MEGOPHTHROMBIUM GRACILE N.SP. AND DIATHROMBIUM DIAPHANE N.G., N.SP. (ACARINA: TROMBIDIIDAE), TWO LARVAL PARASITES OF ADULT SOUTHERN PINE BEETLES 1,2

J. C. Moser3 and P. H. Vercammen-Grandjean4

----- ABSTRACT—One new genus and two new species are described and illustrated. Larvae of both were recovered as parasites of flying adults of Dendroctonus frontalis. -----

Described herein are a new genus and two species of Trombidiidae. Their biology as parasites of the southern pine beetle is discussed elsewhere (Moser, 1979).

One species belongs to Megophthrombium5, a genus recently erected by Mullen and Vercammen-Grandjean (1978), which presently includes the larvae of two species parasitic on mosquito adults from New York and Illinois. Existing keys place the other species near the genera Microtrombidium and Eitmuelleria, but it clearly belongs to neither. The systematic positions of both Megophthrombium and our new genus are vague because most of the other genera of the Microtrombidiinae were based on adult characters; little is known of their larval stages (Vercammen-Grandjean 1973).

For the following descriptions, we suggest the neologisms "stephanostome" and "stolascutum".

Stephanostome: (Plates A and B, Figure 5): (= buccal crown); replaces the term "buccal acetabulum"; this structure is often supported by an intero-basal sclerous and festooned armature (truss-frame).

Stolascutum: scutum with anterolateral flaps recurving ventrally; occurs in the Microtrombidiinae.

Three other terms used, "Iophotrix", "scopa", and "smilum", are usually seen only in the trombiculid literature. They were recently defined by Mullen and Vercammen-Grandjean (1978). Odontus, a term suggested by Newell (1957) is more appropriate and shorter than "palpotibial claw", which is no "claw".

Genus Megophthrombium Mullen and V-G 1978


DIAGNOSIS—MICROTROMBIDIINAE of medium to large size (Ip= 710-970). 'SIF= 7N, T-N-2-2110.0000. F Pp = 0/0/nmN. Body: elongate & pyriform, poorly sclerotized; provided with huge eyes especially the anterior pair of corneas (0 22-44 µ); body setae rather long, thin and barbed. fD= 244662 (2)= 26 [ (2) stands for pygosomalae], fV= 22µ= 4 [u stands for uropore], NDV= 30, inserted on conical disks or plates. 4 larger anterior plates. Scutum: stolascutum type, not pleated fine porosity, with 3 x 2 peripheral setae and 2 scarcely ciliated trichobothria (Tb) or

1. Dendroctonus frontalis Zimmerman 1868 (Coleoptera: Scolytidae).
2. Investigation supported in part by the USDA Southern Pine Beetle Program.
4. 2062 20th Avenue, San Francisco, California 94116.
5. Megophthrombium: contraction for the Greek terms, "mega" (large), "ophthalmos" (eye), and Trombium.
Figs. 1-5. *Megaphytophorum gracile* n. sp.: 1, body (dorsum left, venter right); 2, front leg (dorsal); 3, middle leg (dorsal); 4, hind leg (half profile); 5, stephanostome.

**Legs:** anterotarsus twice as long as tibia, itself twice as long as genu (Ta=2ta=4Ga). Genualae (2.1.1), anterogenuala thrive as long as the bearer genu (ga=3Ga). Pretarsalae PT' and PT'', and subterminala ST present. Coxalae (2.1.1), sternalae (0.2). Posterotarsus expanded, with subterminal scopae, and terminal claw, empodium, *smilum* and remarkably sophisticated *lophotrix.*

*Megophthalmium gracile* n. sp.

(Plate A, Figs. 1-5)

**MATERIAL—** Holotype larva n°18,538, deposited in the U.S. National Museum of Natural History; two paratypes n°s 18,631 and 18,977, deposited in the acarology collection, U.S. Forest Service, Pineville, Louisiana.

**MEASUREMENTS—** of 3 specimens, in microns.

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**DESCRIPTION—** The general sunfamily and generic characters, plus: Scutum (Plate A, Fig.1): *stolascutum* poorly sclerotized with variable porosity, sparse; with two lateral crescent-shaped cuts and barely striated flaps; bearing 2 nude AL, 2 ML and PL barbed, and 2 nude and slender Tb; PL>ML>AL. *Eyes:* huge, plates (61 x 34μ), corneas (0.32 and 25μ). *Scutellum:* poorly sclerotized and sparsely punctate (variable porosity), wider than scutum, with 2 barbed Dc (27μ). *Body setae:* 2 anterocentral larger plates (34 x 30μ) with the longest seta (60μ) inserted on a conical center. 2 anterolateral large plates (27 x 18μ), 2 pygosomala (107μ) on large cones (0.17μ), the other dorsals on smaller cones (0.11-7μ), ventrals (0.7μ), sternals (0.9μ). *Uropore:* lenticular (16 x 7μ). *Gnathosome:* palptarsal pilous formula, fT= TN. T: 4 short spines (2-3μ), 1 terminala (T=5μ), and 3 slender, nude setae (6.30,43μ), plus the non-formulated and rather long, basal solenidion (Sb=27μ). Palpobita bearing 2 short and 1 long setae (4.5.37μ), and the apical small and recurved, bifid odontus (7μ). No genualae, femoralea or supracoxalae. *Stephanostome*: (0.26μ, L=7μ), festooned collarette (Fig. 5) without truss-frame. *Chelicera:* strongly curved chelostyle (13μ); chelobase (54μ), width: top (7μ), bottom (17μ). *Galea:* (32μ), protorostrala (7μ), deutorostrala (1.5μ), tritorostrala (5μ) brush-like. *Front leg* (Plate A, Fig. 2): the shortest tarsus (7μ), twice as long as the corresponding tibia, bearing a long, recurved and acuminate S1 (45μ) and its f1 (3μ), a ST (29μ), a PT' (13μ), and terminally 2 claws (trifurcate apex), plus a simple empodium; tibia (34μ), with 2 tubialae (36 and 55μ) and an apicodorsal microtibia (4μ); genu (18μ), with 2 genualae (54 and 53μ) and an apicodorsal microgenuala (4μ); femur (39μ), with an apicodorsal thin and nude seta (16μ); trochanter (37μ); coxa (53μ), with 2 bifid setae. *Middle leg* (Plate A, Fig. 3): the shortest tarsus (55μ), bearing a Sg (16μ) and its f1 (2.6μ) near a stachus (26μ), a PT" (13μ), and terminally 2 claws (trifurcate apex) plus a simple empodium; tibia (30μ), with 2 tubialae (16 and 18μ); genu (18μ), with one genuala (44μ) and an apicodorsal microgenuala (4μ); femur (36μ), with an apicodorsal thin and nude seta (16μ); trochanter (35μ); coxa (48μ), with 1 bifid seta. *Hind leg* (Plate A, Fig. 4): expanded and noticeably modified tarsus (47μ), bearing 1 inner scopa (16μ), 1 outer claw (33μ, with trifurcate apex and tenant barba), 1 empodium (35μ, with tenant ciliae), 1 smilum (13 x 5μ, bifid; encased portion 18μ), and 1 very elaborated *lophotrix* (50μ) (Plate A, Fig. 4); tibia (26μ) distally expanded; genu
Diathrombium diaphane

Figs. 1-5: *Diathrombium diaphane* n.g., n.sp. - 1. body (dorsum left, venter right); 2. front leg (dorsal); 3. middle leg (dorsal); 4. hind leg (half profile); 5. stephanostome.
(18μ), with 1 nude genuala (30μ); femur (52μ), with an apicodorsal thin, but ciliated seta (16μ), in addition each femur possesses a basoventral unibranched long, thin seta (33μ); trochanter (44μ); coxa (47μ) with 1 bifid seta. Urstigma prominent, between antero- and mid coxa (0 18μ).

**TYPE DATA**—Holotype larva on head of adult southern pine beetle, *Dendroctonus frontalis*; Rapides Parish, Louisiana, U.S.A.; 3 July 1975; collected by J. C. Moser.

**Genus Diathrombiurn nov.**

**DIAGNOSIS**—MICROTROMBIDIINAE of small size (Ip=669-705). SIF=7N. T-N-2-2110.0000. fPp=n/n/nNN. *Body*; elongate ovoid, poorly sclerotized; setae on disks, or plates, of which 2 anteromediands and 2 anterolaterals are much larger, fD=244662 (2)=26. fV=22 u=4, NDV=30. Scutum: *stolasmtum* type, sparsely punctate and sclerotized, with 3 x 2 peripheral setae and 2 whip-like trichobothria (2 Tb) or sensillae (S). *Eyes*; sessile, narrow plates, 2 x 2 cornes very refringent. Scutellum: almost half as long as scutum, but wider than it, sparsely punctate, with 2 barbed setae. *Stephanostome*: with a festooned collarette (Plate B, Fig. 5), no truss-frame. *Tylorostrala*: chiroid. *Odontus*: bifid, slim and recurved. *Legs*; Coxal and sternal pilous formulae, fCx=2.1.1 and fSt=0.2. Genualae (2.1.1). Pretarsalae. PT' and PT" present; as well as the subterminala ST. Posterotarsus moderately expanded, with subterminal *scopa* and terminally a normal outer claw and empodium, plus *smilum* and *lophotrix*.

**Diathrombiurn diaphane** n. sp. (Plate B, Figs. 1-5)

**MATERIAL**—Holotype larva n° 17,264, deposited in the U.S. Museum of Natural History; two paratypes n° 17,918 and 18,265, deposited in the acarology collection, U.S. Forest Service, Pineville, Louisiana.

**MEASUREMENTS**—of 3 specimens, in microns.

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**DESCRIPTION**—The general subfamily and generic characters, plus: Scutum (Plate B, Fig. 1): *stolasmtum* poorly sclerotized and sparsely punctate, flaps small and barely striate; bearing 2 nude AL, 2 sparsely barbed ML, 2 barbed PL, and 2 nude Tb; PL>AL>ML. Eyes: narrow plates (20 x 15μ), cornes (0 13 and 12μ). Scutellum: poorly sclerotized and sparsely punctate, wider than scutum, with 2 barbed Dc (45μ). Body setae: 4 anterior larger oval plates: 2 centrals (27 x 20μ) and 2 laterals (20 x 12μ); other dorsal conical disks (0 13-μ), ventrals (0 7μ), sternals (0 5μ). Uropore: lenticular (16 x 5μ). Gnathosme: palpotarsal pilous formula, fT=7N. T: 4 short spines (2-3μ), 1 terminala (5μ), and 3 thin setae (7.12 and 42μ), plus the non-formulated basal solenidion (S0= 5-5μ). Palpotibia bearing the apical bifid and recurved odontus (6μ); one dorsal, subapical, spiniform seta (5μ), a lateral thin seta (10μ) and a ventral very long and thin, nude seta (27μ). Stephanostome: (0 22μ, L=5μ) festooned collarette (Plate B, Fig. 5), no truss-frame. Chelicera: chelostyle strongly curved (12μ); chelobase (52μ), width: top (6μ),
bottom (17μ). *Galea*: (32μ), protorostrala (7μ), deutorostrala (2μ), tritorostrala (8μ), chroid (4 thin digits). *Supracoxalae* (?), indistinguishable. **Front leg** (Plate B, Fig. 2): longest tarsus (66μ), bearing a long pointed *S*¹ (33μ); *f*₁ (4μ), *ST* (29μ), *PT'* (14μ), terminally 2 claws (trifurcate apex) and empodium simple; tibia (34μ) with 2 tibialae (21 and 39μ) and an apicodorsal microtibiala (4μ); genu (19μ), with 2 genualae (34 and 40μ) and an apicodorsal microgenual (4μ); femur (38μ); trochanter (37μ); coxa (52μ) with 2 branched setae. **Middle leg** (Plate B, Fig. 3): tarsus (52μ), bearing a *S*₂ (18μ) with its *f*₂ (3.5μ) and nearby *stachus* (25μ), *PT''* (14μ), and terminally 2 claws (trifurcate apex), plus a simple empodium; tibia (31μ), with 2 tibialae (16 and 27μ); genu (17μ), with one genuala (41μ) and an apicodorsal microgenual (4μ); femur (37μ); trochanter (35μ); coxa (44μ), with one branched seta. **Hind leg** (Figs. 1, 4): tarsus (52μ), bearing a subterminal *scopa* (10μ), and terminally 1 normal outer claw (24μ) and empodium (26μ), 1 *smilum* (8μ), and 1 *lophotrix* (22μ, 5 branches); tibia (34μ); genu (18μ), with one genuala (34μ); femur (40μ); trochanter (38μ); coxa (46μ) with a single branched seta. *Urstigma* prominent, between antero-and mid-coxa (0.12μ).

**TYPE DATA**—Holotype larva, on head of adult southern pine beetle, *Dendroctomus frontalis*; Rapides Parish, Louisiana, U.S.A.; 8 May 1975; collected by J. C. Moser.

**LITERATURE CITED**


