

**A new genus for Nearctic *Pleurophorus ventralis* HORN, 1887,
with phylogenetic inferences
(Coleoptera: Scarabaeidae: Aphodiinae: Aphodiini)**

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Abstract. *Hornietus* gen. nov. for Nearctic *Pleurophorus ventralis* HORN is described and placed in the tribe Aphodiini. Cladistic analysis shows a sister group relationship between new genus and the Aphodius-complex.

Key words: Scarabaeidae, Aphodiinae, Aphodiini, new genus, phylogeny, Nearctic.

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I. INTRODUCTION

Recently, while examining the material from the U. S. National Museum of Natural History in Washington DC (USNM), I found a series of specimens identified as *Saprosites ventralis*. This species was originally described by HORN (1887) in the genus *Pleurophorus* MULS. belonging to the tribe Psammodiini, and subsequently transferred by CHAPIN (1940) to *Saprosites* REDT. in the tribe Eupariini. Although the species is similar in a general appearance to the members of *Saprosites*, a number of consistent character states separate it from *Saprosites* and from other species of the tribe Eupariini and appear to warrant generic status in the Aphodiini complex.

A c k n o w l e d g e m e n t s. I wish to express my sincere thanks to Dr. Wanda WEINER for introducing to Hennig86 and Clados procedures.

Hornietus gen. nov.

T y p e - s p e c i e s *Pleurophorus ventralis* HORN, 1887.

D i a g n o s i s. Body elongate, glabrous. Head moderate in size, elevated at middle; gena small, weakly prominent. Pronotum transverse, slightly tumid in anterior fourth, anterior angles rounded, not produced, posterior angles truncate; lateral and basal marginal line strong, grooved with row of large punctures inside groove. Scutellum rounded at apex. Elytra lobed apically, lacking basal margination, humeral denticles small, acute; epipleural margin distinctly upturned in posterior half with row of punctures of the same size as those along pronotal margin; elytral striae deep,

punctures elongate, softly crenating inner side of intervals; intervals 1-4 parallel from base to apex, intervals 5,7,9 united before apex, interval 8 short. Mesosternum convex, scabrous with smooth carina in posterior half; mesocoxae strongly oblique, space between mesocoxae very small; lateral metasternal triangle broad with coarse punctures inside; abdominal sternites glabrous, sutures smooth without trace of fluting, sternites 1-2 short, sternites 3-4 or 3-5 each with triangular concavity at middle of suture; pygidium softly sclerotized, covered with elytra, invisible from ventral side. Legs moderate in length; all femora equal in width, tibiae as long as femora; lateral teeth of protibia small, separate; meso- and metatibiae with distinct transverse ridges; apex of metatibia with fringe of long and shorter setae, spurs thin, separate, located on each side of tarsal insertion; metatarsus as long as tibia, claws hornlike.

Remarks. The epipharyngeal structures (Fig. 3) are similar to those found either in the tribe Eupariini and Aphodiini. The male genitalia (Figs 1-2) are unusual in shape, the phallobase and internal structures similar to those of the tribe Aphodiini.

Hornietus ventralis (HORN) comb.nov.

(Figs 1-3)

Pleurophorus ventralis HORN, 1887: 91-92.—SCHMIDT 1922: 491.

Saprosites ventralis: CHAPIN 1940: 10; CARTWRIGHT 1948: 131.

Platytomus ventralis: DELLACASA 1988: 309 (catalogue).

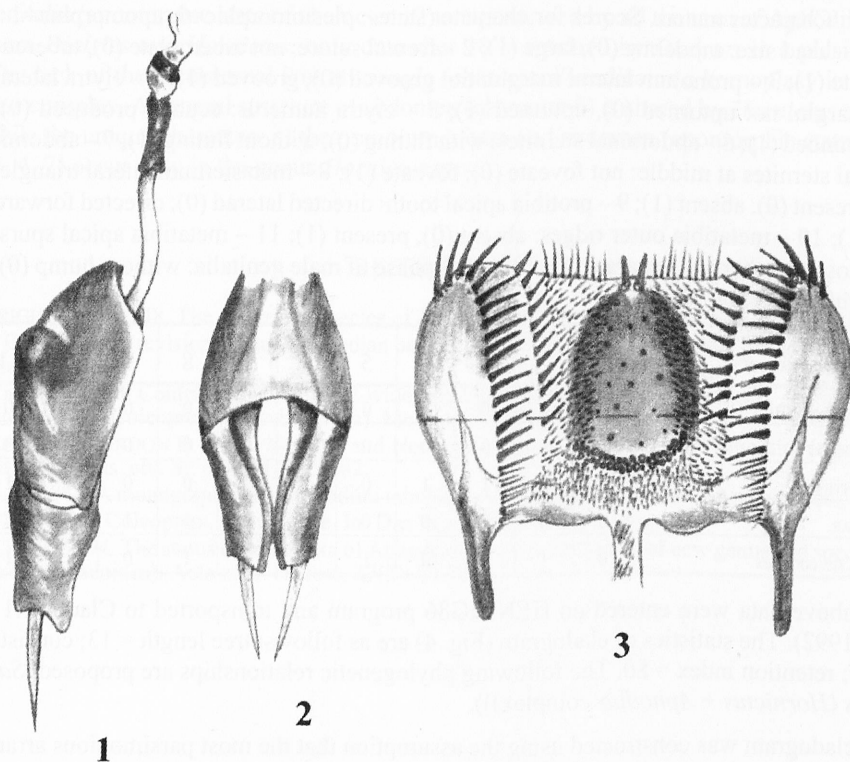
M a t e r i a l e x a m i n e d. Type 'Canada (Ontario)', in USNM. Other specimens (7): 1 – Washington DC., coll. M. L. LINELL; 1 – Washington DC., Rock Creek Park, 24.I.1967, in tree hole, M. SUTER; 1 – Maryland, Takoma Park, 4.V.1969, flying at dusk, H. TYSON; 3 – Marlboro Md., 13.V.1940, H.S. BARBER; 1 – Anchorage, Jefferson Co. Ky, 30.IV.1952, B.L. MONROE. Specimens are in: ISEA, USNM.

D e s c r i p t i o n. Length 3.8–4.0 mm, greatest width 1.2-1.3 mm. Body shining; colour castaneous, antennal club yellowish brown. Clypeal margin truncate or very slightly emarginate, sides arcuate toward rounded gena; frontal suture indicated by fine line, punctures from anterior margin to frontal suture minute, scattered, those of vertical area a trifle larger but not closer. Pronotum convex, sides straight to widely truncate posterior angles; pronotal surface in anterior fourth slightly tumid, shining, impunctate, punctures posteriorly moderate in size, uniformly distributed, separated by slightly more than one diameter. Scutellum impunctate. Elytra almost parallel-sided, epipleura only slightly narrowed before apex with row of large punctures on under side; elytral striae strongly impressed, punctures elongate, softly crenating inner margins of intervals, those on apical declivity of elytra coarser, forming small pits; intervals strongly convex, smooth, impunctate. Flight wings functional. Ventral surface shining; disc of metasternum concave, midline fine with small fovea anteriorly; abdominal sternites glabrous, impunctate; pygidium feebly sclerotized with 6-8 hairs, sculpture similar to that of tergites. Profemur with very fine perimarginal groove, surface shining; apex of mesotibia with two setiform spurs located close together below tarsal insertion; metatibia at inner side with few long setae and shorter setae apically, spurs equal in length, separate; tarsal joints cylindrical, basal segment of metatarsus as long as tibial spurs and subequal in length to following two tarsal segments combined. Epipharynx as in Fig. 3.

Male. Pronotum wider than in female, elytra slightly narrower; abdominal sternites 3-4 with triangular concavities at middle; terminal spur of protibia longer than in female, hooked inwardly. Genitalia as in Figs 1-2.

Female. Abdominal sternites 3-5 with triangular concavities at middle, terminal spur of protibia shorter than in male, straight.

R e m a r k s. HORN (1887) described *Pleurophorus ventralis* on the basis of two specimens collected in Canada (Ontario) and at Washington DC. CHAPIN (1940) transferred this species to the



Figs. 1-3. *Hornietus ventralis* (HORN): 1 – aedeagus in lateral view, 2 – parameres in dorsal view, 3 – epipharynx.

genus *Saprosites* on the basis of a series of specimens listed above (see Material examined) and commented by him as follows: 'One collection of this species was made by H.S. BARBER at Marlboro Md., in the galleries of *Popilius disjunctus* (ILLIGER), where it may have been feeding on the frass pellets. In other cases specimens have been recorded as collected under bark.'

II. PHYLOGENETIC ANALYSIS

Homoplasy is common among Aphodiinae and results in serious difficulties when attempting phylogenetic inferences. I considered here 12 characters with 24 character states of the following taxa:

- 1 – Neotropical species of the genus *Saprosites* REDT.
- 2 – Nearctic species of the genus *Dialytes* HAR.
- 3 – Holarctic species of the genus *Aphodius* sensu stricto
- 4 – Nearctic species *Hornietus ventralis* (HORN).
- 5 – Nearctic-Neotropical species *Ataenius platensis* (BLANCH.), as functional outgroup.

The character state distributions for the above taxa are listed in Table 1

Table I

Character matrix. Scores for character states: plesiomorphic=0; apomorphic=1
1 – head size: moderate (0), large (1); 2 – frontal suture: not tuberculate (0), tuberculate (1); 3 – pronotum lateral margin: not grooved (0), grooved (1); 4 – elytra lateral margin: not upturned (0), upturned (1); 5 – elytra humerus: acutely produced (0); rounded (1); 6 – abdominal sternites: with fluting (0), without fluting (1); 7 – abdominal sternites at middle: not foveate (0), foveate (1); 8 – metasternum lateral triangle: present (0), absent (1); 9 – protibia apical tooth: directed laterad (0); directed forward (1); 10 – metatibia outer ridges: absent (0), present (1); 11 – metatibia apical spurs: close together (0), separate (1); 12 – phallobase of male genitalia: without hump (0), with hump (1).

Characters	1	2	3	4	5	6	7	8	9	10	11	12
<i>Ataenius platensis</i> (BL.)	0	0	0	0	0	0	0	0	0	0	0	0
<i>Saprosites</i> REDT.	1	0	0	0	0	0	0	0	0	0	0	0
<i>Hornietus</i> STEBN.	0	0	1	1	0	1	1	0	0	1	1	1
<i>Dialytes</i> HAR.	0	0	0	0	0	0	0	1	1	0	1	1
<i>Aphodius</i> s.str. complex	0	1	0	0	1	1	0	1	0	1	1	1

The above data were entered on HENNIG86 program and transported to Clados 1.1 version (NIXON 1992). The statistics of cladogram (Fig. 4) are as follows: tree length = 13; consistency index = 93; retention index = 80. The following phylogenetic relationships are proposed: *Saprosites* (*Dialytes* (*Hornietus* + *Aphodius* complex))).

The cladogram was constructed using the assumption that the most parsimonious arrangement of shared, derived character states with the fewest reversals best infers genealogical relationship. The greatest significance was attributed to these characters that generally appear rarely or not at all in the representatives of Eupariini (*Ataenius* + *Saprosites*). The genus *Dialytes* HAR. (STEBNICKA 1994; DELLACASA & GORDON 1997) includes four species sharing the general characters of the

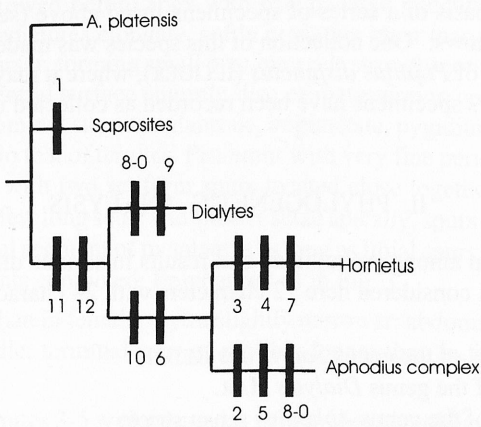


Fig. 4. Cladogram. Numbering of characters corresponds to that in the character matrix (Table I). Reversals indicated by –0, length of speciation sequences by shorter and longer lines.

head, epipharynx, abdomen, legs and aedeagus and representing the sister taxa to *Hornietus* + *Aphodius* complex. The characters of metatibia (apomorphic state of characters 10, 11) and of the male genitalia (apomorphic state of character 12) are possessed by all the taxa of Aphodiini and by the genera *Dialytes* and *Hornietus*, only character 10 is retained by *Dialytes* in a plesiomorphic state. The lack of the metasternal lateral triangle (character 8) indicates a homoplasy in *Dialytes*-*Aphodius* complex. A general structure of abdomen (character 6) is shared by *Hornietus* and *Aphodius*, while the unique characters of the pronotum, elytra and abdomen (apomorphic states of characters 3, 4, 7) occur only in the genus *Hornietus* nov.

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