

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

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----- 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 *Megophthrombium*⁵, 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 *Ettmuelleria*, 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.

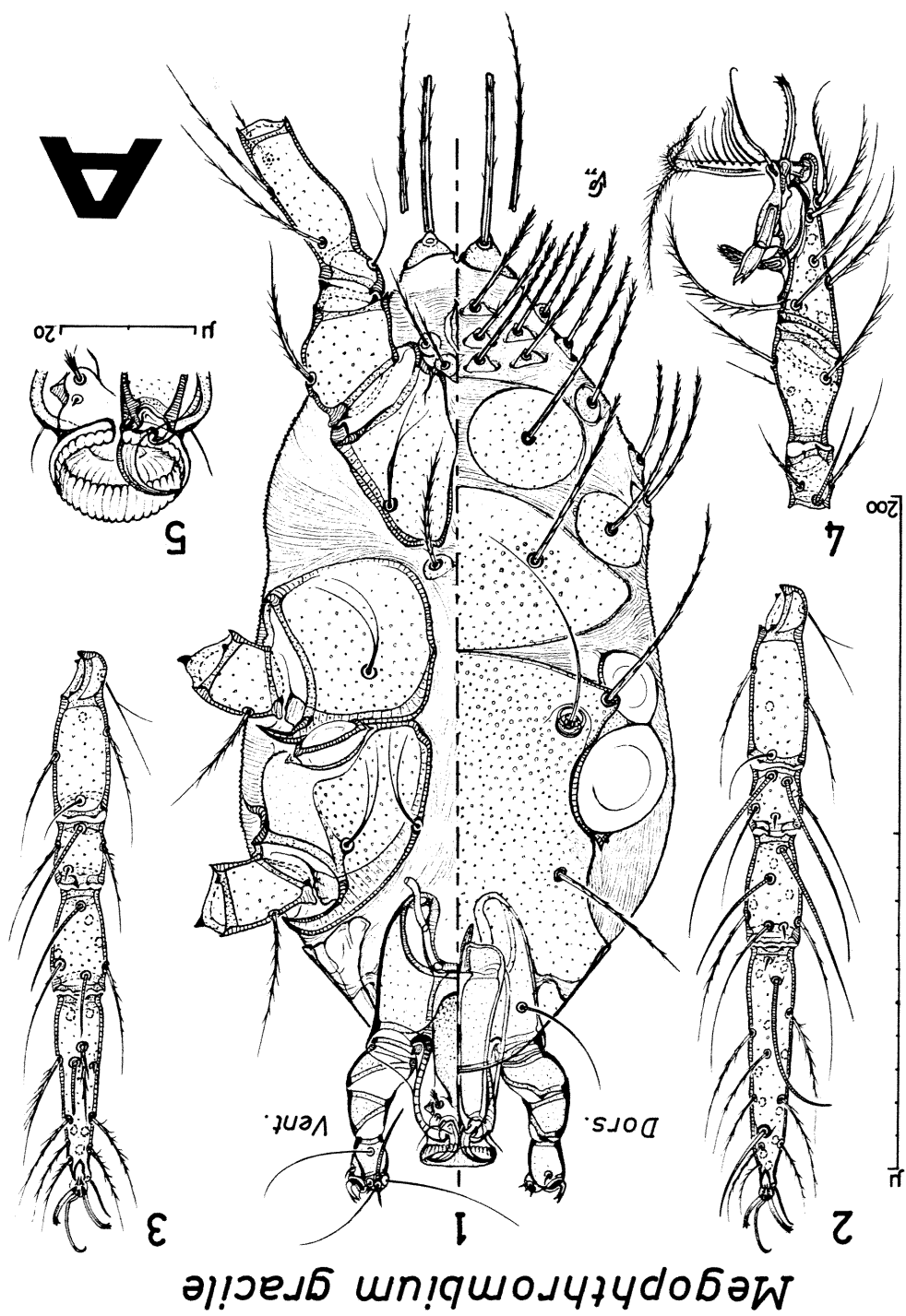
Three other terms used, "*lophotrix*", "*scopa*", and "*smilum*", are usually seen only in the trombiculid literature. They were recently defined by Mullen and Vercammen-Grandjean (1978). *Odontus*, a term suggested by Newell (1957) is more appropriate and shorter than "palpotibial claw", which is no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

Genus *Megophthrombium* Mullen and V-G 1978

TYPE SPECIES—*Megophthrombium welleslyi* Mullen and V-G, 1978.

DIAGNOSIS—MICROTROMBIDIINAE of medium to large size (Ip= 710-970). 'SIF= 7N. T-N-2-2110.0000. FP_p= 0/0/nnN. Body: elongate & pyriform, poorly sclerotized; provided with huge eyes especially the anterior pair of corneas (Ø 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).
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5. *Megophthrombium*: contraction for the Greek terms, "mega" (large), "ophthalmos" (eye), and *Thrombium*.



Figs. 1-5: *Megophthirium gracile* n. sp. - 1, body (dorsum left, venter right); 2, front leg (dorsal); 3, middle leg (dorsal); 4, hind leg (half profile); 5, stephano-stome.

sensillae (S). *Stephanostome*: festooned collarete, no truss-frame. *Tritorostrale*: brush-like. *Legs*: anterotarsus twice as long as tibia, itself twice as long as genu ($Ta=2ta=4Ga$). *Genuale* (2.1.1), anterogenuala thrice 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 *scopa*, and terminal claw, empodium, *smilum* and remarkably sophisticated *lophtrix*.

Megophthrombium gracile n. sp.
(Plate A, Figs. 1-5)

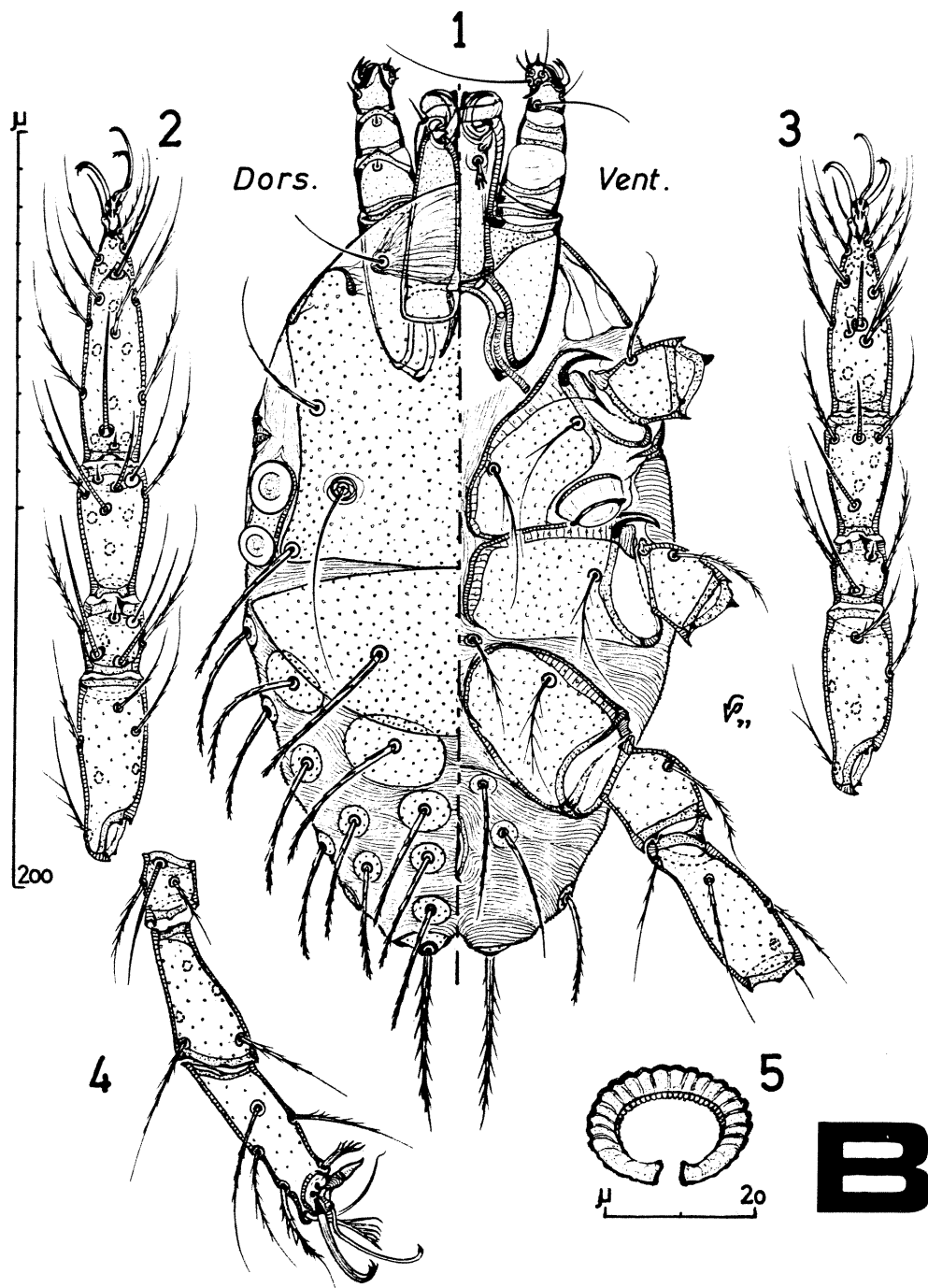
MATERIAL—Holotype larva n° 18,538, deposited in the U. S. National Museum of Natural History; two paratypes n°'s 18,631 and 18,977, deposited in the acarology collection, U. S. Forest Service, Pineville, Louisiana.

MEASUREMENTS— of 3 specimens, in microns.

-----SCUTUM-----															--BODY SETAE-----				
AW	MW	PW	SB	ASB	PSB	SD	A/A	A/M	M/P	S/P	AL	ML	PL	S	--D--	P	--V--		
HT: 38	60	90	66	105	21	126	21	42	55	13	36	44	62	59	60	27	110	20	22
PT1: 36	61	93	67	102	21	123	17	42	54	13	37	45	59	62	60	30	108	19	23
PT2: 41	60	86	64	103	22	125	20	40	53	12	35	46	60	59	60	29	103	21	24
----SCUTELLUM-----															-LEG LENGTHS--				
						sL	sW	Dc	DB	AS	pa	pm	pp	Ip	LST:	pa	pm	pp	
HT:						48	99	58	47	26	253	224	247	724	T	19	14	13	
PT ₁ :						48	104	54	42	27	252	223	242	717	t	6	5	5	
PT ₂ :						48	96	57	46	27	251	219	241	711	G	4	2	2	
															F	6	5	4	

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 ($61 \times 34\mu$), corneas ($\emptyset 32$ and 25μ). *Scutellum*: poorly sclerotized and sparsely punctate (variable porosity), wider than scutum, with 2 barbed Dc (57μ). *Body setae*: 2 anterocentral larger plates ($34 \times 30\mu$) with the longest seta (60μ) inserted on a conical center, 2 anterolateral large plates ($27 \times 18\mu$), 2 pygosomala (107μ) on large cones ($\emptyset 17\mu$), the other dorsals on smaller cones ($\emptyset 11-7\mu$), ventrals ($\emptyset 7\mu$), sternals ($\emptyset 9\mu$). *Uropore*: lenticular ($16 \times 7\mu$). *Gnathosome*: palpotarsal pilous formula, $fT = 7N$. T: 4 short spines ($2-3\mu$), 1 terminala ($T=5\mu$), and 3 slender, nude setae ($6, 30, 43\mu$), plus the non-formulated and rather long, basal solenidion ($S_0=27\mu$). Palpotibia bearing 2 short and 1 long setae ($4, 5, 37\mu$), and the apical small and recurved, bifid *odontus* (7μ). No *genuale*, *femorale* or *supracoxalae*. *Stephanostome*: ($\emptyset 26\mu$, $L=7\mu$), festooned collarete (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 longest tarsus (71μ), twice as long as the corresponding tibia, bearing a long, recurved and acuminate S_1 (45μ) and its f_1 (3μ), a ST (29μ), a PT' (13μ), and terminally 2 claws (trifurcate apex), plus a simple empodium; tibia (34μ), with 2 tibialae (36 and 55μ) and an apicodorsal microtibiala (4μ); genu (18μ), with 2 *genuale* (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 S_2 (16μ) and its f_2 (2.6μ) near a *stachus* (26μ), a PT'' (13μ), and terminally 2 claws (trifurcate apex) plus a simple empodium; tibia (30μ), with 2 tibialae (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 barbs), 1 empodium (35μ , with tenant ciliae), 1 *smilum* ($13 \times 5\mu$, 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.

(18 μ), with 1 nude genuala (30 μ); femur (52 μ), with an apicodorsal thin, but ciliated seta (16 μ), in addition each femur possesses a basoventral *unibranched* long, thin seta (33 μ); trochanter (44 μ); coxa (47 μ) with 1 bifid seta. *Urstigma* prominent, between antero- and mid coxa ($\emptyset$ 18 μ).

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 *Diathrombium* nov.

TYPE SPECIES—*Diathrombium diaphane* n. sp.

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 anteromedians and 2 anterolaterals are much larger, fD=244662 (2)=26, fV=22 u=4, NDV=30. *Scutum*: *stolascutum* 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 corneas very refringent. *Scutellum*: almost half as long as scutum, but wider than it, sparsely punctate, with 2 barbed setae. *Stephanostome*: with a festooned collarete (Plate B, Fig. 5), no truss-frame. *Tritorostrala*: 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*.

Diathrombium 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.

-----SCUTUM-----																BODY SETAE-----			
	AW	MW	PW	SB	ASB	PSB	SD	A/A	A/M	M/P	S/P	AL	ML	PL	S	--D--	P	--V--	
HT:	40	77	90	62	82	22	104	22	42	40	22	27	48	45	52	39	30	47 36 35	
PT ₁ :	41	72	86	61	76	22	98	18	40	39	21	25	42	41	55	38	30	47 35 33	
PT ₂ :	42	76	88	59	78	22	100	19	41	36	19	25	41	?	?	40	29	48 37 34	

-----SCUTELLUM--						-LEG LENGTHS-				LST:			
	sL	sW	Dc	DB	AS	pa	pm	pp	Ip	T	18	14	13
HT:	46	115	48	44	23	252	220	233	705	t	6	5	5
PT ₁ :	43	111	42	40	23	236	211	222	669	G	4	2	2
PT ₂ :	44	108	44	43	24	250	215	231	696	F	6	5	4

DESCRIPTION—The general subfamily and generic characters, plus: *Scutum* (Plate B, Fig. 1): *stolascutum* 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 (29 x 15 μ), corneas ($\emptyset$ 13 and 12 μ). *Scutellum*: poorly sclerotized and sparsely punctate, wider than scutum, with 2 barbed Dc (45 μ). *Body setae*: 4 anterior larger oval plates: 2 centrals (27 x 20 μ) and 2 laterals (20 x 12 μ); other dorsal conical disks ($\emptyset$ 13-7 μ), ventrals ($\emptyset$ 7 μ), sternals ($\emptyset$ 5 μ). *Uropore*: lenticular (16 x 5 μ). *Gnathosome*: palpotarsal pilous formula, fT=7N. T: 4 short spines (2-3 μ), 1 terminala (5 μ), and 3 thin setae (7, 12 and 42 μ), plus the non-formulated basal solenidion (S₀=5.5 μ). Palpotibia bearing the apical bifid and recurved *odontus* (6 μ); one dorsal, subapical, spiniform seta (5 μ), a lateral thin seta (10 μ) and a ventral very long and thin, nude seta (27 μ). *Stephanostome*: ($\emptyset$ 22 μ , L=5 μ) festooned collarete (Plate B, Fig. 5), no truss-frame. *Chelicera*: chelostyle strongly curved (12 μ); chelobase (52 μ), width: top (6 μ),

bottom (17μ). *Galea*: (32μ), protorostrala (7μ), deutorostrala (2μ), tritorostrala (8μ), chiroid (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 microgenuala (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 microgenuala (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 ($\emptyset 12\mu$).

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

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