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A new genus and species of Podapolipidae (Acari: Heterostigmata) parasitic on *Physonota alutacea* (Boheman) (Coleoptera: Chrysomelidae; Cassidinae) in Mexico and Central America

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Abstract

Cassidopolipus physonota **gen. nov., sp. nov.** (Acari: Podapolipidae) is described from the tortoise beetle, *Physonota alutacea* (Boheman, 1854) (Coleoptera: Chrysomelidae, Cassidinae) collected in Mexico, Honduras and Costa Rica. Of the thirty-one genera of Podapolipidae, the new genus belongs to a group of sixteen genera with adult females having just four well-developed legs. Within this group, six genera also have males with a short, mid dorsal genital capsule. Keys to the six genera are provided.

Key words: Taxonomy, tortoise beetle, insect parasite, new genus, new species

Introduction

Mites in the family Podapolipidae are common parasites of a number of families of Coleoptera, and less commonly on Blattodea and Orthoptera. The family is represented by one species each on Heteroptera and Hymenoptera. They have not been found on Diptera, Lepidoptera, Odonata or any aquatic insects. In most instances, each family of parasitized Coleoptera will have genera of Podapolipidae that are associated with that family only. A conspicuous exception is the genus *Podapolipus*, which is found on beetles in four families as well as on insects in the orders Blattodea and Orthoptera.

Previous reports of Podapolipidae on Chrysomelidae have all been recorded species in the genus *Chrysomelobia* Regenfuss, 1968 (= *Parobia* Seeman and Nahrung, 2003) (Regenfuss, 1968, Eickwort, 1975, Drummond *et al*., 1984, Fain, 1987, Haitlinger, 1989, Houck, 1992, Morais, Husband and Lofego, 1999, Husband and Morais, 1999, Seeman and Nahrung, 2003, 2005, 2013, Husband and OConnor, 2004, Seeman 2008). Species of *Chrysomelobia* have been reported from Australia, Africa, Europe, North, Central and South America on leaf beetles belonging to the subfamily Chrysomelinae (the record of *C. donati* Haitlinger, 1989 from a cercopid hemipteran is probably accidental). While examining museum specimens of beetles in the chrysomelid subfamily Cassidinae, the junior author recovered podapolipid mites on the beetle, *Physonota alutacea* which did not belong to *Chrysomelobia*, but to a lineage of more derived Podapolipidae. The male, larva and adult female instars resembled mites in 16 genera with adult females with two functional pairs of legs, while adult *Chrysomelobia* females retain all four pairs of legs. Husband and Kurosa (2000) provided a pictorial key to mites of 15 genera whose females have two functional pairs of legs. Kurosa and Husband (2013) described a 16th genus, *Simalurapolipus*. The new genus described here is the 17th genus in this group.

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Materials and Methods

Examination of a large number of chrysomelid beetles representing primarily the subfamilies Chrysomelinae, Cassidinae and Hispinae in the collection of the University of Michigan Museum of Zoology (UMMZ) by the junior author over a number of years has yielded large numbers of mites, primarily belonging to the Astigmata (families Canestriniidae, Heterocoptidae, Histiostomatidae and Winterschmidtiidae). Among cassidine beetles, podapolipids were recovered only from one specimen of *Physonota alutacea*. Because no male mites were recovered in that collection, in 2013, the senior author examined another 98 beetles in the subfamily Cassidinae (Coleoptera: Chrysomelidae) in the UMMZ collection followed in 2014 by examination of 97 specimens of Cassidinae in the A. J. Cook Arthropod Research Collection of Michigan State University. Specimens of Podapolipidae were removed from the anterior abdominal tergites, and under the elytra, placed in 70% ethanol in vials and later on slides. Mites mounted on slides in Hoyer's mounting medium were placed on a heated drying tray for five days and ringed with red insulating varnish.

Measurements were taken with a Zeiss compound phase contrast microscope with a stage micrometer. Measurements are given in micrometers (μm). Vestigial setae, i. e. those represented by alveoli without setal remnants are designated as "v". Setae designated as microsetae (m) are no longer than the diameter of setal alveoli. Other terminology is based on Lindquist (1986).

Abbreviations for specimen depositories of the holotype and paratypes are: the A. J. Cook Arthropod Research Collection, Michigan State University, East Lansing, Michigan (CARC); The Acarology Laboratory, Museum of Biodiversity, The Ohio State University, Columbus, Ohio (OSAL); United States National Museum of Natural History, Washington, D. C. (NMNH) (mite collection housed in the USDA Systematic Entomology Laboratory, Beltsville, Maryland); National Museum of Nature and Science, Tsukuba 305-0005, Japan (NMNS); Queensland Museum, South Brisbane, Australia (QMBA); Tarbiat Modares University, Tehran, Iran (TMUI); Tamil Nadu Agricultural University, Coimbatore, India (TNAU); Coleccion Nacional de Acaros, Universidad Nacional Autonoma de Mexico, Mexico, D. F. (CNAC); University of Michigan Museum of Zoology, Ann Arbor, Michigan (UMMZ); Zoological Museum, University of Hamburg, Hamburg, Germany (ZMH).

Taxonomy

Podapolipidae Ewing, 1922

Cassidopolipus Husband and OConnor gen. nov. (Figs. 1–6)

Adult females with conspicuous stigmata, atria extending the length of prodorsal plate before branching of tracheoles, gnathosoma extending beyond the anterior border of the prodorsal plate, prodorsal plate with anterolateral projections. Prodorsal, C, D, and EF plates reticulate, undivided and with underlying alveoli-like structures, idiosoma with a pair of lateral lobes in engorgd specimens, a pair of elongate posteroventral lobes, each with an inconspicuous, vestigial leg III near the base, with a well sclerotized genital apparatus with hooks at the end of the reproductive tract, legs I longer than legs II, femur I seta *l'* thick, extending to the base of tarsus I, with tibia I seta *l"*, tarsus I with hooked seta *s*, spinous seta *pl*" and dorsal seta *tc'*, small clawless ambulacrum with a sucker; leg II anterior spinous seta *tc'* and spinous seta *u*" with three prongs. Male with mid-dorsal genital capsule oval, with paired setae *e* on crescent-shaped plate EF , capsule not extending to the plane of

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prodorsal setae sc_2, idiosomal setae other than setae *e* vestigial, microsetae or not evident, tibia I setae *l'* and *v'* spinous, tibiae II, III with three setae, setae *l"* not present. Larval female with cheliceral stylets longer than width of gnathosoma, with bases at anterolateral border of the gnathosoma, pharynx smaller than pharynx of adult female, plate D fused to larger plate C anteriomedially, prodorsal setae v_1 extend to bases of setae sc_2, setae v_2 vestigial, slightly posterior to setae v_1 and nearly in line with a line between bases of setae v_1 and sc_2, sc_1 not present. Setae sc_2 extending beyond the posterior margin of plate d, setae c_1, c_2 and *d* vestigial, setae *e* longer than legs III, bases of setae h_1 adjacent, h_1 longer than the width of the idiosoma, setae h_2 shorter than distance between setae h_2, tibiae I, II, III setae *d* longer than combined length of leg segments F-G-Ti-Ta, coxal setae 1*a*, 2*a* vestigial, 3*b* microsetae.

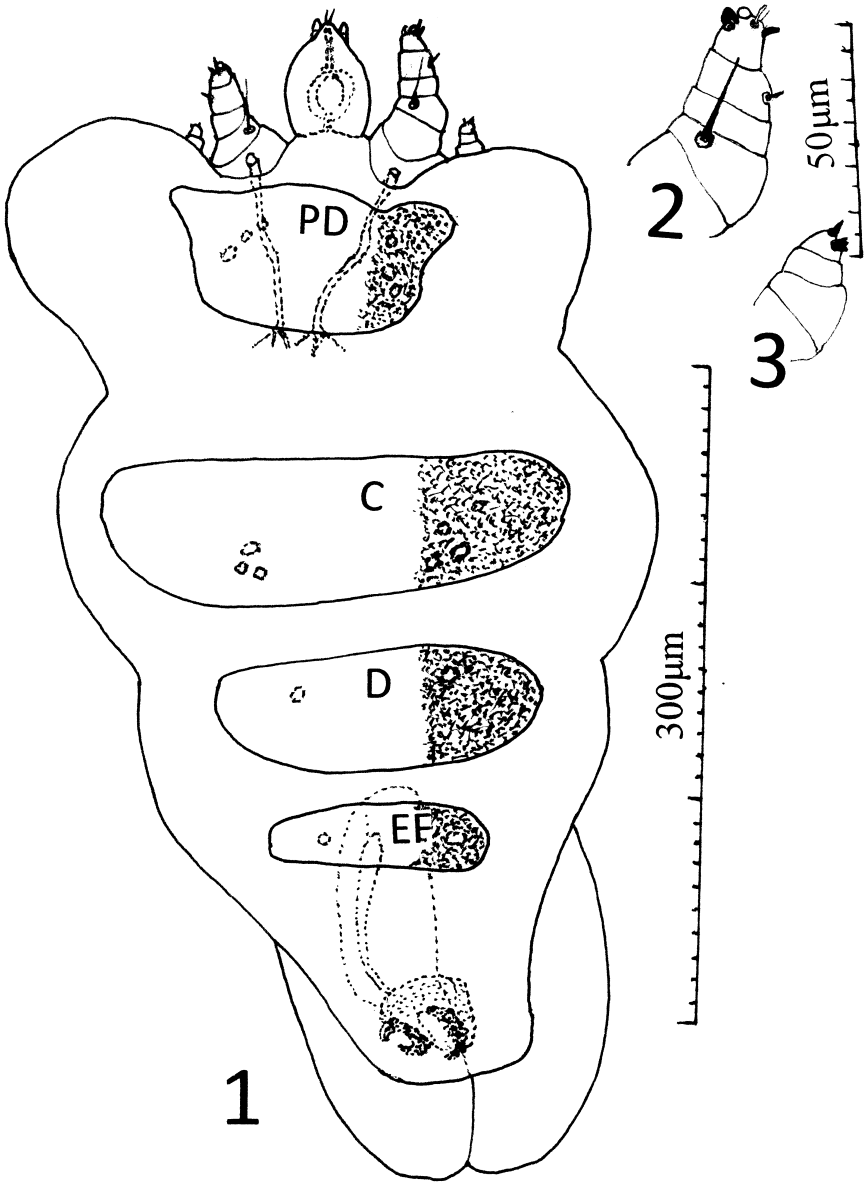


FIGURE 1–3. *Cassidopolipus physonota* Husband and OConnor **sp. nov.** (adult female). 1, dorsal; 2, leg I, dorsal; 3. leg II, dorsal.

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Type species. *Cassidopolius physonota* sp. nov.

Etymology. The genus is named for the host subfamily Cassidinae (Chrysomelidae).

Cassidopolipus physonota Husband and OConnor sp. nov. (Figs. 1–6)

Female (Figs. 1, 2, 3, 4, n=10). Gnathosoma length 54–65, width 40–60 (Table 1). Cheliceral stylets 20–30. Pharynx thick, width 21–30. Palps longer than wide, two segmented.

Idiosoma. Length 300–440, width 228–340, with lobes lateral to prodorsal plate and plate C and with paired lobes seeming to arise on the posteroventral idiosoma. Subdermal structures similar to setal alveoli on reticulated plates PD, C, D, and EF. Mid-shield lengths for plates PD 40–75, C 45–80, D 40–65, EF 20–49. Stigmata posteriolateral to base of gnathosoma, with atria as long as prodorsal plate, with branching tracheoles. Distance between stigmata 60–92. Venter with well sclerotized internal structure with hooks at end of reproductive tract. Sternal apodeme and apodemes I, II well sclerotized.

Legs. Femur I with setae *l*' thick, 15–25, tibia I with seta *l*" 3–5, tarsus I with seta *s* hooked, seta *pv*" m, seta *pl*" thin 5, seta *tc*' with blunt apex 5. Seta *tc*" spinous 5–6. Ambulacrum I sucker small, without a claw. Leg II smaller than leg I, tarsus II with terminal short, spinous setae *tc*' and seta *u*", *u*" apex tripartite. Poorly sclerotized vestiges of two-segmented legs III occur ventrally, below the anterior margin of dorsal idiosomal plate EF.

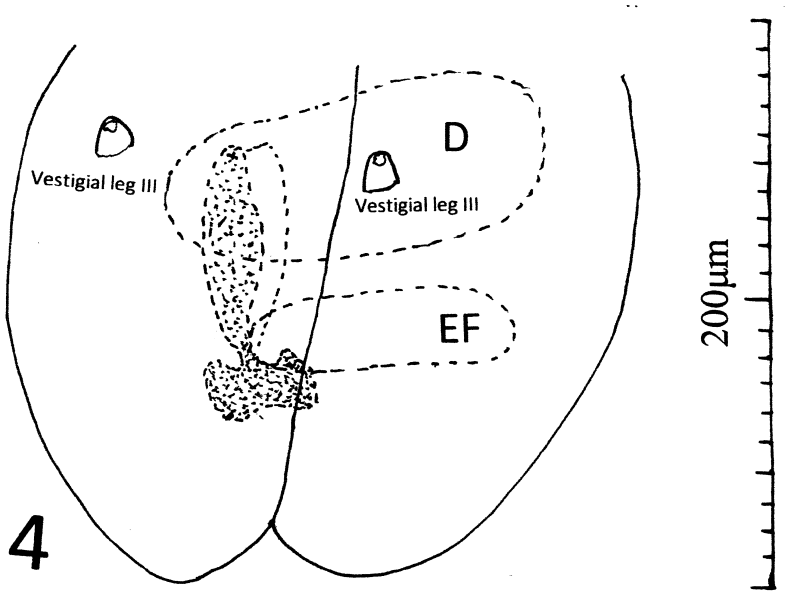


FIGURE 4. *Cassidopolipus physonota* Husband and OConnor **sp. nov.**, adult female, ventral view of legs III and posterior lobes of idiosoma.

Male (Figs. 5, 6, n= 5). Gnathosoma length 27–30, width 23–30. Cheliceral stylets 10–11, pharynx width 7–8, setae *ch*, *su* microsetae, palpi short, each of two segments with a short seta.

Idiosoma. Length 105–120, width 90–102, idiosomal setae v_1 m, v_2 v, located slightly medial to a line from v_1 to sc_2. Setae sc_2 and c_1, m, setae *e* 15. Distance between setae v_1–v_1 19, sc_2–sc_2 33, c_1–c_1 45, *e*–*e* 18. c_1–e 13. Genital capsule mid–dorsal, oval. Setae *e* located on a crescent-shaped plate EF anterior to the genital capsule.

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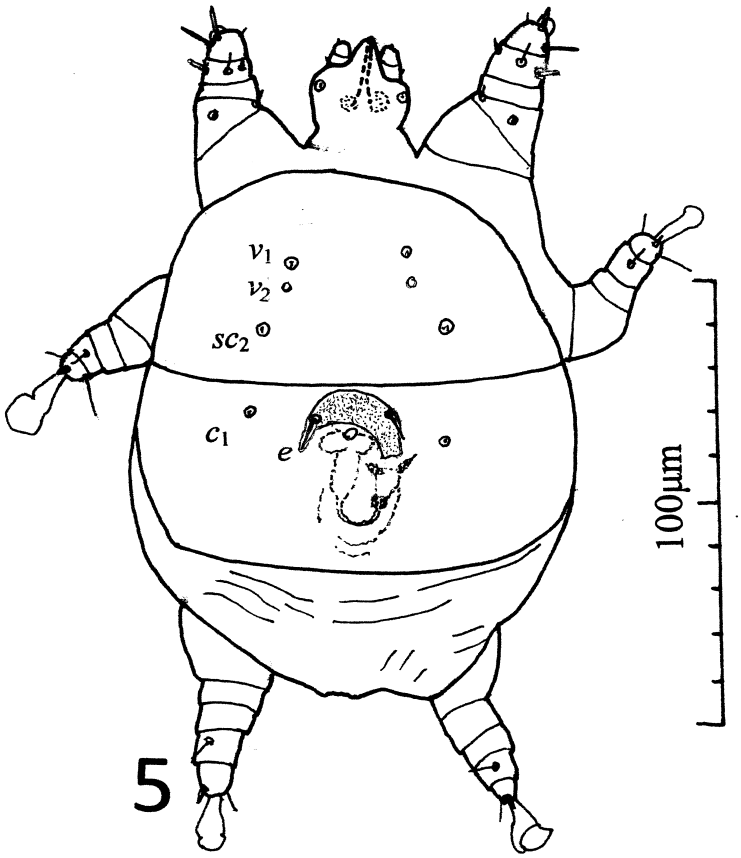


FIGURE 5. *Cassidopolipus physonota* Husband and OConnor **sp. nov.**, male, dorsal view.

Legs. Setation for femur, genu, tibia, tarsus of legs I, II, III; 3-1-5(+1)-8, 0-0-3-5, 0-0-3-5.

Tibia I, II, III setae *l*' spinelike, tibial II, III setae *l*" not present. Tibia I setae *v*' spinelike. No setae on genua, femora II, III. Ambulacrum I with one stout claw, ambulacra II, III with no claws, each terminating in a prominent sucker.

Larval female (Fig. 7, n=10). Gnathosoma length 54–70, width 55–77. Cheliceral stylets 88–110, pharynx width 10–15. Setae *ch* 40–50, *su* 11–17, distance *su–su* 25–38, palps two-segmented, with one short, thick seta on each segment.

Idiosoma. Length 155–237, width 130–198. Prodorsal seta v_1 49–63, distance v_1–v_1 50–60, v_2 vestigial, sc_2 117–140, distance sc_2–sc_2 76–84. Plate D fused with plate C anteromedially, c_1, c_2, *d* vestigial, c_2 directly lateral to c_1. Seta *e* 82–100, distance *e–e* 28–36, seta h_1 200–240, seta h_2 2–5. Venter with apodemes weakly developed, apodemes II extending to sternal apodeme, coxal setae 1*a*, 2*a* vestigial, some specimens with vestigial 2*b*. Setae 3*b* microsetae.

Legs. Setation for femur, genu, tibia, tarsus of legs I, II, III; 3-1-6(+1)-8(+1), 0-0-3-5, 0-0-3–5 (Table 2). Ambulacrum I with two short claws and a sucker, ambulacra II, III without claws. Femur I seta *l*' 8–10, *v*" 4–10, *d*, 10–19. Genu I seta *l*' 6–10. Tibia I seta *d* 72–98, solenidion φ 8–12, seta *k* 5–10. Tarsus I solenidion ω 2–3, setae *tc*', *tc*" 10–11. No setae on femora, genua II, III. Tibia II, III with setae *d* 60–90, setae *l*" absent. Tarsus II, III, with spinous setae *tc*' and *u*", *pl*' 10–12, *tc*" 13–19.

Egg (n=6). Length 232–250, width 142–170.

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TABLE 1. Maximum measurements in micrometers (μm) for *Cassidopolipus physonota* (*Cp*), *Tetrapolipus hunteri* (*Th*), *Buprestapolipus megachelus* (*Bm*), *Orthapolipus balboanae* (*Ob*), *Rhinopolipus lundi* (*Rl*), *Dilopolipus leei* (*Dl*).

	Cp	Th	Bm	Ob	Rl	Dl
ADULT FEMALE						
Idiosoma length	518	1260	670	1140	420	590
Idiosoma width	340	310	558	380	338	440
Gnathosoma width	60	80	80	65	45	60
Cheliceral stylet length	30	42	41	35	28	31
Gnathosomal setae *ch, su*	0	0	0	m	0	0
Stigmata	+	0	+	+	+	+
Paired posteroventral lobes	+	0	0	0	0	0
Genital tract, enlarged terminal unit	+	0	0	0	0	0
Vestigial legs III	+	0	0	0	0	0
	Cp	Th	Bm	Ob	Rl	Dl
MALE						
Idiosoma length	120	341	220	250	152	181
Idiosoma width	102	191	150	230	124	130
Gnathosoma width	30	40	37	36	28	32
Cheliceral stylet length	11	20	10	15	22	11
Genital capsule length	15	19	6	10	9	20
Genital capsule width	22	23	12	15	18	30
Plate EF setae *e*	15	0	0	0	0	0
LARVAL FEMALE						
Idiosoma length	275	330	265	231	158	223
Idiosoma width	198	268	210	193	117	187
Gnathosoma width	77	132	112	88	53	81
Cheliceral stylet length	110	267	202	180	66	89
Gnathosomal seta *ch*	50	95	62	58	35	39
Gnathosomal seta *su*	17	58	46	7	19	10
Prodorsal plate seta v_1	63	39	15	22	32	3
Prodorsal plate seta sc_2	140	10	137	175	83	122
Plate EF seta *e*	100	33	22	15	23	10
Seta h_1	240	396	283	230	145	407
Seta h_2	5	11	6	10	11	3

Type material. Holotype female: Mexico, Oaxaca, 2.41km SE El Cameron, 610 m, 15º53'34"N, 96º58'33", from the wild olive tortoise beetle, *Physonota alutacea* (Boheman), 1854 (UMMZ), collected by I. J. Cantrall and T. J. Cohn, 14-IX-1959, BMOC 11-0220-046-1. Deposited in UMMZ. Paratypes 34 females, 50 larval females, 12 eggs with same data as holotype; four females, three males, three larval females, one vial with additional non-paratype mites, Mexico, Michoacan, La Huacan, from *P. alutacea*, collected by Reyes, Halffter, Edmonds, 4-VII-1967 (CARC); one adult female, one male, four larval females, one egg, Mexico, Jalisco, one mile N. San Gabriel, 4,000ft. elev., from *Physonota* sp., collected by James A. Peters, 30-III-1949 (CARC); two adult females, three males, three larval females, one vial with non-paratype mites, Mexico, Vera Cruz, Minatitlan, from *P. alutacea*, collected by R. & K. Driesbach, 26-VIII to 1-IX-1961 (CARC);

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six adult females, seven larval females, one vial with additional non-paratype mites, Honduras, Choluteca, 0–10 km N Pespira, Teguchigalpa Rd., from *P. alutacea*, collected by T. H. Hubbell, 30-VII-1948, #167 (UMMZ); seven adult females, two males, two larval females, Honduras, La Ceiba, from *P. alutacea*, collected by G. V. Manley, 29-VII-1978 (CARC); one female, one larval female, Costa Rica, Guanacaste, Cañas, La Pacifica, from *Physonota* sp., collected by J. E. Zablotny, 5-VI–1984 (CARC). One adult female , one larval female to each of the following institutions: OSAL, NMNH, NMNS, QMBA, TMUI, CNAC, ZMH. Five adult females, four males and five larval females to CARC. Five males to UMMZ. The balance of paratypes from *Physonota alutacea* collected from Mexico, Oaxaca, 2.41km SE El Cameron, to UMMZ. The balance of paratypes from Costa Rica, Honduras and paratypes from Jalisco, Michoacan and Vera Cruz locations, Mexico to CARC.

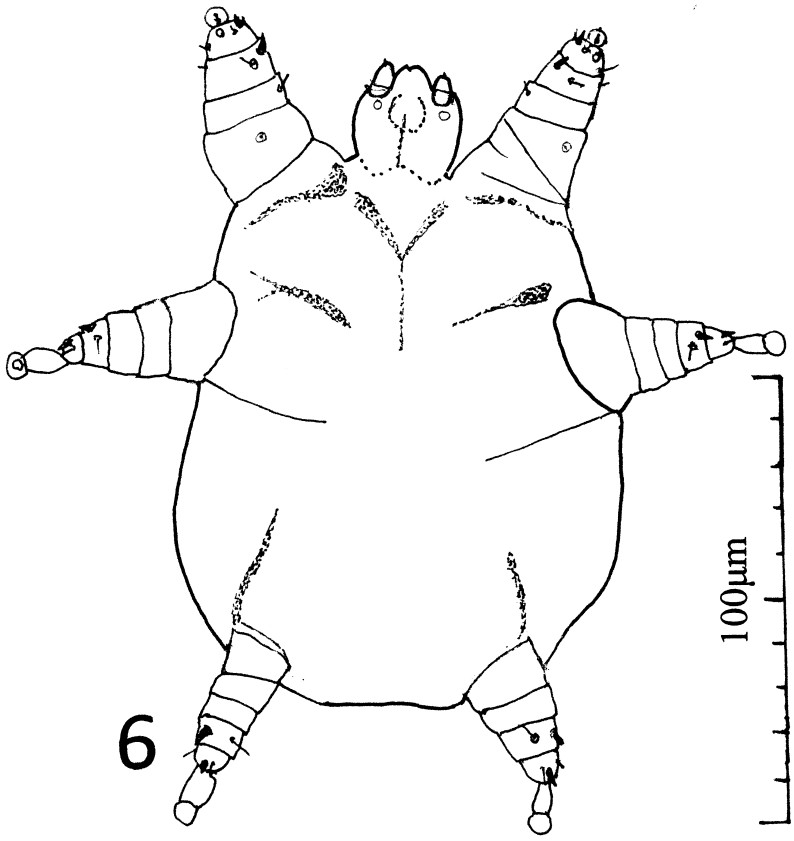


FIGURE 6. *Cassidopolipus physonota* Husband and OConnor **sp. nov.**, male, ventral view.

Etymology. The species is named for the genus of the host species *Physonota alutacea*.

Discussion

Of 16 genera of Podapolipidae with adult females having only two pairs of prominent legs, six genera have males with circular or oval genital capsules mid-dorsal and not extending to the plane of prodorsal plate setae sc_2: *Tetrapolipus* (host Cerambycidae), *Rhinopolipus* (host Curculionidae), *Buprestapolipus* (host Buprestidae), *Dilopolipus* (host Scarabaeidae), *Orthapolipus* (host Tettigoniidae) and the genus described herein, *Cassidopolipus* (host Chrysomelidae). Adult females of the six genera have the gnathosomas broad and long stylets. Female *Cassidopolipus* and

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Orthapolipus have idiosomal lobes lateral to the prodorsal plate, and the other four genera do not. Larval female *Cassidopolipus* and *Orthapolipus* each have three setae on femur I and one seta on genu I (Table 2). The pattern of leg setation for the three pairs of legs varies considerably among the six genera above. The spinous form of tarsi II, III setae *tc'* is present in male and larval female *Cassidopolipus* and in all other podapolipid genera except *Chrysomelobia*.

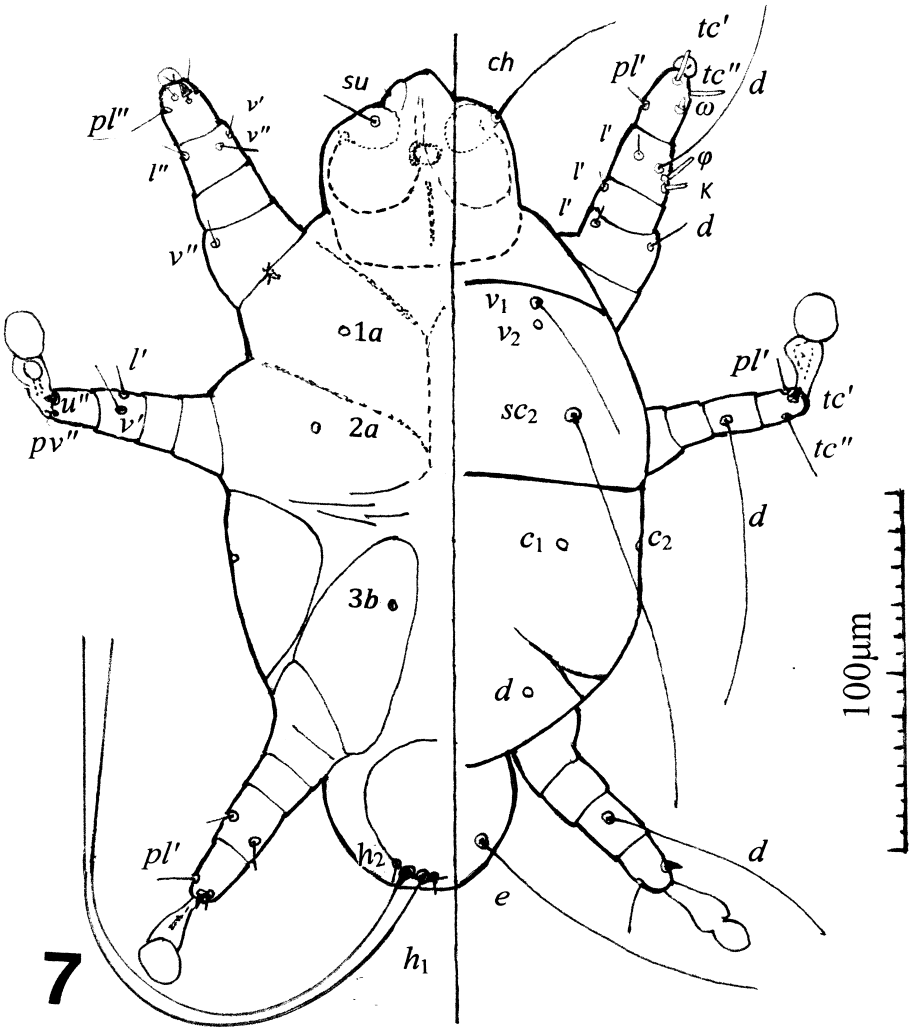


FIGURE 7. *Cassidopolipus physonota* Husband and OConnor **sp. nov.**, larval female, dorsal view on right, ventral view on left.

Males and larval females of *Cassidopolipus* lack tibia II, III setae *l*". These setae are present in the first five genera mentioned above. Adult female *Cassidopolipus* have a unique sclerotized terminus of the genital tract and the paired posterior ventrolateral lobes are present only in adult female *Cassidopolipus* and *Orthapolipus beeri* Husband et al. (2005). The pair of vestigial, two-segmented, ventral legs III found near the region of plate EF of *Cassidopolipus* is also unique. Plates C, D and EF are undivided in female *Cassidopolipus*, *Buprestapolipus* and most *Tetrapolipus*, divided in female *Dilopolipus* and not present in female *Rhinopolipus* or *Orthopolipus*. The propodosoma of female *Cassidopolipus* is as broad as the opisthosoma at the level of Plate C, and

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legs II are not visible anterior to the prodorsal plate. The propodosomae in female *Buprestapolipus* and *Tetrapolipus* are narrower than the remainder of the idiosoma and legs II are visible anterior to the prodorsal plate. Setae v_1 and *e* of larval female *Cassidopolipus* are longer than setae v_1 and *e* of larval females of the genera above except for larval *Tetrapolipus seemani*. Larval female *T. seemani* are unique among podapolipid mites in having the idiosoma exceeding 500 micrometers, longer than the idiosomas of any other larval podapolipid mite. A rectangular idiosomal plate EF, with or without short setae *e*, occurs in males of several species of *Chrysomelobia* that have posterodorsal genital capsules. This plate is also present in male *Cassidopolipus* but is crescent-shaped with uniquely long setae.

TABLE 2. Leg setation for femur, genu, tibia, tarsus of legs I–III of larval female mites with adult females with two conspicuous pairs of legs and males with short mid-dorsal genital capsules. Solenidia are in parentheses. The genus *Curculipolipus* is included as the only other genus of Podapolipidae with tibiae II, III of larval females with three setae at present. Tibiae II, III setae *l'* of larval female *Chrysomelobia pagurus* Seeman 2008 are minute, and larval females of *C. verecundus* Seeman 2008 are not reported (Seeman, 2008). The potential exists for the discovery of larval instars of species of the genus *Chrysomelobia* with three tibiae II, III setae. Tibia I solenidion φ is designated distal (D), lateral (L) or proximal (P) in reference to its position in relation to tibial seta *d*. Tarsus I solenidion ω is designated distal (D), medial (M) or proximal (P) in relation to its position on tarsus I.

Family and genus	Leg I				Leg II				Leg III			
	F	G	Ti	Ta	F	G	TI	Ta	F	G	Ti	Ta
Host Cerambycidae												
Tetrapolipus	2	2	6(+1L)	7(+1D)	0	1	4	5	0	0	4	5
Host Chrysomelidae												
Cassidopolipus	3	1	6(+1L)	8(+1D)	0	0	3	5	0	0	3	5
Host Tettigoniidae												
Orthapolipus	3	1	6/7(+1L)	8(+1M)	2	1	4	4	0	1	4	4
Host Curculionidae												
Rhinopolipus	3	2	6(+1L)	7(+1D)	1	0	4	5	0	0	4	5
Curculipolipus	3	3	6(+1L)	7(+1D)	1	0	3	4	0	0	3	4
Host Buprestidae												
Buprestapolipus	1	3	6(+1D)	7(0)	1	1	4	4	0	1	4	4
Host Scarabaeidae												
Dilopolipus	1	3	6(+1D)	7(+1D)	1	1	4	4	0	1	4	4
	F	G	Ti	Ta	F	G	TI	Ta	F	G	Ti	Ta

Although thousands of beetles from all continents except Antarctica have been examined for parasitic podapolipid mites by the authors and their colleagues, this effort represents a small fraction of one percent of Coleoptera that are potential hosts for mites in the family Podapolipidae. Similarly, publications dealing with biology or distribution of mites in the family Podapolipidae represent only a fraction of the studies devoted to the taxonomy of the family. It is not a common practice among entomologists to lift elytra of beetles to examine them for mites. In addition, tracheae and genital tracts of beetles and other insects are rarely examined for podapolipid mites such as *Locustacarus*

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and *Ovacarus*. We anticipate more discoveries and additions to the knowledge of this unusual family of obligate parasites of terrestrial insects as more insects are examined for them. Not many families show the range of adaptations to parasitism such as (1) reduction in instars from as many as five to two (egg to sexually mature adult male), (2) reduction of legs from 8 to 0 in adult females, (3) male genitalia ranging in position from posterior to dorsal to extending freely over the gnathosoma and (4) male genital capsules varying in shape from small and round to broad or narrow and elongate.

Key to genera of female tetrapodid Podapolipidae with males with genital capsules terminating middorsally on fused opisthosomal plates C and D. Numbers in () = number of species per genus.

Key to genera of adult females

1 Femur I seta *l'* elongate 2
– Femur I seta *l'* shorter than length of femur I or absent. 4
2 Plates C, D, EF entire, reticulate surface 3
– Plates C, D. EF divided, smooth surface, host Scarabaeidae, New Guinea, Indonesia, (1). . . . *Dilopolipus*
3 Tibia II with seta *l"*, idiosoma with narrow propodosoma and broad hysterosoma, without posteroventral lobes, without vestigial legs III, host Buprestidae, Central and South America (1) **. . . . . ..***Buprestapolipus*
– Tibia II without setae, idiosoma with propodosoma and hysterosoma equally broad, with posteroventral lobes, with vestigial legs III, host Chrysomelidae, Cassidinae, Mexico, Central America(1). . . . . *Cassidopolipus* **gen. nov.**
4 Without femur I seta. 5
– With short femur I seta, host Curculionidae, Guadalcanal Is., Pacific (1). . . . . *Rhinopolipus*
5 Stigmata conspicuous, propodosoma as wide as hysterosoma, without opisthodsoral plates, host Tettigoniidae, Central and South America, Indonesia, Republic of Palau (4). . . . . *Orthapolipus*
– Stigmata inconspicuous or absent, propodosoma narrower than hysterosoma, with or without opisthodorsal plates, host Cerambycidae, Central Africa, S. India, Sri Lanka, Malaysia, Indonesia, Philippines, New Guinea, Northern Australia (8). . . . . *Tetrapolipus*

Key to genera of larval females

1 With one or two femur I setae 2
– With three femur I setae 4
2 With one femur I setae and three genu I setae, with femur II seta *l'* and genu III *l'* 3
– With two femur I setae and two genu I setae, without femur II seta *l'*, without genu III *l'*, host Cerambycidae, Central Africa, S. Asia, Indonesia, Northern Australia (8) . . . . . *Tetrapolipus*
3 Gnathosomal seta *su* long, near two times distance *su–su*, setae c_1, c_2, *d* long, 11–28, host Buprestidae, Central and South America (1). . . . . *Buprestapolipus*
– Gnathosomal setae *su* short, near ½ distance *su–su*, setae c_1, c_2, *d* short, 3–8, host Scarabaeidae, New Guinea (1) . . . . . *Dilopolipus*
4 With four tibiae II, III setae, with femur II seta 5
– With three tibiae II, III setae, without femur II seta, host Chrysomelidae (Cassidinae), Mexico, Central America (1). . . . . *Cassidopolipus* **gen. nov.**
5 With genua II, III setae, gnathosomal seta c_2, *d*, *e* short, 6–8, host Tettigoniidae, Central and South America, Indonesia, Republic of Palau (4) . . . . . *Orthapolipus*
– Without genua II, III setae, setae c_2, *d*, *e* long, 18–23, host Curculionidae, Guadalcanal Is., Pacific (1) . . . . . *Rhinopolipus*

Key to genera of males.

1 With four tibia II, III setae, without idiosomal plate EF 2
– With three tibia II, III setae, with crescent-shaped plate EF and elongate setae *e*, host Chrysomelidae (Cassidinae), Mexico, Central Americ (1) . . . . . *Cassidopolipus* **gen. nov.**

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2 With femur II seta. 3
– Without femur II setae, host Cerambycidae, Central Africa, S. Asia, Indonesia, Northern Australia (8) . . . . . *Tetrapolipus*
3 With genua II, III setae. 4
– Without genua II, III setae, host Curculionidae, Guadalcanal Is., Pacific (1) . . . . . *Rhinopolipus*
4 Setae sc_2 vestigial or microseta. 5
– Length of setae sc_2 nearly equal to length of distance between sc_2, host Tettigoniidae, Central and South America, Indonesia, Republic of Palau (4) . . . . . *Orthapolipus*
5 Genital capsule in plane of setae c_1, tibia III setae, *v'*, *v"* no longer than width of tibia III, host Scarabaeidae, New Guinea(1). . . . . *Dilopolipus*
– Genital capsule anterior to plane of setae c_1, tibia III setae *v'*, *v"* longer than length of leg distal to setae *v'*, *v"*, host Buprestidae, Central and South America (1) . . . . . *Buprestapolipus*

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