A NEW SPECIES OF *TRACHYMOLGUS* (PROSTIGMATA: BDELLIDAE) FROM MEXICO

BY Blanca E. MEJIA-RECAMIER * and José G. PALACIOS-VARGAS *

BDELLIDAE
TRACHYMOLGUS
TAXONOMY
TROPICAL FOREST

SUMMARY: *Trachymolgus jesusi* sp. nov. is described and illustrated. This species was collected from soil and leaf litter of a tropical dry forest in western Mexico.

BDELLIDAE
TRACHYMOLGUS
TAXONOMIE
FORÊT TROPICALE

RÉSUMÉ : *Trachymolgus jesusi* sp. nov. est décrite et dessinée. Cette espèce provient de la litière et du sol d'une forêt tropicale sèche du Mexique occidental.

INTRODUCTION

Bdellids are active predators of small arthropods and their eggs. They live in soil, detritus, mosses, lichens and similar microhabitats. We have discovered a new species of the rare genus of *Trachymolgus* Berlese, from western Mexico. In the Old World, the previously named species are *T. nigerrimus* (Canestrini & Fanzago), collected from Italy and Switzerland (THOR, 1931), and *Trachymolgus recki* Gomelauri, 1961 from Russia. In the New World, a species of *Trachymolgus* was mentioned as having been collected in the St. Lawrence Islands National Park, Canada (SMITH, LINDQUIST & BEHAN-PELLETIER, 1996); this record is based on one female (LINDQUIST, pers. com.).

The two known species, *T. nigerrimus* and *T. jesusi* sp. nov., are unique among the Bdellidae in that the adults have heavily sclerotized idiosomal shields rather than soft, striated integument.

Trachymolgus is assigned to the bdellid subfamily Cytinae, which contains only one other genus, *Cyta* von Heyden. Characters common to both taxa include: two pairs of hypostomal setae more anteriorly positioned than in Spinibdellinae; distal cheliceral seta inserted at base of fixed digit; and trichobothria on tibiae I and IV and tarsus III of the legs. Characters separating *Trachymolgus* from *Cyta* include the more strongly sclerotized body and absence of the median eye between the anterior sensilla.

In the descriptive section, mean measurements (in micrometers) are given, followed by the range in parentheses, except for the dorsal idiosomal setae. Grandjean's modified dorsal setal designations are adopted for *Trachymolgus jesusi* sp. nov., and for the legs the terminology follows ATYEO (1960).

Trachymolgus jesusi sp. nov.
(Figs. 1–3)

Diagnosis: *Trachymolgus jesusi* sp. nov. is unique among Bdellidae in having all setae barbulate. This

* Laboratorio de Ecología y Sistemática de Microartrópodos, Departamento de Biología, Fac. de Ciencias, Universidad Nacional Autónoma de México, 04510 México, D. F., Mexico.

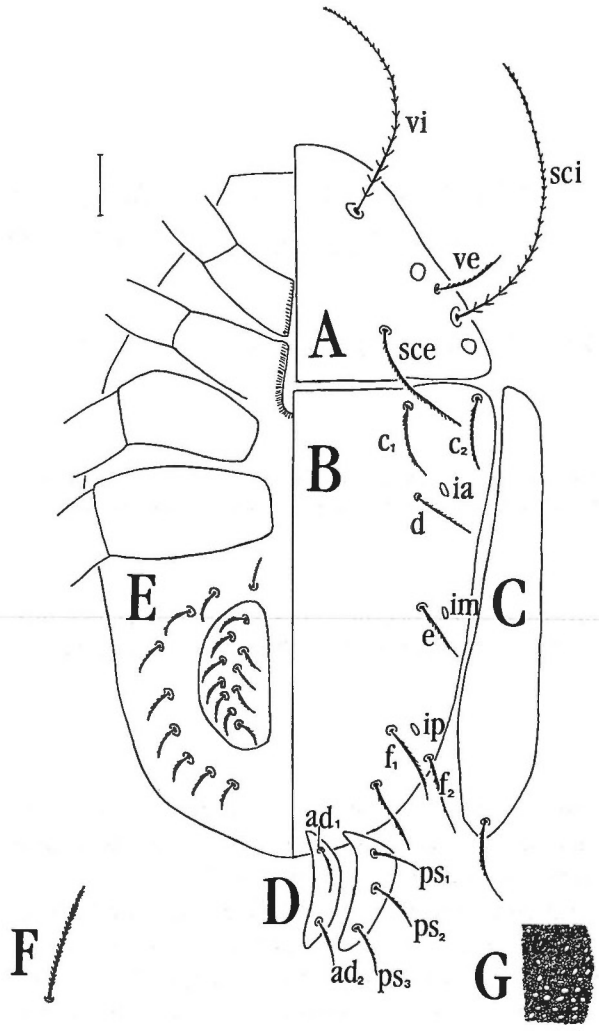


FIG. 1.— *Trachymolgus jesusi* sp. nov., female holotype.
A. — Prodorsal shield. B. — Dorsal hysterosomal shields. C. —Dorsolateral hysterosomal shield. D. —Anal shields (internal and external shield). E. — Venter. F. — Barbulate seta; G. — Granulate and foveolate integument. Scale bar represents 50 μm.

species has platytracheae and a thickened, shield-like integument which is granulate and foveolate.

T. jesusi sp. nov. differs from *T. nigerrimus* and *T. recki* by having 3 teeth on the movable digit of chelicerae, and 2–3 teeth on the fixed digit. The pedipalp shows a complete fusion of the basifemur and telofemur, which clearly separates it from *T. nigerrimus*. Based on the description and drawings of THOR (1931), the new species is longer (999–1,030) than either *T. nigerrimus* (500–700) or *T. recki* (860–924) (GOMELAURI, 1961). *T. jesusi* has the whole body dark purple and armored with two types of cuticular ornamentation, granulate and foveolate (EVANS, 1992). The genital plates each have 10 subequal setae.

Description of female (N = 11): Color dark purple. Idiosoma robust; length, including gnathosoma, 1,034, cuticle granulate and foveolate (Fig. 1G); hypostosome 249 (238–273), ventrally with two smooth adoral setae and two ventral setae, distal seta 17 (16–18), proximal barbulate setae 75 (74–77) (Fig. 2A). Hypostome dorsally with one pair of setae at base of pedipalps 30 (27–33); length of pedipalps 223 (220–226), trochanter 12 (11–14), without setae; fused basi-telofemur 149 (143–150), with ten setae; genu 16 (13–17), with 4 setae; tibiotarsus 46 (36–47), with 4 short setae; dorsal terminal setae (*des*) 181 (179–183), ventral setae (*ves*) 164 (153–172) and one small solenidion (ω) (Fig. 2B). Cheliceral surface granulate and foveolate, 203 (197–213); fixed digit 25 (23–26), with 2 teeth; movable digit 20 (19–22), with 3 teeth; proximal seta 76 (74–77), distal seta 31 (29–38) from base of fixed digit. Both setae smooth and thick (Fig. 2C). Idiosoma covered by strongly sclerotized shields, granulated and foveolate, and all setae barbulate (Fig. 1F). Dorsal propodosomal shield length 180 (170–197), with four eyes; anterior propodosomal sensillum (*vi*) plumose, 123 (121–125) in length; posterior propodosomal sensillum (*sci*) plumose, 147 (136–162); median propodosomal seta (*sce*) 80 (70–98); lateral propodosomal seta (*ve*) 42 (35–54) (Fig. 1A). Dorsal hysterosomal shield 375 (355–394) in length, with three lyrifissures (*ia*, *im*, *ip*); length of internal humeral (c_1) 35; external humeral (c_2) 30; internal dorsal (*d*) 32; internal lumbal (*e*) 32; internal sacral (f_1) 40; external sacral (f_2) 40; and internal clunal (h_1) 36 (Fig. 1B). Lateral hysterosomal shield 363 (336–394), with one seta (h_2), 42 in length (Fig. 1C). Anal region with two pairs of granulate and foveolate shields; internal anal shield 69 (68–73), with two anal setae (ad_1, ad_2), both setae about 27; external anal shield 72 (70–73), with three paranal setae (ps_1, ps_2, ps_3) 35 in length. All setae barbulate (Fig. 1D). Genital region: each genital plate 95 (87–100) long, with 10 subequal genital setae about 21 long; eight pairs of paragenital setae; one unpaired median seta between coxae IV (Fig. 1E); ovipositor

with 20 barbulate setae. (Fig. 2F). Legs (Fig 3): measurements of segments given in table 1, and chaetotaxy in table 2.

Leg	Tr		Fe		G		Tb		Ta	
	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂
I	28	27	111	108	30	27	49	36	91	76
II	49	30	123	99	25	22	49	31	114	73
III	27	25	131	123	30	25	44	55	112	89
IV	38	35	148	135	37	30	77	72	112	92

TABLE 1: Average lengths (in µm) of segments of legs I–IV in 11 females and 10 males of *Trachymolgus jesusi* sp. nov. Abbreviations: Tr = Trochanter; Fe = femur; G = genu; Tb = tibia; Ta = tarsus.

Description of male (N = 10): Color dark purple. Length, including gnathosoma, 999; cuticle granulate and foveolate; hypostosome 247 (222–280), ventrally with two adoral setae, distal seta 17 (15–18); both setae smooth and proximal barbulate, 75 (73–78). Hypostome dorsally with one pair of barbulate setae at the bases of pedipalps, 30 (27–32); length of pedipalps 207 (206–211), trochanter 11 (10–13) with no setae; fused basifemur-telofemur 141 (139–143), with ten setae; genu 13 (10–15), with four setae; tibiotarsus 42 (38–42), with four short setae and one small solenidion (ω), dorsal setae (*des*) 181 (178–185); ventral setae (*ves*), 161 (153–168). Cheliceral surface granulated and foveolate, 200 (197–204); fixed digit 21 (19–22), with 2 teeth; movable digit 20 (19–22), with 3 teeth; proximal seta 69 (65–74), distal seta 26 (22–29) from base of fixed digit. Both setae smooth and thick. Dorsal propodosoma shield 169 (163–175), with four eyes; anterior sensillum (*vi*) plumose, 120 (115–123) in length; posterior sensillum (*sci*) plumose 145 (136–158); median propodosomal seta (*sce*) 80 (70–98); lateral propodosomal seta (*ve*) 44 (35–54). Dorsal hysterosomal shield 368 (345–394) in length; with three lyrifissures (*ia*, *im*, *ip*); length of internal humeral (c_1) 35, external humeral (c_2) 30, internal dorsal (*d*) 35, internal lumbal (*e*) 35, internal sacral (f_1) 45, external sacral (f_2) 45 and internal clunal (h_1) 35. Lateral hysterosomal shield 355 (345–364), with one seta (h_2) 35. Anal region with 2 pairs of granulate and foveolate shields; internal anal shield 62 (58–63), with 2 setae (ad_1, ad_2), both about 25; external anal shield 70 (69–72), with 3 paranal setae (ps_1, ps_2, ps_3), 30 in length. All setae barbulate. Genital region: genital plates 93 (84–98) long, each with 10 subequal setae, about 21 long; eight pairs of paragenital setae; one unpaired median seta between coxae IV; amphioid sclerite (Fig. 2D) with 9 barbulate setae. Legs: as in female (Tables 1–2, Fig. 3A–D).

Description of immatures: Length (including gnathosoma) of three protonymphs 185 (180–205); two deutonymphs 703 (701–706); one tritonymph 798. Color purple.

The developmental stages can be recognized because protonymphs and deutonymphs are not sclerotized, lack eyes and have the dorsal propodosoma and metapodosoma smooth. The protonymphs lack the genital region and platytracheae, and have only 4 pairs of paragenital setae, whereas the deutonymphs have the genital tracheae (Fig. 2E), 6 paragenital setae and 3 genital discs. Tritonymphs are distinguished from the other developmental stages in having an armored body, as in adult (granulate and foveolate), with 2 pairs of eyes on dorsum, arranged laterally. The genital region is well defined and has 5 pairs of setae and 7 pairs of paragenital setae. The ontogenetic chaetotaxy of the legs and palpi is given in table 3.

Material: Holotype female, 10 male and 11 female paratypes, mounted on slides, and 10 paratypes in alcohol, collected by A. RODRÍGUEZ and J. A. GÓMEZ from Jalisco, Chamela MEXICO: 1 male, 4 females, 16 Nov. 1991, from soil; 1 male, 13 Oct. 1991, from litter; 2 males, 1 female, 2 protonymphs, 12 Dec. 1991, from soil; 2 males, 2 females, 12 Jan. 1992, from soil; 1 male, 16 Feb. 1992, from soil; 2 males, 2 females, 14 March 1992, from soil; 1 female, 13 June 1992, from litter; 1 protonymph, 16 May 1992, from soil; 1 deutonymph, 13 June 1992, from soil; 1 tritonymph, 13 June 1992, from soil; 1 male, 2 Dec. 1992, from soil, Mpio. de la Huerta, San Mateo. The holotype and most paratypes are deposited in the institution of the authors; two paratypes are deposited in the following institutions: Museum of Natural History, University of Georgia (Athens, Georgia); the Berlese Collection (Firenze, Italy); and the Canadian National Collection (Ottawa, Ontario).

Etymology: This species is dedicated to the brother of the senior author, Arch. Jesús MEJÍA-RECAMIER.

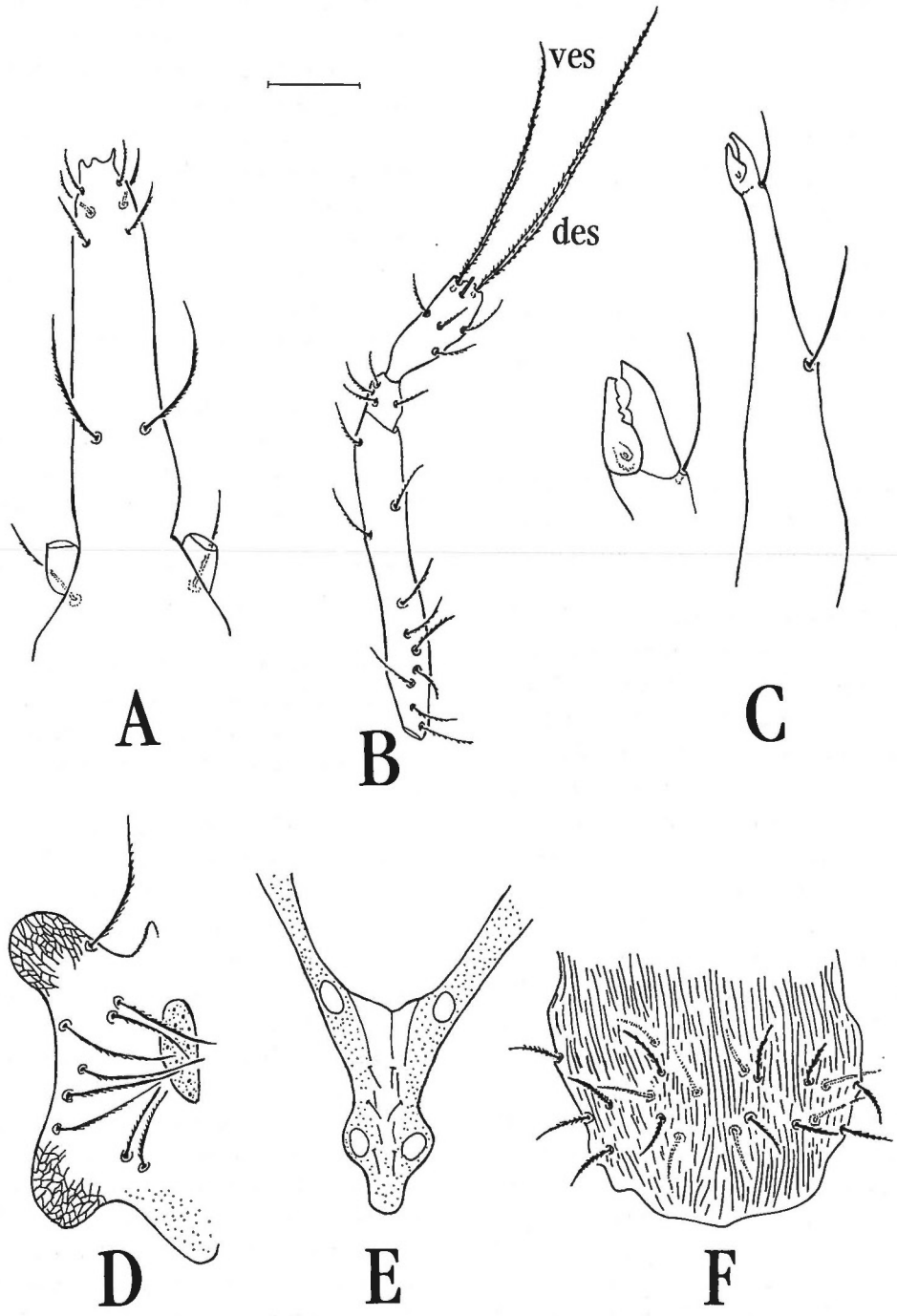


FIG. 2. *Trachymolgus jesusi* sp. nov., female holotype (unless otherwise noted).
A. — Ventral hypostomal setae. B. — Palp. C. — Chelicera. D. — Male amphioid sclerite. E — Genital tracheae. F — Ovipositor. Scale bar represents 50 μm.

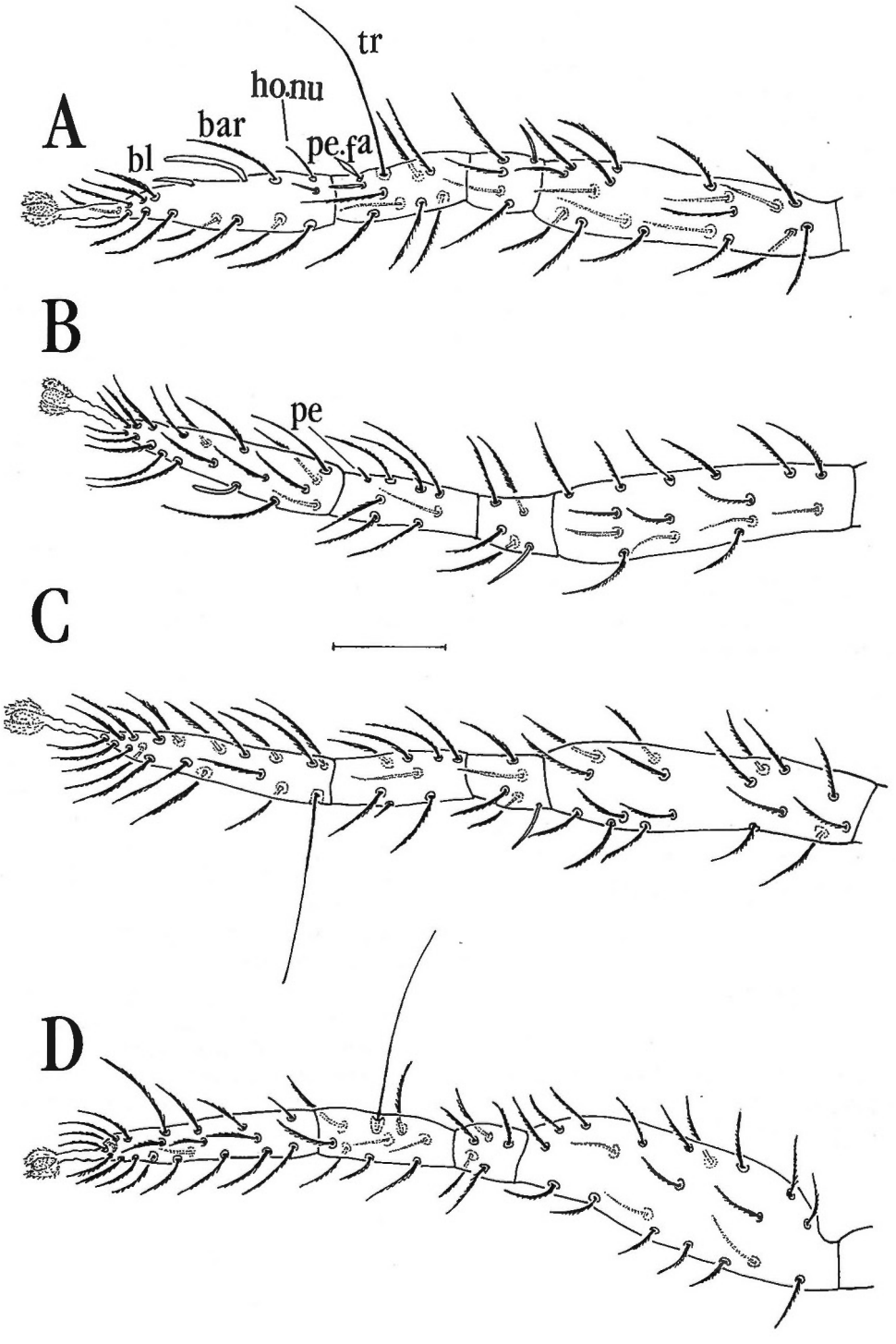


FIG. 3. *Trachymolgus jesusi* sp. nov., female holotype, dorso-lateral aspect of legs.
A. — Leg I. B. — Leg II. C. — Leg III. D. — Leg IV. Abbreviations: barbulate (bar); hollow nude (ho.nu); blunt sensory seta (bl); peglike setae (pe); falcate peglike setae (pe.fa); trichobothrium (tr). Scale bar represents 50 µm.

Leg	Cx	Tr	Fe	G	Tb	Ta
I	8 bar	2 bar	20 bar	4 bar, 1 ho.nu	14 bar, 1 bl, 1 pe.fa, 1tr.	21 bar, 2 ho.nu, 2 bl
II	5 bar	2 bar	15 bar	4 bar, 1 ho.nu	9 bar, 1 pe	21 bar, 1 bl
III	11 bar	2 bar	17 bar	4 bar, 1 ho.nu	9 bar, 1 bl	14 bar, 1 tr.
IV	10 bar	2 bar	20 bar	5 bar	10 bar, 1 tr	19 bal, 1 ho.nu

TABLE 2: Chaetotaxy of legs I–IV in males and females of *T. jesusi* sp. nov. Abbreviations: bar = barbulate; ho.nu = hollow nude; bl = blunt sensory seta; pe = peglike setae; pe.fa = falcate peglike setae; tr = trichobothrium

		Palp	Leg	Cx	Tr	Fe	G	Tb	Ta
Protonymph	Tr	4	I	3	1	6	5	3, 1 pe.fa, 1bl, 1tr	14, 2 ho.nu, 1 bl
	F	4	II	1	1	7	4, 1 ho.nu	5, 1 pe	16, 1bl
	G	3	III	5	1	5	4, 1 ho.nu	5, 1bl	14, 1tr
	Tbta	4, 1 ω	IV	0	0	0	0	1	7
Deutonymph	Tr	5	I	5	1	12	4, 1 ho.nu	5,1bl, 1pe.fa, 1tr	16, 2 ho.nu, 1bl
	F	4	II	2	1	13	4, 1 ho.nu	6, 1 pe	17, 1bl
	G	3	III	8	1	13	4, 1 ho.nu	6, 1 bl	14, 1tr.
	Tbta	4, 1 ω	IV	2	2	3	4	5, 1 tr	15, 1 ho.nu
Tritonymph	Tr	8	I	8	2	14	4, 1 ho.nu	8, 1 bl, 1pe.fa, 1trr	18, 2 ho.nu 1 bl.
	F	4	II	5	2	13	4, 1 ho.nu	7, 1 pe	20, 1bl
	G	4	III	10	2	15	4, 1 ho.nu	7, 1 bl	20, 1tr
	Tbta	4, 1 ω	IV	6	2	8	4	8, 1t	16, 1 ho.nu

TABLE 3: Developmental chaetotaxy of the pedipalps and legs. Abbreviations as in table 2; additional abbreviations for pedipalps: F = basifemur + telofemur; ω = solenidion.

ACKNOWLEDGEMENTS

Dr Warren ATYEO (University of Georgia, USA) is thanked for his helpful advice. Specimens were collected during the project IN2078/91 DGAPA, UNAM.

REFERENCES

ATYEO (W. T.), 1960. — A revision of the mite family Bdellidae in North and Central America (Acarina, Prostigmata). — Univ. Kansas Sci. Bull., **40**(8): 345-499

EVANS (G. O.), 1992. —Principles of Acarology. — C.A.B. International. Cambridge University Press, Cambridge. 563 pp.

GOMELAURI (L. A.), 1961. — [A new species of the family Bdellidae.] — Rep. Georgian Acad. Sci., USSR, **26**(1): 68-72 (in Russian).

THOR (S.), 1931. — Bdellidae, Nicoletiellidae, Cryptognathidae. — Tierreich, **56**:1-87.

SMITH (I. M.), LINDQUIST (E. E.) & BEHAN-PELLETIER (V.), 1996. —Assessment of species diversity in the mixedwood plain ecozone: mites (Acari). — Canadian Centre for Inland Waters, Borlington, Ontario (http://www.cciw.ca/eman-temp/reports/publications/Mixedwood/mites/intro.htm).