderately arched dorsally, with dense minute silvery hairs; mesoscutum with fine coriaceous sculpture; notauli distinctly dilated posteriorly, not crenulate at bottom; scutellum with sculpture finer than in mesoscutum; fore wings reaching to tip of metasoma; basal vein almost inconspicuous, pale, other veins not indicated.

Metasoma as long as head and mesosoma combined (75:75), rather short and stout, not humped at junction of T1 and T2; T1 entirely costate longitudinally; T2 longer than wide (40:35), distinctly longer than T3-T6 combined (40:17), with strong longitudinal costae in anterior $\frac{1}{3}$ and finer longitudinal striae extending slightly over its basal half; anterolateral foveae of T2 with dense hairs; T3-T6 with fine coriaceous sculpture and with one row of hairs each; T6 broadly triangular (7:19); S6 shorter than S3-S5 combined (10:15); ovipositor sheaths barely extruded.

Male. Differs from female in structure of antennae and metasoma. A4 strongly bent, with outer distal corner projecting; A6-A10 gradually thickened, almost subclavate; antennal

segments in relative proportions (length:width) 30:5.5, 10:4, 5:3, 5:7, 3.5:4.5, 4.5:5, 4.5:5.5, 5:6, 5:6, 10:6.5.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16495), Canada, Rondeau Provincial Park (ON), May 31 1979, by sweeping, L. Masner. Allotype: ♂, with same data as holotype (CNC). Paratypes: 6 ♀♀ 2 ♂♂, with same data as holotype (CNC, USNM); 4 ♀♀ Normandale (ON), May 26 1979, H. Goulet (CNC); 5 ♀♀ 3 km N. St. Williams (ON), May 24 1979, H. Goulet (CNC); 2 ♀♀ 1 ♂ Gatineau Park (PQ), May 14 & 18 1979, L. Masner; ♀ Patuxent Wildlife Center nr. Laurel (MD), May 16-25 1979, Malaise trap, M. Schauff (CNC).

DISTRIBUTION. Specimens were examined from Ontario, Quebec, and Maryland; however, the real range of this species is expected to be considerably wider in northeastern North America.

BIOLOGY. Unknown.

VARIABILITY. The body size varies between 1.0 and 1.5 mm. The smaller individuals tend to have sculpture of frons (between anterior ocellus and antennal insertion) very fine to almost partly smooth. Similarly, the striae on T2 are shortest in smallest individuals.

REMARKS. The female of *M. vernalis* is distinct in its antenna having a strongly elongate A3 in combination with moderately transverse segments of the clava. The male resembles to some extent that of *M. carinata* (Ashm.); however, it may be distinguished by having A1 distinctly longer than interorbital space.

6. *Metaclisis acericola* n. sp.

Fig. 3

Female. Length 1.25 mm. Body dark brown to black, head and mesosoma darker than metasoma; antenna bicolor, with radicle and A1-A7 bright golden yellow, and A8-A10 light brown; fore legs (including coxae) entirely golden yellow, middle legs light brown with golden coxae, hind legs including coxae light brown; mandibles and tegulae yellowish brown; wings slightly infuscate, with venation pale.

Head transverse (21:39), as wide as mesosoma across tegulae; vertex and occiput with coriaceous sculpture; frons with sculpture becoming finer immediately below anterior ocellus, lower frons above toruli with longitudinal concentric striae; cheeks heavily striate, however, striae not obscuring a strong keel connecting lower orbit of eye with base of mandibles; occipital carina strong, distinctly crenulate; clypeus prominent (in lateral view), with sharp anterolateral corners; eyes distinctly hairy; eye height interorbital space and scape in ratios 16:22:30; OOL as long as diameter of posterior ocellus; temples behind eyes (dorsal view) strongly receding; A1 (scape) when flexed to frons with apex distinctly surpassing vertex; antenna as in Fig. 3; A10 with sensillum well below apex.

Mesoscutum slightly wider than high (39:35), in lateral view only slightly arched dorsally; mesoscutum with coriaceous sculpture and scattered minute punctures; notauli percurrent, distinctly dilated in posterior half, not crenulate at bottom; scutellum with coriaceous sculpture; fore wing widely surpassing tip of metasoma; basal and median veins in fore wing very pale.

Metasoma only slightly longer than head and mesosoma combined (75:60), not humped at junction T1 and T2; T1 trapezoidal, twice as wide as long (20:10), longitudinally costate all over; T2 only slightly longer than wide (45:42), campanulate, with strong longitudinal costae at base and continuing longitudinal striae well over the basal half, with finer striation exceeding medially into posterior third of the tergite; T3-T6 almost smooth, with one row of silvery bristles each; ovipositor sheaths only partly exposed.

Male. Differs from female in following characters. Antenna uniformly golden yellow; A1 (scape) in lateral view (when flexed to frons) with apex not exceeding the level of vertex; A4 moderately expanded distally, with percurrent carina outwardly, however, outer apex of segment not hook-like expanded; A5-A9 slightly elongate (6:5), A10 twice as long as wide.

TYPE MATERIAL. Holotype; ♀ (CNC No. 16480), Canada, Gatineau Park (PQ), May 18 1979, by sweeping foliage of young sugar maples, L. Masner. Allotype: ♂, with same data as holotype (CNC). Paratypes: 40 ♀♀ 62 ♂♂, with same data as holotype (CNC, USNM); 13 ♀♀ 6 ♂♂ Rondeau Provincial Park (ONT.), May 31 1979, by sweeping foliage of young sugar maples, L. Masner (CNC); 4 ♀♀ as above but caught on June 2 1979 (CNC); ♀ near St. Williams (Ont.), May 24 1979, H. Goulet (CNC); ♀ Jockvale near Ottawa (Ont.) May 22 1951, swept from sugar maple leaf, O. Peck (CNC); ♀ near Kemptville (Ont.), May 24 1978, L. Masner (CNC); 4 ♀♀ Normandale (Ont.), May 26 1979, H. Goulet (CNC); ♀♂ Springwater Conservation Area, near Aylmer (Ont.), May 23 1979, H. Goulet (CNC).

DISTRIBUTION. Apparently a common and possibly a widespread species that presumably follows the range of sugar maple in NE North America. However, the relatively short flight period of the adult wasps and their habits (see Introduction) are the main reasons why this common species remained unnoticed until very recently.

BIOLOGY. The host is unknown but is presumed to be a common gall forming cecidomyiid associated with sugar maple, such as *Dasineura communis* Felt. Adult wasps were collected on maple leaves during a relatively short period, usually a few days in the second half of May. The wasps were caught in abundance by either sweeping or beating with a sheet on young seedlings or lower branches of sugar maple. The above biological features seem to be shared by two other Nearctic species of *Metaclisis* associated with sugar maple, viz. *M. acerina* n. sp. and *M. aceris* n. sp.

VARIABILITY. In specimens examined the total body length varies between 1.2 and 1.6 mm. The sculpture of frons (below anterior ocellus) tends to be coarser in larger, and finer in smaller individuals. Similarly, the striae on T2 are relatively longest in largest individuals and *vice versa*. The colouration of antennae and legs appears to be rather constant.

REMARKS. *M. acericola* n. sp. may be easily distinguished from both *M. acerina* n. sp. and *M. aceris* n. sp. by having a sculptured frons and longer striae on T2 in both sexes, and by the shape of A10 and the position of its sensillum in the female.

Individuals of *A. acericola* are also generally larger than those of the two above species. The Latin name of this new species indicates the close association with maple (*Acer*).

7. *Metaclisis acerina* n. sp.

Fig. 1

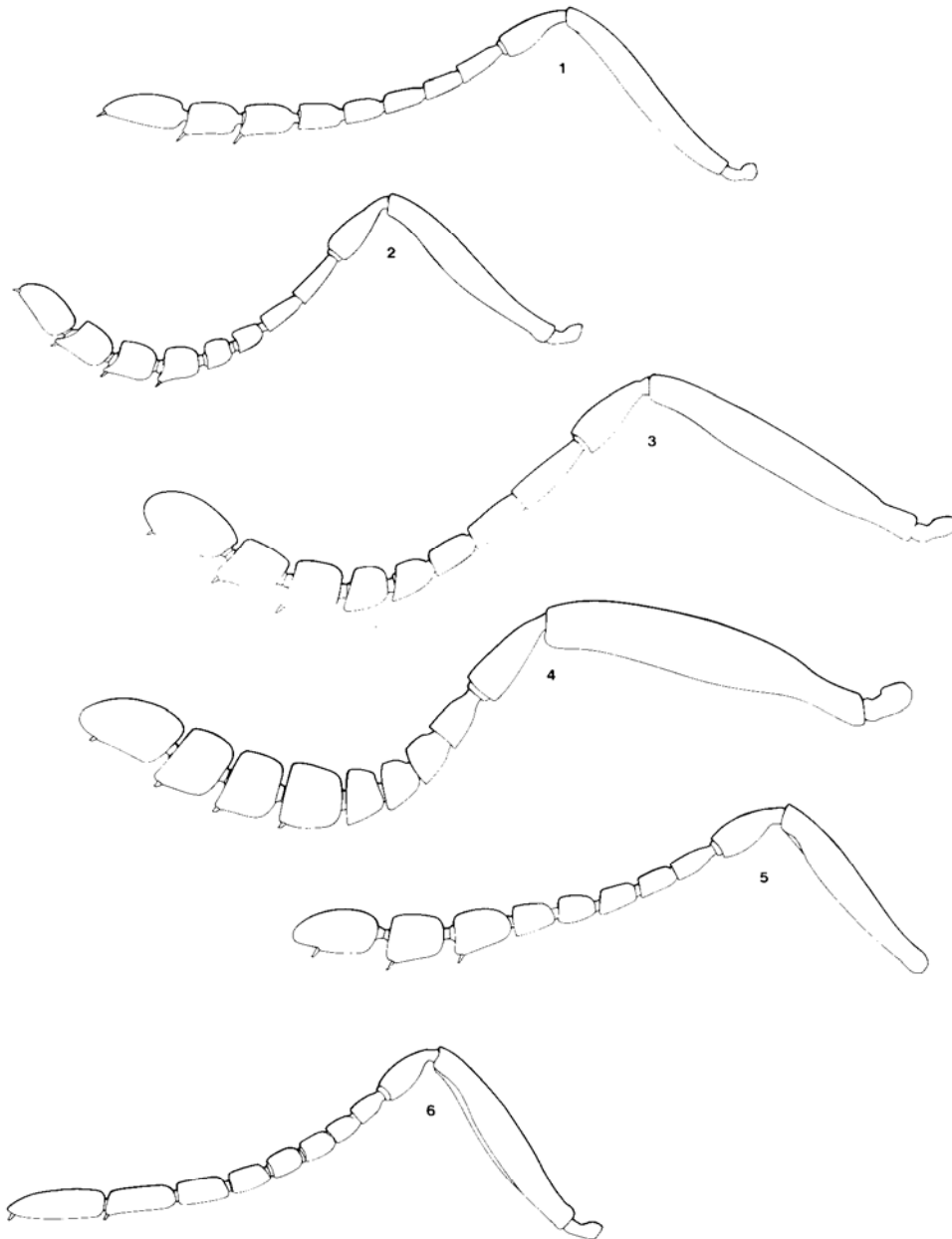
Female. Length 1.1 mm. Very similar to *M. acericola* n. sp. from which it differs only in following characters. Frons between antennal insertion (toruli) and anterior ocellus with large unsculptured area, smooth and distinctly shining (160×). A1 longer than interorbital space (25:19). Antenna (Fig. 1) with clava more slender, A10 more elongate, with sensillum almost at apex. T2 striate distinctly in anterior third of the tergite and with almost inconspicuous traces of striation beyond this point.

Male. The presumed males of this species cannot at present be distinguished from those of *M. aceris* n. sp. (over 60 males examined in CNC). However, they can easily be separated from those of *A. acericola* by having frons partly smooth and T2 with shorter striae.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16481), Canada, Gatineau Park, (PQ), May 14 1979, by sweeping foliage of young sugar maples, L. Masner. Paratypes: 14 ♀♀, with same data as holotype but some collected on May 18 and 20 (CNC); 3 ♀♀ Jockvale near Ottawa (Ont.), May 22 1951, by sweeping of leaves of sugar

maple, O. Peck (CNC); ♀, USA, Mahomet Hartwood (Champaign Co., Ill.), May 20-26, S. & J. Peck (CNC).

DISTRIBUTION. Specimens were examined from western Quebec, Ontario, and Illinois. The probable range of this species is expected to be similar to that of *M. acericola*.



FIGS. 1-10. Female antennae of Nearctic *Metaclisis* spp. 1, *M. acerina* n. sp. 2, *M. aceris* n. sp. 3, *M. acericola* n. sp. 4, *M. floridana* (Ashmead). 5, *M. borealis* n. sp. 6, *M. filicornis* n. sp. 7, *M. longula* n. sp. 8, *M. pumilio* n. sp. 9, *M. vernalis* n. sp. 10, *M. verna* n. sp.

BIOLOGY. Field data indicate a similar presumed host as in *M. acericola*.

VARIABILITY. Only little variation in body size has been observed. Some individuals have legs, scape, and distal half of antenna light brown. In some individuals the striae on T2 do not reach the basal third of the tergite, while in others they slightly exceed that line.

REMARKS. This species may be distinguished from *M. aceris* n. sp. only in the female sex: the antenna is generally more slender in *M. acerina*, with A5-A9 distinctly elongate, and only A8-A10 have sensilla. The name of this species indicates the close association with maple (*Acer*).

8. *Metaclisis aceris* n. sp.

Fig. 2

Female. Length 1.1 mm. Very similar to *M. acerina* n. sp. from which it differs only in structure of antennae, that is generally stouter, with A5-A9 only slightly elongate, with sensilla on A7-A10.

Male. Presumed males of this species cannot at present be distinguished from those of *M. acerina*.

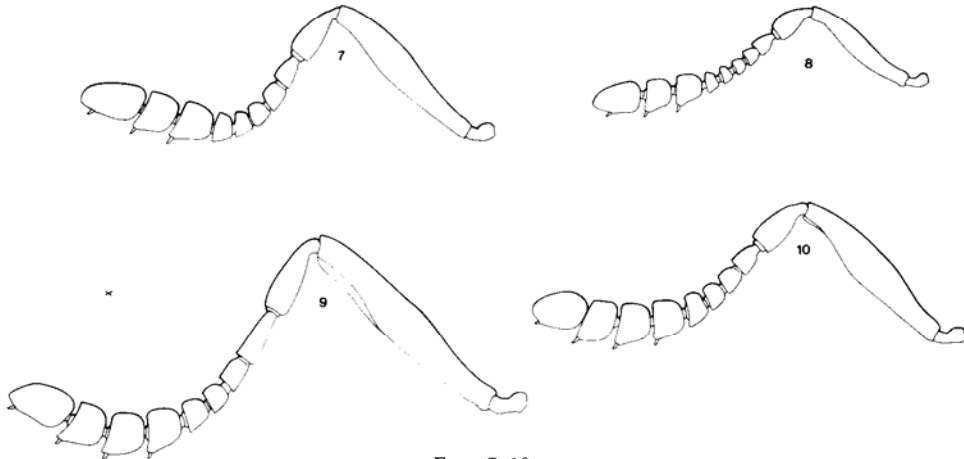
TYPE MATERIAL. Holotype: ♀ (CNC No. 16482), Canada, Gatineau Park (PQ), May 18 1979, by sweeping foliage of young sugar maples. Paratypes: 13 ♀♀, with same data as holotype but some caught on May 14 (CNC); ♀ Jockvale near Ottawa (Ont.), May 22 1951, swept from leaves of sugar maple, O. Peck (CNC); ♀ Springwater Conservation Area near Aylmer (Ont.), June 3 1979, L. Masner (CNC); ♀ Rondeau Provincial Park (Ont.), May 31 1979, by beating young sugar maples, L. Masner (CNC).

DISTRIBUTION. Specimens were examined from Quebec and Ontario but the presumed range of *M. aceris* will probably cover that of both *M. acericola* and *M. acerina*.

BIOLOGY. The host is unknown. Field data indicate a cecidomyiid host associated with sugar maple as with the two preceding species.

VARIABILITY. In specimens examined the body size varies between 9.0 and 1.3 mm.

REMARKS. *M. aceris* may be distinguished from *M. acerina* only in the female sex by characters mentioned in both the key and the description above. The name of this species indicates the close association with maple (*Acer*).



Figs. 7-10.

9. *Metaclisis floridana* (Ashmead)

Fig. 4

- 1887 *Acerota floridana* (!) Ashmead, Can. Ent. 19: 128.
 1893 *Acerota floridana*: Ashmead, Bull. U.S. natn. Mus. 45: 261.
 1926 *Acerota floridana*: Kieffer, Das Tierreich, 48: 577.
 1951 *Acerota floridana*: Muesebeck and Walkley, in Muesebeck *et al.*, Hymenoptera of America north of Mexico, Synoptic Catalog, Agriculture Monogr. 2, p. 707.
 1967 *Metaclisis floridana*: Muesebeck and Masner, Hymenoptera of America North of Mexico, Synoptic Catalog, Agriculture Monogr. 2 (2nd Suppl.), p. 300.
 1968 *Metaclisis floridana*: Masner and Muesebeck, Bull. U.S. natn. Mus. 270: 79.
 1979 *Metaclisis floridana*: Muesebeck, in Krombein *et al.*, Catalog of Hymenoptera in America north of Mexico, Smith. Inst. Press, p. 1172.

The original description is rather laconic, incomplete, and in some respects incorrect. The redescription is based on the holotype and a perfectly matching female specimen from Maryland (see Material).

Female. Length 2.1 mm. Black; trochanters, knees and tarsi light brown, apex of fore femur and the fore tibia even lighter; fore wing almost clear, with submarginal vein dark brown.

Head transverse (30:61), with dense silvery hairs; occiput rugulose-coriaceous, with occipital carina sharp and complete, with some crenulae medially; vertex rough coriaceous; upper part of frons coriaceous, with scattered punctures, lower median part of frons above antennal insertion with much finer coriaceous sculpture; upper part of cheeks along lower inner orbits heavily fan-like striate; eyes with scattered hairs; eye height, interorbital space, and scape in ratios 30:40:36; OOL as long as ocellar diameter; antenna (Fig. 4) with non-abrupt 4-segmented clava.

Mesosoma slightly wider than high (58:50), with dense silvery pilosity; mesoscutum and scutellum coriaceous-punctate; notauli deeply incised, gradually dilated in posterior half, distinctly crenulate at bottom; mesopleuron along upper margin with wavy striae; fore wings not surpassing the tip of metasoma; basal vein almost inconspicuous; legs short and stout.

Metasoma short, as long as head and mesosoma combined; T1 entirely costate, not humped at junction with T2; T2 with heavy parallel costae reaching medially almost to apex of tergite leaving here a narrow smooth strip not longer than T3; T3-T5 finely coriaceous, with one row of hairs each; T6 almost smooth, wider than long (20:16); ovipositor sheaths shortly extruded.

Male (new description). Differs from female by following characters. Legs generally lighter, with fore legs and antennae yellowish brown; antenna with very short flagellum, A5-A9 distinctly transverse; T2 with striae slightly shorter than in female.

MATERIAL EXAMINED. Holotype ♀ (USNM, No. 2860) "Jacksonville Fla.", "Type", "Collection Ashmead", red tag "Type No. 2860 USNM", "Acerota floridana Ashm.", (the latter label in Ashmead's handwriting); ♀ Patuxent Wildlife Center near Laurel, MD, May 11-16 1979, pan trap, M. Schauff (CNC); ♂ Orient, Long Island, NY, 1946, Roy Latham (USNM); ♂ La Trappe (PQ), April 1946, J. Ouellet (U. Montréal); ♂ Old Chelsea (PQ) May 13 1965, M. Ivanochko (CNC); ♀ Rondeau Provincial Park (Ont.) May 14-30 1973, Malaise trap (CNC); 2 ♀♀ Rondeau Provincial Park (Ont.), May 31 1979, by sweeping, L. Masner (CNC); ♀ Shawnee S.F. near Pine Hill (Ill.), May 2 1979, by sweeping, H. Goulet (CNC); ♂ Montmorency Co. (Mich.), May 29-30 1966, windowpane trap, L.E. Wilson (MSU).

DISTRIBUTION. Infrequently collected but apparently widespread eastern species. Specimens were examined from Florida, Illinois, Michigan, Quebec, and Ontario.

BIOLOGY. The host is unknown but presumed to be some larger species of gall-forming Cecidomyiidae. Adult wasps were collected mostly during the second half of May. There seems to be only one generation per year.

VARIABILITY. Individuals examined varied in body size from 1.5 to 2.5 mm. A short median furrow situated between the notauli in front of scutellum was observed in one female.

REMARKS. The larger individuals of *M. floridana* are the largest among all members of this genus (worldwide). Specimens of *M. floridana* are quite peculiar among those of all Nearctic species because of the sculpture of T2 and distinctly crenulate notauli. Specimens of the Palearctic *M. striatitergitis* Szabó differ from those of *floridana* in structure of antennae, however, in general, they appear very similar to those of this Nearctic species.

10. *Metaclisis borealis* n. sp.

Fig. 5

Female. Length 1.4 mm. Chestnut brown; antennae and legs yellowish brown; wings almost clear, with submarginal vein rather pale.

Head transverse (20:40), with dense silvery hairs; occipital carina complete, with minute crenulae; occiput, vertex, and frons with fine coriaceous sculpture; cheeks with short fan-like striae, not extending to frons; keel between lower orbits and base of mandibles rather fine; eye height, interorbital space, and scape in ratios 17:24:24; eyes with short hairs; OOL 1.5 times as long as ocellar diameter; temples behind eyes less receding than in *M. alticola*; antenna (Fig. 5) with non-abrupt, rather slender 3-segmented clava, with A3 twice as long as wide.

Mesosoma slightly wider than high (38:35), rather flattened dorsally, with rather dense pilosity; mesoscutum and scutellum with coriaceous sculpture; notauli distinctly dilated in posterior $\frac{1}{3}$, not crenulate at bottom; fore wing long, distinctly surpassing tip of metasoma longer than metasoma (127:75); basal vein pale, other veins not indicated.

Metasoma slightly longer than head and mesosoma combined (75:65), not humped at junction of T1 and T2; T1 longitudinally costate; T2 slightly longer than wide (42:37), distinctly longer than T3-T6 combined (42:28), with short costae basally, costae at meson not longer than length of T1, and with longer, finer striae anterolaterally, almost smooth in remaining part but with submicroscopic coriaceous sculpture (to be examined at angle, 160 \times); anterolateral foveae deep, longitudinally striate; T3-T5 with delicate coriaceous sculpture and one row of hairs each; T6 only slightly wider than long (14:12); S6 as long as S3-S5 combined (13:13); ovipositor sheaths not extruded.

Male. Differs from female in having fore wings twice as long as metasoma (115:50), metasoma shorter than head and mesosoma combined (50:60), and in structure of antennae, with A5-A9 moderately elongate (5.5:3.5), A4 only slightly expanded apically, with longitudinal outer carina.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16487), Canada, Hebron (Newfoundland-Labrador), August 10 1954, on *Salix*, J.F. McAlpine (left antenna on slide). Allotype: ♂, with same data as holotype but caught August 9 on dandelion (*Taraxacum*) (CNC). Paratypes: 3 ♀♀, with same data as holotype but caught August 5 and 9 on *Salix* and *Taraxacum* (CNC).

DISTRIBUTION. Newfoundland (Labrador).

BIOLOGY. The host is unknown but is expected to be a cecidomyiid associated with willow (*Salix*).

VARIABILITY. No substantial variability was encountered in the type series.

REMARKS. Specimens of *M. borealis* may be compared with those of *M. alticola* because of the unusually long fore wings. However, they may be distinguished from one another by different structure of metasoma and length of A3 in female sex. The Latin name of this new species refers to its northern distribution.

11. *Metaclisis attenuata* n. sp.

Female. Length 1.7 mm. Black; antennae and legs brown, trochanters, knees and tarsi lighter; wings distinctly infuscate, with submarginal vein brown.

Head transverse (21:36), with rather dense silvery pilosity; occiput with very fine coriaceous sculpture and scattered minute pustulae; occipital carina fine, complete, not crenulate; vertex and frons along inner orbits with fine coriaceous sculpture; middle part of

frons with much finer coriaceous sculpture, almost smooth between anterior ocellus and toruli, with longitudinal striae extending from cheeks; cheeks distinctly fan-like striate; eye height, interorbital space, and scape in ratios 15:22:23; eyes with scattered hairs; OOL almost twice as long as ocellar diameter; temples behind eyes strongly receding; antenna with rather abrupt 3-segmented clava; antennal segments in relative proportions (length:width) 23:4, 8:3, 4.5:2, 4:2, 3:2.5, 3:3, 4:3.5, 6:4.5, 6:4.5, 9:4.5.

Mesosoma slightly wider than high (35:32), in lateral view appreciably flattened dorsally, with rather dense minute hairs; mesoscutum and scutellum with very fine coriaceous sculpture; notauli distinctly dilated in posterior $\frac{2}{3}$, not crenulate at bottom; fore wing reaching to tip of metasoma; basal vein quite distinct, median, postmedian, cubital and radial veins faint.

Metasoma distinctly longer than head and mesosoma combined (110:60), attenuate, distinctly humped at junction of T1 and T2; T1 almost vertical due to development of hump, with only minute costae along anterior margin medially, smooth at meson, with fine longitudinal striation at sides; T2 distinctly elongate (56:33), longer than T3-T6 combined (56:53), with fine striae basally and fine continuation of striae up about the middle of the tergite; T3-T5 with fine coriaceous sculpture, with one row of hairs each; T6 smooth, longer than wide (12:10); S6 triangular, elongate (25:14), shorter than S3-S5 combined (25:33); ovipositor sheaths long, extruded.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (U. California, Davis) USA, La Honda, San Mateo Co. CA, February 8 1959, R. Schuster, ex *Umbellularia californica* (Lauraceae). Paratype: ♀ with same data as holotype (CNC No. 16486).

DISTRIBUTION. California.

BIOLOGY. Unknown.

VARIABILITY. The striae on T2 are shorter and less expressed in the paratype. T3-T6 are slightly shorter in the paratype, may be retracted due to long storage of type material in alcohol.

REMARKS. The female of *M. attenuata* is quite peculiar among those of all Nearctic species of *Metaclisis* in having T2 almost twice as long as wide. Traces of radial and cubital veins (by darker lines) in fore wing are also diagnostic. Surprisingly, S6 is relatively short in combination with strong development of hump between T1 and T2. The name (in Latin) refers to the long, narrow metasoma in this species.

12. *Metaclisis pumilio* n. sp.

Fig. 8

Female. Length 0.9 mm. Dark brown to black; antennae and legs brown, with fore tibiae, knees and tarsi of all legs yellowish brown; wings almost clear, with submarginal vein light brown.

Head only slightly transverse (17:26), almost subrectangular, with rather dense silvery hairs; occipital carina complete, though delicate at meson, with no distinct crenulae; occiput and vertex (interocellar triangle) with delicate coriaceous sculpture; temples and frons almost entirely smooth, shining, with no sculpture below anterior ocellus; cheeks with short and rather delicate fan-like striae; keel between lower orbit and base of mandibles delicate; eye height, interorbital space, and scape in ratios 12:16:15; eyes with rather long hairs; OOL slightly less than ocellar diameter; temples behind eyes at first almost straight and then receding; antenna short (Fig. 8), with rather abrupt 3-segmented clava, with A3 only slightly longer than wide (2.2:2).

Mesosoma only slightly wider than high (26:24), moderately arched dorsally, with rather long suberect silvery hairs; mesoscutum with very fine coriaceous sculpture and scattered setigerous punctures; notauli dilated posteriorly, not crenulate at bottom; scutellum almost smooth, shining, with suberect silvery hairs; fore wings longer than metasoma (80:50), distinctly surpassing tip of metasoma; basal vein indicated, other veins absent; longest marginal cilia about $\frac{1}{8}$ of maximal width of fore wing.

Metasoma rather short, only slightly longer than mesosoma and head combined (50:40), with no hump at junction of T1 and T2; T1 smooth except for extremely short costae along anterior margin; T2 slightly longer than wide (30:28), almost twice as long as T3-T6 combined (30:16), with fine striae anteromedially, striae not longer than T1, smooth in the remaining part, with anterolateral foveae finely striate and pilose; T3-T6 smooth, with one row of hairs each; T6 broadly triangular, wider than long (11:6); S6 shorter than S3-S5 combined (8:13); ovipositor sheaths retracted.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16492), Canada, Rondeau Provincial Park (ON), May 31 1979, by sweeping herbaceous plants, L. Masner. Paratypes: 78 ♀♀, with same data as holotype (CNC, USNM); 9 ♀♀, with same data as holotype but caught by sweeping on June 2 (CNC); 13 ♀♀, Canada, Point Pelee National Park (ON), May 29 1979, by sweeping herbaceous plants, L. Masner (CNC); 2 ♀♀, Canada, Rockport (ON), May 12 1959, J.R. Vockerth (CNC); ♀, Canada, Lac Roddick (PQ), May 20 1979, L. Masner (CNC); 6 ♀♀, USA, Shawnee S.F., Pine Hill (IL), May 2 1979, H. Goulet (CNC); ♀, USA, Patuxent Wildlife center near Laurel (MD), May 16-25 1979, Malaise trap, M. Schauff (CNC); ♀, USA, Highlands (NC), 1200 m, May 16 1957, Berlese sample, W.R. Mason (CNC); ♀, USA, McClellanville (SC), March 1971, E. Munroe (CNC).

DISTRIBUTION. Ontario, Quebec, Illinois, Maryland, North and South Carolinas.

BIOLOGY. Host unknown. *M. pumilio* may be a thelytokous species or facultatively arrhenotokous.

VARIABILITY. The length of body varies from 0.8 mm to 1.2 mm. The larger individuals tend to have striae on T2 better developed, longer than T1, head slightly more transverse and temples more receding than the smaller specimens.

REMARKS. Females of *M. pumilio* are the smallest among Nearctic species of *Metaclisis*. The subrectangular shape of head, with temples partly parallel behind eyes, the smooth frons and scutellum, and the relatively long marginal cilia in fore wing are diagnostic characters. The Latin name of this species refers to small size of its females.

13. *Metaclisis sulcata* n. sp.

Female. Length 1.1 mm. Black; extreme base of scape, trochanters, knees, and tarsi light brown; wings clear, hyaline, with white pubescence, with submarginal vein yellowish brown.

Head transverse (17:33), with rather dense whitish hairs; occipital carina fine though complete, with no crenulae; occiput, vertex, frons, and temples with coriaceous sculpture; cheeks with short fan-like striae; keel between lower orbit and base of mandibles present; eye height, interorbital space, and scape in ratios 15:19:19; eyes with rather long and dense whitish hairs; OOL as long as ocellar diameter; temples behind eyes strongly receding; antenna with rather abrupt 3-segmented clava; antennal segments in relative proportions (length:width) 19:3, 7:3, 3:2.5, 2:2.5, 2:2.5, 2:3, 2.5:3.5, 5:4.5, 5:4.5, 7.5:4.5.

Mesosoma moderately wider than long (33:26), rather flattened dorsally, with dense fine hairs; mesoscutum and scutellum with even coriaceous sculpture; notauli narrow, deeply incised, not dilated posteriorly, about as deep as wide, not crenulate at bottom; fore wings longer than metasoma (80:60), scarcely reaching tip of metasoma; basal vein indistinct, indicated only as a pale streak, other veins not developed; longest marginal cilia about $\frac{1}{11}$ of maximal width of fore wing.

Metasoma elongate, slightly longer than mesosoma and head combined (60:50), with no hump at junction of T1 and T2; T1 with short costae in anterior half, smooth in posterior half; T2 longer than wide (31:28); longer than T3-T6 combined (31:25), with anterior costae only as long as half of T1 and with some finer striae not exceeding the $\frac{1}{4}$ of the tergite, smooth in the remaining part, with anterolateral foveae small, hairy; T3-T6 almost smooth, with one row of hairs each; T6 triangular, wider than long (12:10); S6 shorter than S3-S5 combined (12:17); ovipositor sheaths long extruded, as long as half of hind tibia.

Male. Differs from female in structure of antenna and metasoma. A4 with longitudinal outer carina, segment not particularly expanded distally; A5-A9 almost as long as wide, or slightly transverse, A10 elongate (7:3), more than twice as long as A9 (7:3); T2 anteriorly with costae shorter and finer than in female.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16493), Canada, Spencerville (ON), August 18 1978, L. Masner. Allotype: ♂, with same data as holotype but caught on August 21 (CNC). Paratypes: ♀, Canada, Ottawa (ON), September 5 1974, L. Masner (CNC); ♀, Canada, Ottawa (ON), August 14 1940, O. Peck (CNC); ♀, Canada, Crow Lake near Marmora (ON), August 10 1959, L.K. Smith (CNC); 3 ♀, Canada, Audi Lake, Riding Mt. N.P. (MB), July 10 1979, H. Goulet; ♂, Canada, Kouchibouguac N.P. (NB), August 9 1977, S.J. Miller (CNC); ♀, USA, Belfast (ME), August 25 1972, on *Solidago* sp., M.W. MacGown (CNC); ♀, USA, Harborside (ME), August 14 1937, on evening primrose, L. Blevins, *Metaclisis* sp., det. Muesebeck 1937 (USNM); ♀, USA, Cade's Cove, Great Smokey Mts. N.P. (TN), June 1-6 1979, pan trap, N.F. Johnson and M. Sharkey (CNC).

DISTRIBUTION. From New Brunswick and Maine to Manitoba also in the Appalachians (Tennessee).

BIOLOGY. Host unknown. However, the data involving the goldenrod (*Solidago*) in Maine are supported by more material collected on goldenrod near Ithaca (NY) (O.D. Sholes) by nightsweeping. The latter material is not included in the type series because of poor stage of preservation. *M. sulcata* appears to be the only Nearctic species with flight period in summer and fall.

VARIABILITY. In spite of considerable range of distribution of *M. sulcata* relatively little variation has been encountered among the specimens examined. The costae of T2 may be as long as length of T1 in some specimens.

REMARKS. Specimens of *M. sulcata* are unique among those of all Nearctic species of *Metaclisis* in having narrow, non-dilated notauli in combination with whitish pilosity and a glassy look of the wings. The Latin name of this new species draws the attention to shape of the notauli (sulci).

14. *Metaclisis verna* n. sp.

Fig. 10

Female. Length 1.4 mm. Black; antenna dark brown, legs dark brown except for knees and fore tibiae that are yellowish brown; wings slightly infuscate, submarginal vein in fore wing brown.

Head transverse (22:43), with silvery pilosity; occipital carina complete, with minute crenulae; occiput, vertex and frons with coriaceous sculpture, middle of frons with smoother area and with some longitudinal elements medially right above toruli; cheeks with fan of strong striae, keel between lower orbit and base of mandibles rather weak; eye height, interorbital space, and scape in ratios 16:25:25; eyes with scattered hairs; OOL as long as ocellar diameter; temples behind eyes strongly receding; antenna (Fig. 10) with rather abrupt 4-segmented clava.

Mesosoma as high as wide (41:41), rather arched dorsally, with scattered appressed silvery hairs; mesoscutum and scutellum with fine coriaceous sculpture; notauli gradually dilated in posterior $\frac{1}{3}$ and here distinctly wider than the height of their incision into mesoscutum; fore wings slightly surpassing the tip of metasoma, the fore wing longer than metasoma (105:65); basal vein vestigial, indicated by darker streak only in its upper part; other veins not indicated.

Metasoma short and stout, shorter than mesosoma and head combined (65:75), not humped at junction of T1 and T2; T1 with strong longitudinal costae; T2 slightly wider than long (45:40), distinctly longer than T3-T5 combined (40:17), with strong longitudinal costae in anterior half and delicate coriaceous sculpture in posterior half; anterolateral foveae of T2 very shallow and pubescent; T3-T6 with delicate coriaceous sculpture and one row of silvery

hairs each; T6 broadly triangular, wider than long (16:7); S6 wider than long (16:13), shorter than S3-S5 combined; ovipositor sheaths shortly protruding.

Male. Unknown.

TYPE MATERIAL. Holotype ♀ (CNC No. 16494), Canada, Rondeau Prov. Park (ON), May 31 1979, by sweeping, L. Masner. Paratypes: 2 ♀ ♀, with same data as in holotype (CNC).

DISTRIBUTION. Ontario.

BIOLOGY. Unknown.

VARIABILITY. Little variability has been observed in the short type series. One paratype female is only 1 mm long. However, I have six more females (ON, PQ, NY) tentatively assigned to this species that differ in structure of antennae. The A7 is markedly smaller than A8 thus making the club appear almost 3-segmented. I prefer not to include the above series in the type material.

REMARKS. The female of *M. verna* is short and stocky, with short antennae and short metasoma. It resembles smaller individuals of *M. floridana* but is distinguished from the latter at once by shorter costae on T2 and non-crenulate notauli. It is conveniently distinguished from the females of *M. vernalis* by having relatively short A3. The latin name used refers to the spring season when adults of this vernal species appear for a short period.

15. *Metaclisis alticola* n. sp.

Female. Length 1.05 mm. Dark brown; antennae, legs, and mandibles light brown, fore tibiae and tarsi yellowish brown; fore wing slightly infusate, with submarginal vein brown.

Head transverse (18:35), with dense silvery hairs; occipital carina complete, with no distinct crenulae; occiput, vertex and most of frons finely coriaceous, sculpture finer in middle of frons; cheeks with very delicate, short fan-like striae not reaching to lower frons, with sharp keel running from lower orbit to base of mandibles; eye height, interorbital space, and scape in ratios 16:22:22; eye with short hairs; OOL 1.5 times longer than ocellar diameter; temples behind eyes strongly receding; antenna rather slender, with moderate, non-abrupt 3-segmented clava; antennal segments in relative proportions (length:width) 22:3.5, 7:3, 3:2, 2.9:2, 2.9:2, 2.8:2.5, 3:2.7, 5:3.5, 5:3.5, 8:3.5.

Mesosoma only slightly wider than high (32:30), appreciably arched dorsally, the scutellum in particular; mesoscutum with fine coriaceous sculpture, with dense pilosity; notauli dilated posteriorly, not crenulate at bottom; scutellum coriaceous; fore wings unusually long, surpassing tip of metasoma by about half the length of metasoma; basal vein rather distinct.

Metasoma short, shorter than mesosoma and head combined (45:60), not humped at junction of T1 and T2; T1 partly longitudinally costate; T2 slightly wider than long (35:30), distinctly longer than T3-T6 combined (30:10), with basal striae not longer than length of T1, otherwise smooth, with anterolateral foveae shallow and sparsely hairy; T3-T6 almost smooth, with one row of hairs each; T6 broadly triangular, several times wider than long; S6 distinctly shorter than S3-S5 combined; ovipositor sheaths, extruded, slightly longer than hind basitarsus.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16484), USA, Sierra Blanca Ski Bowl (Lincoln Co.) (NM) 3000 m, June 10-26 1979, Malaise trap, S. & J. Peck.

DISTRIBUTION. New Mexico.

BIOLOGY. Unknown.

REMARKS. The female of *M. alticola* is distinct among those of all Nearctic species because of the unusually long wings in combination with very short metasoma and the slender 3-segmented antennal clava. The length of the wings may be interpreted as a correlation with the high altitude adaptive trends discussed in the introduction. The Latin name suggests the high altitude habitat of this species.

16. *Metaclisis longula* n. sp.

Fig. 7

Female. Length 1.65 mm. Black; antennae and legs brown, with radicle, apex of scape, trochanters, knees, tarsi, and fore tibiae light brown to yellowish brown; wings almost glassy clear, with submarginal vein yellowish brown.

Head transverse (22:42), with short scattered hairs; occipital carina complete, crenulate; occiput and vertex with delicate rugulose-punctate sculpture; frons with coriaceous sculpture and scattered larger punctures; cheeks with short and rather delicate fan-like striae; keel between lower orbit and base of mandibles delicate; eye height, interorbital space, and scape in ratios 18:23:23; eyes with only very short scattered hairs; OOL slightly less than ocellar diameter; temples behind eyes strongly receding; antenna (Fig. 7), with non-abrupt 3-segmented clava, with A3 only slightly elongate (3:2.5).

Mesosoma distinctly wider than high (40:32), considerably flattened dorsally, with rather sparse appressed hairs; mesoscutum with coriaceous sculpture and scattered, rather deep setigerous punctures; notauli distinctly dilated in posterior half, not crenulate at bottom; fore wing as long as metasoma (100:100), reaching only to base of T6; basal vein faintly indicated.

Metasoma distinctly longer than mesosoma and head combined (100:65), with only a delicate hump at junction of T1 and T2; T1 longitudinally costate; T2 longer than wide (48:40), longer than T3-T6 combined (48:44), with striae longer than T1 anteromedially, with anterolateral foveae striate and pilose, virtually smooth in remaining part; T3-T5 and base of T6 with delicate coriaceous microsculpture, most of T6 smooth, tergites with one row of hairs each; T6 as long as wide (20:20), only slightly shorter than T3-T5 combined (20:24); S6 slightly shorter than S3-S5 (22:24); ovipositor sheaths extruded, about as long as hind basitarsus.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16490), USA, Mahomet Hartwood (Champaign Co., IL), May 20-26 1979, Malaise trap in oak forest, S. & J. Peck. Paratypes: 3 ♀ ♀, with same data as holotype (CNC); ♀, USA, Patuxent Wildlife Centre (MD), May 16-25 1979, Malaise trap, M. Schauff (USNM); ♀, Canada, Rondeau Provincial Park (ON), May 31 1979, L. Masner (CNC).

DISTRIBUTION. Illinois, Maryland, Ontario.

BIOLOGY. Unknown. The type series was trapped in an oak forest.

VARIABILITY. Considerable variation seems to exist in total length of metasoma as T2-T6 may be partly retracted (or extruded) hereby changing the wing:metasoma ratio. Similarly, the ovipositor sheaths may be retracted more into the metasomatic cavity in some individuals.

REMARKS. The rather flattened mesonotum, with scattered deep setigerous punctures, seems to be quite diagnostic for females of this species. The Latin name refers to the elongate habitus of females of this species.

17. *Metaclisis annae* n. sp.

Female. Length 1.3 mm. Black; antenna, femora and tibiae dark brown, knees and tarsi light brown; wings slightly infusate, submarginal vein dark brown.

Head transverse (21:40), with very sparse minute hairs; occiput with extremely fine coriaceous sculpture and scattered minute pustulae; occipital carina fine, complete, not crenulate; vertex and frons with very fine coriaceous sculpture, middle of frons with almost smooth surface; genae with only short striae; clypeus not prominent; interorbital space as long as scape (23:23), only slightly longer than eye height (23:19); eyes with scattered short hairs; OOL about 1.5 times longer than ocellar diameter; temples behind eyes strongly receding; antenna with rather abrupt 3-segmented clava; antennal segments in relative proportions (length:width) 22:4, 8:3, 3.5:2, 3:2, 3:3, 2.5:3.5, 3:4, 6:4.7, 6:4.7, 8:4.7.

Mesosoma short and stout, as high as wide (38:38), with only sparse appressed hairs; in lateral view mesosoma rather arched dorsally, the scutellum in particular; mesoscutum and

scutellum finely and evenly coriaceous-punctate; notauli dilated in posterior half, not crenulate at bottom; fore wing reaching to tip of metasoma; basal vein pale.

Metasoma only slightly longer than head and mesosoma combined (75:70), distinctly humped at junction of T1 and T2; T1 with only minute costae along anterior margin, otherwise smooth and glabrous, with tufts of hairs at sides; T2 with minute costae as in T1, otherwise smooth, with no microsculpture (160 \times), glabrous, except for a few scattered hairs at sides; anterolateral foveae on T2 small and not striate; T2 distinctly longer than T3-T6 combined (42:28), longer than wide (42:37); T3-T6 almost smooth, with one row of hairs each; T6 wider than long (17:10); S6 shorter than S3-S5 combined (15:17); ovipositor sheaths shortly protruding.

Male. Unknown.

TYPE MATERIAL. Holotype: ♀ (CNC No. 16485), USA, 24km W. Fort Davis, Texas May 9 1980, sweeping grass and shrubs along Hwy 161, A. Konecny.

DISTRIBUTION. Texas.

BIOLOGY. Unknown.

REMARKS. The female of this species is distinctive in combining a humped base of the metasoma with a relatively short S6. The rather abrupt 3-segmented clava and fine coriaceous sculpture of the head are also diagnostic. The species is named in honour of Miss Ann Konecny who donated a small collection of microhymenoptera to the CNC.

18. *Metaclisis carinata* (Ashmead)

1893 *Monocrita carinata* Ashmead, Bull. U.S. Natn. Mus. 45: 253, 254.

1926 *Monocrita carinata*: Kieffer, Das Tierreich 48: 577.

1951 *Monocrita carinata*: Muesebeck and Walkley, in Muesebeck *et al.*, Hymenoptera of America north of Mexico, Synoptic Catalog, Agriculture Monogr. 2: 707.

1967 *Metaclisis carinata*: Muesebeck and Masner, Hymenoptera of America north of Mexico, Synoptic Catalog, Agriculture Monogr. 2 (2nd Suppl.), p. 300.

1968 *Metaclisis carinata*: Masner and Muesebeck, Bull. U.S. Natn. Mus. 270: 78.

1979 *Metaclisis carinata*: Muesebeck, in Krombein *et al.*, Catalog of Hymenoptera in America north of Mexico, Smithsonian. Inst. Press, p. 1172.

The original description is rather laconic, incomplete, and in some respects incorrect. This redescription is based on the unique holotype.

Male. Length 1.2 mm. The original description states that the body is "black, legs brownish yellow, the femora and tibiae embrowned, the coxae black, tegulae piceous-black, wings subhyaline, the submarginal vein brown ..."; the present colour of the body is light chestnut brown, with legs and antennae yellowish brown, with wings slightly infuscate (the type is some 88 years old).

Head transverse (22:42), with dense silvery pubescence; occipital carina with minute crenulae; occiput with minute pustulae medially, otherwise with fine coriaceous sculpture; vertex and frons along inner orbits with coriaceous sculpture; middle part of frons between toruli and anterior ocellus with much finer sculpture consisting of some longitudinal elements; delicate low keel originates in between toruli, reaching to about mid-frons; cheeks distinctly fan-like striate, with distinct keel connecting lower orbits with base of mandibles; clypeus considerably protruding; eyes with long scattered hairs; eye height, interorbital space, and scape in ratios 20:25:21; OOL as long as ocellar diameter; temples behind eyes strongly receding; antennal segments in relative proportions (length:width) 21:6, 7:4, 3:3, 5.5:5, 4:4.5, 4:5, 4.5:5, 4.5:5.5, 4.5:6, 10:6; A4 with low longitudinal carina.

Mesosoma considerably high, slightly higher than wide (42:39), strongly arched dorsally, the scutellum in particular (in lateral view), with silvery pubescence; mesoscutum and scutellum with very fine coriaceous sculpture; notauli percurrent, fine anteriorly, distinctly

dilated posteriorly, not crenulate at bottom; fore wings almost twice as long as metasoma (100:55), surpassing the tip of metasoma; basal vein well indicated, other veins absent.

Metasoma short, shorter than mesosoma and head combined (50:70); T1 entirely costate longitudinally, with tufts of silvery pilosity at sides; T2 as long as wide (40:40), with strong longitudinal costae in anterior $\frac{1}{3}$, with shallow pubescent anterolateral foveae, the remaining part of the tergite smooth; T3-T7 almost smooth, with one row of hairs each.

Female. Unknown.

MATERIAL EXAMINED. Holotype: ♂ (USNM No. 24554) "Washington D.C. 5.5", "E.A. Schwarz Collector", "Collection Ashmead", red label "Type No. 24554 USNM", "Monocrita carinata Ashm. ♂", the latter in Ashmead's handwriting.

DISTRIBUTION. Washington, D.C.

BIOLOGY. Unknown.

REMARKS. Only the holotype is known. Although sexed correctly by Ashmead as a male (on det. label) it was eventually described as a female. The short scape (shorter than interorbital space) as well as the highly arched mesosoma makes the male of *M. carinata* quite distinct. It could be compared with the male of *M. vernalis*; however, it differs from the latter by the shorter scape. There is a remote possibility that the male of *M. carinata* is an opposite sex to one of the new species described in this paper and based only on the female.

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