

Species group 3 (sp.gr. pustulatus)

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Pronotum: Pale ferrugineous, basally in middle with a vague ferrugineous area. Finely and rather sparsely punctate. Laterally punctures slightly finer and sparser. Rather shiny, microsculptured (almost whole pronotum with clearly discernible meshes). Sides of pronotum slightly rounded.

Elytra: Dark ferrugineous to ferrugineous, without distinct colour pattern. Fairly coarsely and densely punctate. Apically punctation distinctly finer and sparser. Without distinct rows of punctures. Shiny, very fine partly obliterated microsculpture may be discerned. Microsculpture apically quite distinct. Epipleura pale ferrugineous, coarsely punctate, shiny and not microsculptured.

Ventral side: Pale ferrugineous. Fairly coarsely and densely punctate. Four apical sternites with distinctly finer punctation (apical sternite impunctate). Shiny, abdomen slightly mat and microsculptured. Prosternal process laterally very finely and rather indistinctly margined. Medial surface of process flat, indistinctly punctate.

Legs: Pale ferrugineous to ferrugineous. Protarsus slightly broadened. Mesotarsus broad, last joint long, claws asymmetric (one claw strongly extended) (Fig. 46; illustrated from different angles).

Male genitalia: Figs 47–49.

Female: Elytra distinctly microsculptured. Mesotarsi not distinctly modified.

Distribution: Argentina (Fig. 42).

Biology: Unknown.

6.5.3. Species group 3 (sp.gr. *pustulatus*)

Hydrovatus cardoni Severin

Figs 50–56.

Hydrovatus cardoni SEVERIN, 1890:CLXXXIX (orig. descr., faun.); 1892:472 (list.); RÉGIMBART, 1899b:232 (descr., faun.); ZIMMERMANN, 1919:127 (faun.); 1920a:32 (faun., list.); VAZIRANI, 1970b:96 (descr., faun.); 1972:120 (faun.); 1977a:27 (faun.).

Type locality: Konbir, India.

Type material studied: Holotype, f: Konbir/f/Type/Type (MNHN).—Paratypes: 1202/Konbir Cardon/Coll. Severin Determin. Régimb. 1890/G. Severin det. 1890: *Hydrovatus cardoni* Severin/Type/R. Mus. Hist. Nat. Belg. Mouchamps (1 ex. ISN); same as preceding but labelled Cetara (1 ex. ISN); *Hydrovatus cardoni* Sev. Type Cetara–Bengale (2 exx. MNB); Bengalen Konbir/Type (2 exx. ZSM); Bengalen/Type (2 exx. ZSM).

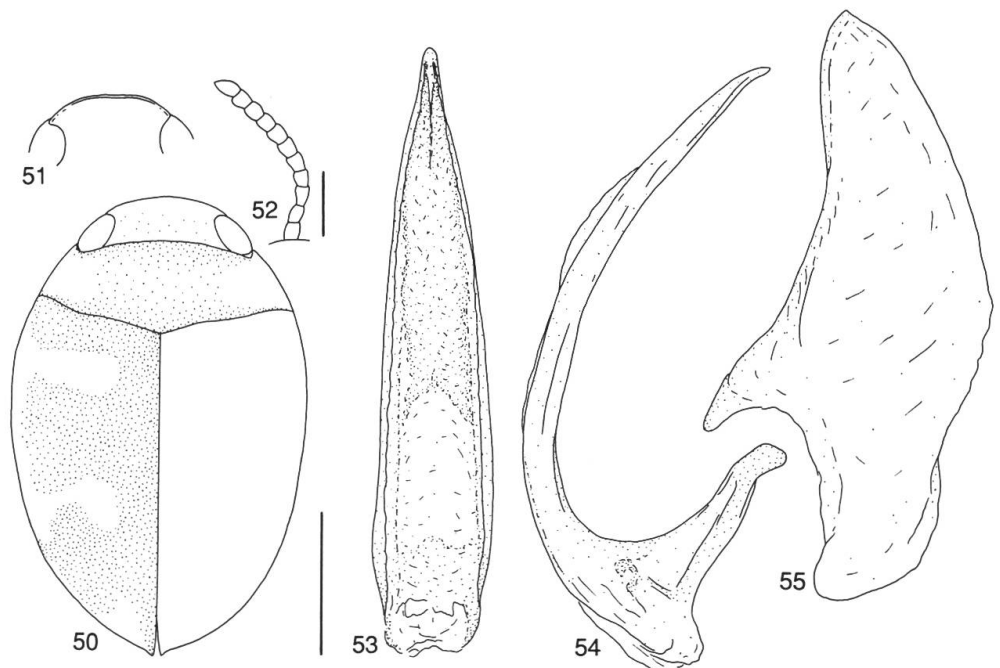
Additional material studied: India: Bengale/*H. cardoni* Sev. det. Severin (4 exx. MCG, belong possibly to type material); Konbir (1 ex. MNHN). In all, 14 exx.

Diagnosis: A distinct species which is particularly characterized by the well-marked elytral colour pattern and by the male genitalia: Penis in dorsal view almost evenly narrowing towards apex; paramere without apical hook.

Length of body: 2.86–2.92 mm, breadth: 1.86–1.90 mm. Body quite broad, with distinct colour pattern (Fig. 50).

Head: Pale ferrugineous. Finely and rather sparsely punctate. At eyes and in shallow frontal depressions punctures distinctly denser. Slightly mat, microsculptured (meshes distinct). Head frontally rounded, medially straightened and from eye to eye finely margined. Close to eyes frontal margin indistinct (Fig. 51). Antenna pale ferrugineous, rather slender (Fig. 52).

Pronotum: Dark ferrugineous to ferrugineous. Laterally pronotum becomes gradually paler, at rounded sides pronotum pale ferrugineous. Anteriorly and posteriorly with a fairly distinct blackish area (Fig. 50). Rather finely and densely punctate. Laterally punctures finer, sparser and more irregularly distributed. Rather shiny, although microsculptured (meshes quite distinct).



Figs 50–55: *Hydrovatus cardoni*. – 50, habitus. – 51, head, frontal aspect. – 52, male antenna. – 53, penis, dorsal aspect. – 54, penis, lateral aspect. – 55, paramere. Left top scale 0.25 mm, antenna; left bottom scale 1 mm, habitus; right scale 0.5 mm, genitalia.

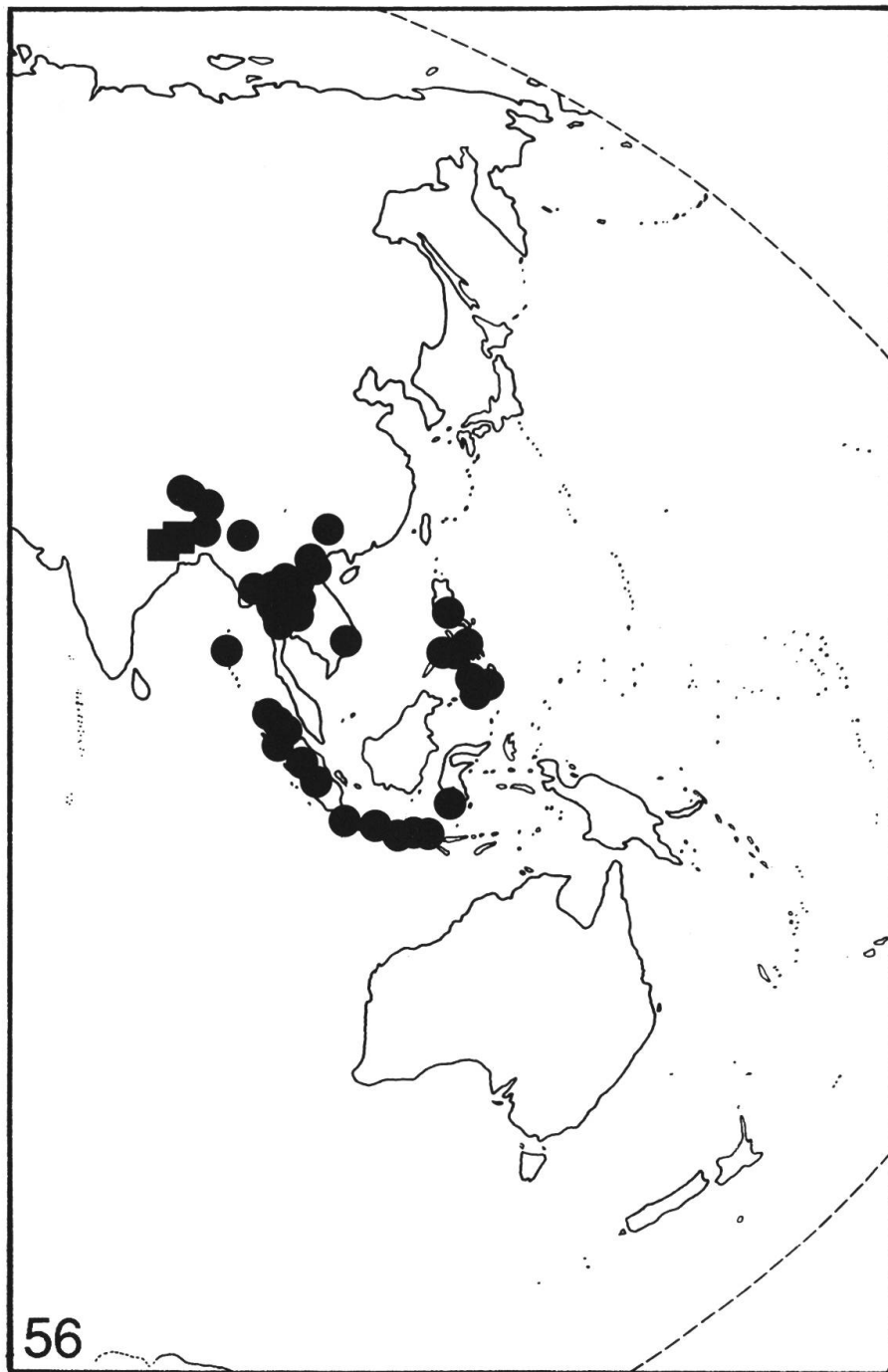


Fig. 56: Distribution of *Hydrovatus cardoni* (square) and *H. subrotundatus* (dot).

Elytra: Blackish to dark ferrugineous, with quite distinct pale ferrugineous spots (Fig. 50). Finely and somewhat sparsely punctate. Laterally punctation distinctly finer and more irregularly distributed. Rows of punctures almost absent. Only a few fine, scattered punctures indicate lateral rows. Rather shiny, very finely and quite

indistinctly microsculptured (meshes partly indistinct). Epipleura pale ferruginous, rather indistinctly punctate, rather shiny although finely reticulated.

Ventral side: Ferruginous to pale ferruginous. Fairly coarsely but somewhat sparsely punctate. Abdomen almost impunctate, except basally with rather fine punctures. Shiny, almost without microsculpture, except abdomen, submat, finely microsculptured. Prosternal process finely margined, medial surface slightly convex, finely punctate.

Legs: Pale ferruginous. Pro- and mesotarsi somewhat broadened.

Male genitalia: Figs 53–55.

Female: Externally as male.

Distribution: India (Fig. 56).

Biology: Unknown.

Hydrovatus subrotundatus Motschulsky

Figs 56–62.

Hydrovatus subrotundatus MOTSCHULSKY, 1859:41 (orig. descr., faun.); 1869:29 (faun.); SHARP, 1882a:815 (descr., faun.); BRANDEN, 1885:27 (faun.); RÉGIMBART, 1899b:239 (faun.); ZIMMERMANN, 1920a:36 (faun., list.).

Hydroporus carbonarius CLARK, 1863:423 (descr., disc., faun.); SCHAU, 1868:28 (disc., faun.); SHARP, 1882a:790 (descr., disc., faun.).

Hydrovatus carbonarius (CLARK), BRANDEN, 1885:25 (faun.); RÉGIMBART, 1899b:232 (descr., faun.); JAKOBSON, 1905:419 (faun.); ZIMMERMANN, 1919:126 (disc.); 1920a:32 (faun., list.); WINKLER, 1924:218 (faun.); ZIMMERMANN, 1927:19, 20 (descr., faun.); 1930:30 (descr., faun.); BALL, 1932:18 (disc.); FENG, 1932:21 (faun., list., by mistake: *H. carbonarius*); 1933a:331 (disc., faun.); 1933b:92 (descr., faun.); WU, 1937:203 (faun.); GUIGNOT, 1956g:57 (descr., faun.); VAZIRANI, 1977a:26 (faun.); ZHAO, 1981:11 1 (faun.). **New Synonym.**

Hydroporus carbonarius var. *fuscobrunneus* CLARK, 1863:423, 424 (orig. descr., faun.).

Hydrovatus carbonarius var. *fuscobrunneus* (CLARK), RÉGIMBART, 1899b:233 (descr., disc., faun.); JAKOBSON, 1905:419 (faun.).

Hydrovatus carbonarius ab. *fuscobrunneus* (CLARK), ZIMMERMANN, 1920a:32 (faun.); 1927:21 (descr.); 1930:31 (descr.); GUIGNOT, 1956g:57 (descr., faun.).

Hydroporus fuscobrunneus CLARK, VAZIRANI, 1977a:26 (disc., faun.). **New synonym.**

Hydrovatus (Oxynoptilus) ferrugatus RÉGIMBART, 1877:LXXIX (orig. descr., faun.); SHARP, 1882a:814 (descr., faun.); BRANDEN, 1885:26 (faun.); RÉGIMBART, 1888:612 (faun.); SEVERIN, 1890:CXC (disc., faun.); RÉGIMBART, 1899b:232 (descr., faun.); ZIMMERMANN, 1919:126 (faun.); 1920a:33 (faun., list.); 1927:19 (descr., faun.); GUIGNOT, 1954g:565 (descr., faun.); 1956g:55 (faun.); VAZIRANI, 1970b:104 (descr., faun.); ROCCHI, 1976:179 (faun.); VAZIRANI, 1977a:27 (faun.); 1977b:43 (faun.); BRANCUCCI, 1979:196 (descr., faun.);

WEWALKA, 1982:116, 123 (faun. biol.); ROCCHI, 1986a:33 (faun.); NAKANE, 1990a:198 (disc.). **New synonym.**

Hydrovatus elevatus SHARP, 1882a:328 (orig. descr., faun.); BRANDEN, 1885:26 (faun.); RÉGIMBART, 1888:612 (syn. *H. ferrugatus* RÉGIMBART); SHARP, 1890:343 (descr., disc., faun.); SEVERIN, 1890:CXC (list.); RÉGIMBART, 1899b:232 (list.); ZIMMERMANN, 1919:126 (list.); 1920a:33 (list.); 1927:20 (list.); VAZIRANI, 1970b:104 (list., faun.); 1977a:27 (list.); WEWALKA, 1982:116 (list.).

New synonym.

H. orientalis SHARP, 1882a:805 (orig. descr., faun.); BRANDEN, 1885:26 (faun.); ZIMMERMANN, 1920a:32 (syn. list.); WINKLER, 1924:218 (list.); ZIMMERMANN, 1927:20 (list.); 1930:30 (list.); FENG, 1932:21 (list.); WU, 1937:203 (list.); VAZIRANI, 1977a:26 (list.). The species is by SHARP, (1882a) referred to CLARK, (1863:423). The text in Sharp's description is exactly the same as for *Hydroporus carbonarius* on page 423 in CLARK (1863), so it seems obvious that Sharp has exchanged the two names. **New synonym.**

Hydrovatus javanus CSIKI, 1938:126 (orig. descr., faun.); VAZIRANI, 1977a:28 (faun. biol.). **New synonym.**

Type locality: Burma.

Type material studied: *H. subrotundatus*: Holotype, f: *Hydrovatus subrotundatus* Motsch. Ind. or. Birma (ZMM). – *H. carbonarius*: Holotype, f: China 2056/Type/*H. carbonarius* Clark China (BMNH). – *H. c.* var. *fuscobrunneus*: Lectotype, m, by present designation: Java/Bowring/*Hydrovatus carbonarius* ab. *fuscobrunneus* Zim. J. Balfour-Browne det. IV. 1961/*Hydrovatus carbonarius* Clk. J. Balfour-Browne det. (BMNH). – *H. ferrugatus*: Holotype, f: Manille Baer/Determin P. Régimbart/Museum Paris coll. Maurice Régimbart 1908/Type/*Hydrovatus ferrugatus* Rég. (MNHN). – *H. elevatus*: Lectotype, m, by present designation: Celebes Macassar I. 74 O. Beccari/typus/*elevatus* Sharp/*H. elevatus* Sharp Typus!/*H. elevatus* Sharp teste D. Sharp (MCG). – Paralectotypes: Principally with the same data as lectotype (1 ex. BMNH, 1 ex. MCG). One additional specimen was mailed to me from BMNH as belonging to the type material of *H. elevatus*. However, there is no doubt that it has been incorrectly placed in BMNH, because according to the original description and the differing morphology of the specimen, it belongs in fact to the type material of *H. acutus* Sharp (= *H. obtusus* Motschulsky). The type material of *H. elevatus* consists of three specimens, all of which have thus been located. I have decided to choose the single male specimen (in MCG) in the type material as the lectotype to facilitate future identification of the species. – *H. orientalis*: Type material the same as for *H. carbonarius* Clark; see above. – *H. javanus*: Holotype, m: Java Buitenzorg D. Limnol. Exp. 29.X.1928 Bot. Garden Teiche im Palmenquartier/Holotypus 1937 *Hydrovatus javanus* Csiki/Typus *H. javanus* 1937 Csiki/Coll. E. Csiki (TMB). – Paratype: Same sampling data as holotype except: Bellevue, Lampe IX.1928 (1 ex. TMB).

Additional material studied: India: Kaziranga 75 m, 7–9.V.1976/Assam (7 exx. coll. Brancucci); Sonapur Mahanhandra Riv. 9–15.IX.1984/Darjeeling D. (8 exx. coll. Brancucci, 2 exx. MZH); S. Andaman 22.XII.1976 Bimblton, Lichtfangen Bade/*H. ferrugatus* Régb. det. Wewalka (1 ex. coll. Brancucci). – Bangla Desh: E Pakistan, Dinjapur X.1970 (1 ex. coll. Brancucci). – Nepal: Kathmandu 18–27.IX.1979 (1 ex. coll. Brancucci); Phulvari–Waku 1200–1600 m 9.VI.1985/Koshi (1 ex. coll. Brancucci). – Burma: Rangoon 6.XI.1984/*H. ferrugatus* Rgb. det. Rocchi 1985 (1 ex. coll. Rocchi).

– Thailand: Chiaugurai 11.VI.1965/at light (6 exx. BBM, 1 ex. MZH); Chiaugurai 300 m, MV light 14.XI.1957 (9 exx. BBM, 3 exx. MZH); Chiaugurai 300 m, light 14.XI.1957 (1 ex. BBM); Kanchanaburi am licht 26., 30.XI., 1.XII.1990 (2 exx. NMW, 1 ex. MZH); ca. 220 km NW Bangkok, 110 m, IX.1990 (7 exx. MNB, 2 exx. MZH); Tap Tan 20 km WNW Uthai Thani 250 km NW Bangkok (1 ex. coll. Brancucci); Chom Thong 24–27.IV.1991, 18.26N, 98.41 E (43 exx. coll. Brancucci, 6 exx. MZH); Chom Thong 23–27.IV.1991 (3 exx. coll. Brancucci); Umphang 500 m, 16.04N, 98.53E, 26.IV.–6.V.1991 (58 exx. coll. Brancucci, 6 exx. MZH); Chiang Dao 600 m, 19.24N, 98.55E, 10–16.V.1991 (5 exx. coll. Brancucci); Fang 300 m, 19.55N, 99.12E, 25.V.1991 (17 exx. coll. Brancucci, 2 exx. MZH); Palong 750 m, 19.55N, 99.06E, 26–28.V.1991 (3 exx. coll. Brancucci); Mae Hong Son 30.IV.1992, 350 m (1 ex. coll. Brancucci). – Laos: Vientiane pr. Gi Sion Vill., da Tha Ngone 28.II.1965/light trap (5 exx. BBM, 2 exx. MZH); Vientiane pr. Ban Van Eue 30.II.1965/Malaise trap (3 exx. BBM); Vientiane, light trap 2–4.VI.1960 (1 ex. BBM); Luang Prabang 300 m, 4–5.VI.1960/light trap (5 exx. BBM, 3 exx. MZH). – Vietnam: Tuong linh nr Phu ly 24–28.V.1966/lamp (2 exx. coll. Brancucci); Cue Phuong Ninh binh 3–10.V.1966/coll. lamp (1 ex. coll. Brancucci); Hoa Binh 4–7.VI.1986 Ha Son Binh pr. (3 exx. coll. Brancucci); Hoa Binh 6–9.VI.1986 (2 exx. coll. Brancucci); Yen Bai Pr. Hoang Lien son V.1990 (3 exx. coll. Brancucci, 1 ex. MZH); Yen Bai 10.V.1990 (1 ex. coll. Brancucci); Di Linh (Djiring) 920 m 22–28.IV.1960 (2 exx. BBM); Tonkin Central (2 exx. coll. Brancucci). – Indonesia: Sumatra: Dolok-Merungir 1.X.–14.XI.1980 (4 exx. MNB, 2 exx. MZH); Ft. de Kock 920 m, 1926/*H. ferrugatus* Régb. det. Zimmermann (1 ex. NMW, 1 ex. MNB); W Sumatra Lemba–Harau 15 km NE Payakumbu 11.II.1991 (2 exx. NMW); N Sumatra Toba See, ca. 900 m, Samosir 3.II.1990 (1 ex. NMW); S Nias Umg. Telukdalam 12.II.1990 (1 ex. NMW); same but 8.II.1990 (1 ex. NMW, 1 ex. MZH); S Nias Oyo Fl. ca. 70 km N Telukdalam 13.II.1990 (1 ex. NMW); S Nias 40 km N Telukdalam 13.II.1990 (1 ex. NMW); Java: Batoe (1 ex. MNB); Buttenzorg Croisiere ou Nirvana 11.IV.1908 (1 ex. coll. Brancucci); Probolinggo/*H. ferrugatus* det. Gschwendtner (1 ex. coll. Brancucci); Bali: Ubud ca. 300 m, Reisfeld 26.VIII.1990 (1 ex. coll. Balke & Hendrich); Lombok Suranadi 3.II.1988 (1 ex. NMW). – Philippines: Same data as holotype of *H. ferrugatus* Régb. (7 exx. MNHN, possibly type material); Manille (1 ex. MNHN); Manila 2.XI.1914 (28 exx. MNB, 3 exx. MZH); Manila X.1913 (1 ex. MNB); Manila lux (33 exx. MNB, 3 exx. MZH); Mindanao Siocon X.1974 (1 ex. coll. Rocchi); Luzon (7 exx. MNB, 1 ex. MZH); Luzon I.1914 (1 ex. MNB); S. Luzon Pr. Laguna Pagsanjan (2 exx. MNB); Aroroy (Ins. Masbate) (1 ex. MNB); Los Banos (1 ex. MNB); Mindanao Misamis occ. Ozamis City 22.X.1959 (1 ex. BBM, 1 ex. MZH); Mindanao Zamboanga del Sur Zamboanga 29.VII.1958 (1 ex. BBM); Zamboanga del Sur Zamboanga 30.VII.1958/light trap (1 ex. BBM); Culion Isl. 6 km W Culion 13.VI.1962 (1 ex. BBM); same as preceding except 6., 7.VI.1962 (2 exx. BBM); 200 m SW Panay 8 km E Bontol 10–11.XII.1990 (11 exx. coll. Brancucci, 2 exx. MZH). In all, 365 exx.

Diagnosis: A quite widely distributed species, which is quite easy to determine by one peculiar external character: the lateral margin between the elytra and epipleura is clearly visible from above. Also the comparatively short narrow apex of the penis is a useful feature in distinguishing *H. subrotundatus*.

Length of body: 2.28–2.88 mm, breadth: 1.58–1.88 mm. Body quite broad (Fig. 57).

Head: Pale ferrugineous to dark ferrugineous. Finely and particularly posteriorly sparsely punctate. In wide frontal depressions and at eyes with somewhat denser punctures. Submat to rather shiny, distinctly microsculptured, except posteriorly where microsculpture very fine. Head frontally rounded, medially often somewhat straightened, from eye to eye finely margined (Fig. 58). Antenna pale ferrugineous, rather slender, not distinctly modified (Fig. 59).

Pronotum: Pale ferrugineous to dark ferrugineous. Medially darkest, laterally palest. Mediobasally often, and anteriorly rarely with narrow darkened area. Rather finely and densely punctate. Discally on each side generally with an impunctate narrow area. Rather shiny, although microsculptured (meshes distinct). Sides of pronotum rounded to almost straight.

Elytra: Blackish to pale ferrugineous, laterally palest. Without distinct colour pattern. Rather finely and quite densely punctate. Apically punctures indistinct. Lateral row of punctures indistinctly discernible (indicated by rather few punctures). Indistinct discal row of punctures rarely visible. Dorsolateral row of punctures absent. Quite distinct variation in density and size of elytral punctures



Figs 57–62: *Hydrovatus subrotundatus*. – 57, habitus. – 58, head, frontal aspect. – 59, antenna. – 60, penis, dorsal aspect. – 61, penis, lateral aspect. – 62, paramere. Left bottom scale 1 mm, habitus; left top scale 0.5 mm, head and antenna; right scale 0.4 mm, genitalia.

exhibited. Rather shiny, although quite finely microsculptured. Epi-pleura dark to pale ferrugineous, finely punctate (densest at inner half), quite shiny and indistinctly microsculptured.

Ventral side: Dark to pale ferrugineous. Fairly coarsely to rather finely and densely to rather sparsely punctate. Abdomen, except basally (with fine punctures), almost impunctate. Rather shiny, without distinct microsculpture. Abdomen slightly mat, finely microsculptured. Prosternal process laterally finely margined, medially almost flat to slightly convex and distinctly punctate.

Legs: Pale ferrugineous to ferrugineous to pale brown. Pro- and mesotarsus slightly enlarged.

Male genitalia: Figs 60–62.

Female: Externally very similar to male.

Distribution: China (exact location unknown, in map placed in South China), India, Bangla Desh, Nepal, Burma, Thailand, Laos, Vietnam, Indonesia: Sumatra, Java, Celebes, Bali, Lombok, Philippines (Fig. 56). Additional literature records are: *H. carbonarius* from Borneo (RÉGIMBART, 1899b), from Sri Lanka (ZIMMERMANN, 1927) and southern New Guinea (RÉGIMBART, 1899b).

Biology: Insufficiently known. Often collected with different kinds of light traps (eg. MV light). WEWALKA (1982) reports that the species was sampled by light in Andaman Islands near a brook and a ricefield. In northern Sumatra sampled at an altitude of ca. 900 m a.s.l.

Synonymy: Holotypes and lectotypes of all taxa involved (see under type material studied) have been examined and compared. Although the material studied exhibits some morphological variation, it agrees well in regards to some key characters (see under diagnosis). Therefore I believe they all belong to one species, the valid name of which is *H. subrotundatus* Motschulsky (oldest available name).

Hydrovatus davidis Young

Figs 63–68, 75.

Hydrovatus davidis YOUNG, 1956:53 (orig. descr., faun.).

Type locality: St. Davids, Arizona, USA.

Type material studied: Holotype, m: Ariz.: St. Davids 17.VII.1945 G.E. Pickford/small shallow pool/type/*H. davidis* Type! J. Balfour-Browne det./N. America Arizona St. Davids B. M. 1948–22 (BMNH). – Paratypes: Principally with same data as holotype, but labelled as paratypes (16 exx. BMNH, 3 exx. CAS).

Additional material studied: USA: California: Waltham Cr. 6.5 mi. W Coalinga, Fresno Co. 29.VIII.1952/*H. brevipes* ? Sharp. det. H. B. Leech (4 exx. CAS, 1 ex. MZH); Calif., Sequoia Nat'l Park, alt. 2000–5000 ft/16.VII.1931 (7 exx. CAS, 1 ex. MZH); Calif. Madera Co., Windy Gap 13.VII.1946 (1 ex. CAS); Calif. Inyo Co., Bishop 21.VI.1929 (1 ex. CAS); Calif. Merced 15.V.1934 (1 ex. CAS); Calif. San Joaquin Co., nr. Lodi 20.IV.1931 (1 ex. CAS); Arizona: Cochise Co. St. David, fish pond 27.VII.1961 (1 ex. CAS); NM: Hidalgo Co. S. Bernardino Valley 3.VII.1976 (1 ex. MZH); NM, Hidalgo Co. Double Adone site, Day Ranch 32 mi. S Animas/stock ponds 31.VII.1965 (1 ex. CAS); Am. Nord/*H. cuspidatus* Germ. (1 ex. MNHN, 1 ex. MZH). – Mexico: Tamaulipas Ocampo 24.II.1963 (1 ex. CAS); Sinaloa Culiacan 10 mi. N, 1.VIII.1962 (1 ex. CAS); Vera Cruz, betw. Nautla and Palma Sola 10.VI.1971 (1 ex. CAS, 1 ex. MZH); Vera Cruz, Acayucan, 20 mi. S, 7.IX.1964 (1 ex. CAS); Vera Cruz, pools ca. 9.2 mi. W Tampico 24.VIII.1954 (1 ex. MZH). In all, 48 exx.

Diagnosis: The taxonomic status of *H. davidis* is unclear. Although I have studied many specimens belonging to the species complex *H. davidis*–*H. caraibus*–*H. sharpi*, I have as yet no acceptable picture of how these species are separated from each other. Intermediates occur frequently, and possibly it is a question of one highly variable species. This complex needs further study. Typical representatives of *H. davidis* are characterized by quite distinct dorsal colour pattern, by comparatively coarser elytral punctation, and by shallow but discernible lateral furrows of elytra. For separation of other American *Hydrovatus* species details of the male genitalia require study.

Length of body: 2.15–2.60 mm, breadth: 1.46–1.62 mm. Habitus (Fig. 63).

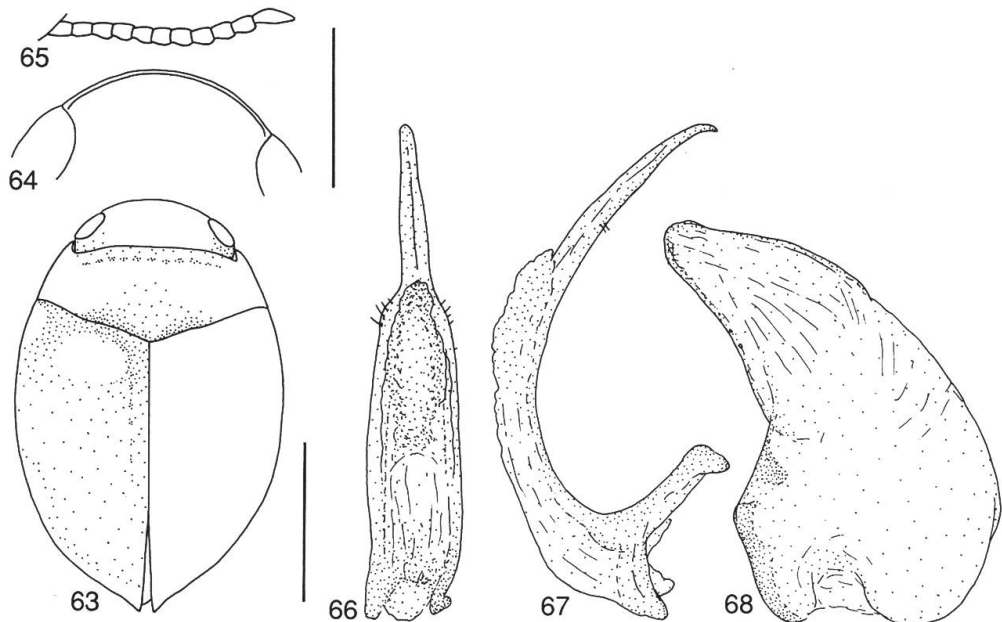
Head: Pale ferrugineous, posteriorly often slightly darker, ferrugineous to brownish. Punctation fine to very fine, sparse, irregularly distributed and densest at eyes and in shallow frontal depressions. Rather shiny, microsculptured (meshes distinct). Head frontally rounded, from eye to eye narrowly margined (Fig. 64). Antenna pale ferrugineous, rather slender, not distinctly modified (Fig. 65).

Pronotum: Pale ferrugineous, mediobasally and anteriorly with slightly darkened, vague areas (Fig. 63). Finely to very finely, quite sparsely and irregularly punctate. Punctures densest basally and frontally. Rather shiny, microsculptured (meshes quite distinct). Sides of pronotum slightly rounded.

Elytra: Dark ferrugineous to brownish, often with variable fairly distinct to vague colour pattern (Fig. 63). Punctation fairly coarse and quite dense. Apically punctures distinctly finer. Discal row of punctures basally discernible but rather indistinct. Dorsolateral row

of punctures absent. Lateral row of punctures rather indistinct, mixed with adjacent punctures. Rather shiny, microsculptured (meshes laterally sometimes partly indistinct). Epipleura pale ferruginous, quite coarsely punctate, rather shiny, finely microsculptured.

Ventral side: Brownish to dark ferruginous. Abdomen often distinctly paler, pale ferruginous. Fairly coarsely to coarsely punctate. Abdomen except for base almost impunctate. Shiny, almost without microsculpture. Abdomen slightly mat, finely microsculptured. Prosternal process laterally finely margined, medial surface flat, rather finely punctate.



Figs 63–68: *Hydrovatus davidis*. – 63, habitus. – 64, head, frontal aspect. – 65, antenna. – 66, penis, dorsal aspect. – 67, penis, lateral aspect. – 68, paramere. Left bottom scale 1 mm, habitus; left top scale 0.5 mm, antenna and head; right scale 0.4 mm, genitalia.

Legs: Pale ferruginous to ferruginous. Pro- and mesotarsi slightly enlarged.

Male genitalia: Fig. 66–68.

Female: Externally as male.

Distribution: USA: California, Arizona, New Mexico, Mexico (Fig. 75). YOUNG (1956) in the original description of the species also gives Texas.

Biology: Practically nothing is known of the living habits of the species. In Arizona sampled in a small shallow pool and a fish pond. In California the species was collected at an altitude between 2000–5000 ft.

Hydrovatus caraibus Sharp

Figs 69–75.

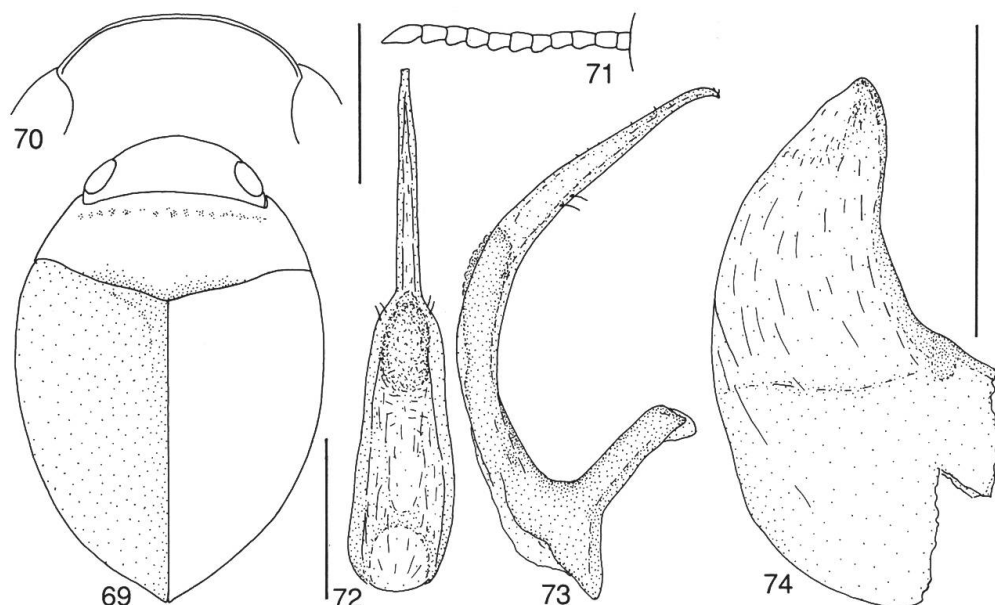
Hydrovatus caraibus SHARP, 1882a:325 (orig. descr., faun.); BRANDEN, 1885:25 (faun.); ZIMMERMANN, 1920a:32 (faun.); BLACKWELDER, 1944:75 (faun.); SPANGLER, 1981:151 (disc.).

Type locality: Guadalupe.

Type material studied: Holotype, f. ? *Hydrovatus caraibus* Type D.S. Goudeoupe. Wehncke/Type/1177/Sharp Coll. 1905–313 (BMNH).

Additional material studied: Cuba: Cuba/Hist. Coll. 10065 (1 ex. MNB). – Jamaica: St. Cath. Parish–Spanish Twn BLT 15.VII.1970 (1 ex. MZH). – Dominican Republic: Santo Domingo 30 m, 22.I.1973 (1 ex. coll. Young). – Puerto Rico (USA): Porto Rico/Hist. Coll. 10065 (1 ex. MNB); Porto Rico (1 ex. MNB). – Guadalupe: Guadeloupe (3 exx. MNHN). – Location unknown: Hist. Coll. (1 ex. MNB). – Material of uncertain determination: Colombia: Magdalena Isla Salamanca Parc Nat. 80 km W Sta Marta 23.II.1968 (2 exx. MZH). – Venezuela: Eco. Mirando Higuerote, Barlovento 28.I.1962 (1 ex. MZH); Guarico Camaquan 18.IV.1965 (1 ex. coll. Rocchi). – Guyana: Georgetown Aq. Col., Bot. Garden 28.VIII.1959/in ditches (1 ex. BMNH). – Brazil: Nova Teutonia 1.X.1951, 27,11/52,23, 300–500 m (1 ex. coll. Young). – Paraguay: Caacupe Dept. Cordillera 16.IX.1981 (1 ex. coll. Young). In all, 17 exx.

Diagnosis: See diagnosis of *H. davidis* above. Typical specimens of *H. caraibus* have a bigger and slightly broader body than do typical specimens of *H. davidis*. Elytra of *H. caraibus* always without distinct colour pattern. Specimens from the South American mainland are a little smaller (min. length 2.20 mm) than specimens from the West



Figs 69–74: *Hydrovatus caraibus*. – 69, habitus. – 70, head, frontal aspect. – 71, antenna. – 72, penis, dorsal aspect. – 73, penis, lateral aspect. – 74, paramere. Left bottom scale 1 mm, habitus; left top scale 0.5 mm, head and antenna; right scale 0.4 mm, genitalia.

Indies. Their placement in *H. caraibus* is regarded as unclear. *H. caraibus* is sometimes also difficult to distinguish from *H. pustulatus* (specimens with vague elytral colour pattern). A part of the American *Hydrovatus* undoubtedly needs further research.

Description: only differences from the description of *H. davidis* noted.

Length of body: 2.50–2.64 mm, breadth: 1.64–1.78 mm (including South American material min. length 2.20 mm, min. breadth 1.56 mm). Body quite globular (Fig. 69).

Head: Pale ferruginous to ferruginous (quite unicoloured). Punctuation almost absent, very fine, sparse, partly absent. Rather shiny, very finely and rather indistinctly microsculptured. Frontal aspect of head (Fig. 70). Antenna (Fig. 71).

Pronotum: Rather shiny, very finely and indistinctly microsculptured.

Elytra: Blackish ferruginous to dark ferruginous to ferruginous. Palest laterally and apically, but without distinct colour pattern. Rows of punctures practically absent. Discal and lateral rows of punctures sometimes weakly discernible among ordinary punctuation. Rather shiny, very finely and partly indistinctly microsculptured.

Male genitalia: Figs 72–74.

Female: Externally approximately as male. Sometimes (specimen from Jamaica) body dorsally mat, distinctly microsculptured.

Distribution: Cuba, Jamaica, Dominican Republic, Puerto Rico (USA), Guadeloupe (Fig. 75). Uncertain records are Colombia, Venezuela, Guyana, Brazil and Paraguay. In map marked with? except records from Brazil and Paraguay, which are excluded.

Biology: Practically unknown.

Hydrovatus sharpi Van den Branden

Figs 75–81.

Hydrovatus obscurus SHARP, 1882b:15 (orig. descr., faun.); BRANDEN, 1885:27 (new name); SHARP, 1887:751 (faun.); ZIMMERMANN, 1919:127 (disc.); 1920a:35 (syn. list.); Blackwelder, 1944:75 (syn. list.).

Hydrovatus sharpi VAN DEN BRANDEN, 1885:27 (nom. nov. for *H. obscurus* Sharp, preoccupied by *H. obscurus* Motschulsky, 1859 = *H. acuminatus* MOTSCHULSKY, 1859); ZIMMERMANN, 1919:127 (disc.); 1920a:35 (faun.); BLACKWELDER, 1944:75 (faun.).

Type locality: Paso Antonio, Guatemala.

Type material studied: Lectotype, m, by present designation (mounted between two other specimens on same card): *Hydrovatus obscurus* D.S. Paso Antonio 400 ft. Guatemala Champion/cotype/Paso Antonio 400 ft. Champion/Sharp Coll. 1905–313/

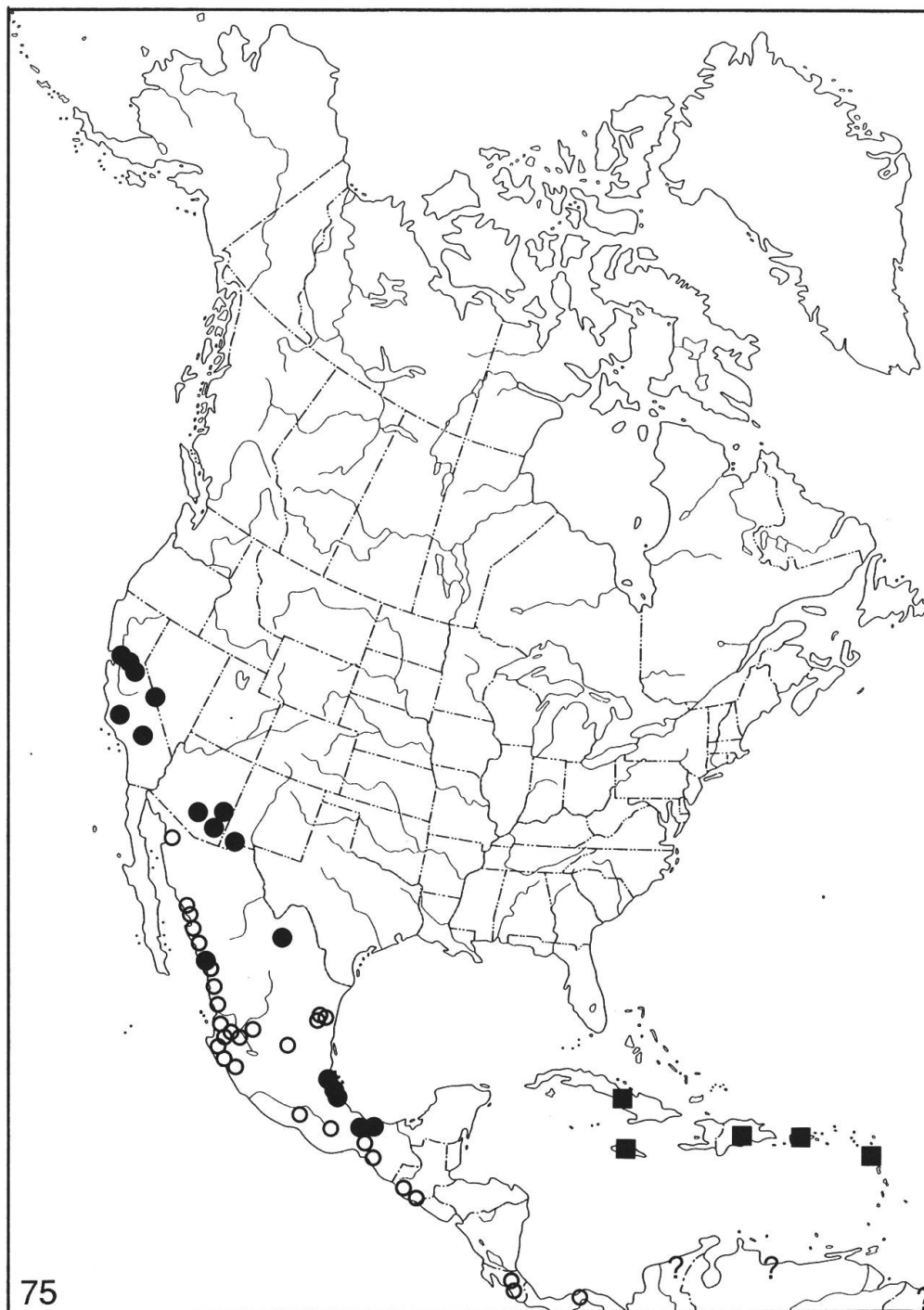


Fig. 75: Distribution of *Hydrovatus davidis* (dot), *H. caraibus* (square, ?) and *H. sharpi* (circle).

B.C.A. Col. I. 2. *Hydrovatus obscurus* Sharp (BMNH). – Paralectotypes: On same card as lectotype (2 exx. BMNH); same data as lectotype, but labelled as type (1 ex. BMNH). No lectotype has thus far been designated, and because the single specimen provided with a type label is female, I chose a male among the specimens labelled as cotypes.

Additional material studied: Mexico: Morelos, 14 mi. S Cuernavaca 8.XII.1948 (14 exx. CAS, 5 exx. MZH); the same and an addition: Mineralized Sulphur stream (1 ex. CAS); Morelos V. Aranda 1.XI.1983 (2 exx. MZH); Tepic Nayarit 21–24.IX.1953 (4 exx. CAS, 1 ex. MZH); same but 15–17.IX. (2 exx. CAS); same but 24.IX. (1 ex. CAS); 25 km S Tepic 24.IX.1953 (1 ex. CAS); Nayarit 25 mi. SE Tepic 23.I.1948 (1 ex. CAS); San Blas Nayarit 17–21.IX.1953 (2 exx. CAS); San Blas 5 mi. E 31.VII.1962 (1 ex. CAS); Sinaloa Mazatlan 7 mi. S 11.XII.1962 (5 exx. CAS, 1 ex. MZH); Sinaloa Escuinapa 5–15 mi. SW, coastal plain 4.IV.1974 (2 exx. CAS); Sinaloa Aquaverde, stream at edge of town of coastal plain 10.IV.1975 (3 exx. CAS); Sinaloa Culican 10 mi. N, 1.VIII.1962 (1 ex. CAS); Morelos Puente de Ixtla 29.VIII.1962 (1 ex. CAS); S.L. Potosi Antiquo Morelos 23.III.1963 (2 exx. CAS); S.L. Potosi Ciudad del Maiz 9.I.1971 (1 ex. CAS); Oaxaca Mutias Romero 5 mi S, 7.IX.1964 (3 exx. CAS); Oaxaca Tapanatepec 1.IX.1963 (5 exx. CAS, 1 ex. MZH); Jalisco Barra de Navidad 23.III.1971 (1 ex. CAS); Colima, clear stream 7 mi. NE Colima 3.XII.1948 (1 ex. CAS); Sinaloa, La Higuera, 7.8 mi. NW Rosario, river pool 10.IV.1975 (3 exx. CAS); Jalisco 15 mi. NE Atenquique 5.XII.1948 (1 ex. CAS); Nayarit, pond 20.5 mi NW of Tepic 24.XI.1948 (3 exx. CAS); Nayarit, 15 mi SE of Tepic 28.XI.1948 (1 ex. CAS); Sonora Hermosillo 9–16.VII.1953 (2 exx. CAS); CTO Irapuato, 5mi. S 27.VII.1962 (1 ex. CAS); 8 mi. S Guadalajara, Jalisco XI.1954 (1 ex. CAS); Sin. Espinol 26.IX.1953 (1 ex. CAS); SLP, weedy pond, 15 mi. E Cid. d. Maiz 19.XI.1948 (11 exx. CAS, 3 exx. MZH). – Guatemala: Tiguistate 5.VIII.1943/irrig. ditch, banana plant./*H. sharpi* Br. det. Leech 1944 (1 ex. CAS). – Costa Rica: San Jos (4 exx. MNHN); Turrialba 29.XI.1955 (2 exx. CAS). – Panama (Canal zone): Albrook Forest 1967 (1 ex. MZH). In all, 96 exx.

Diagnosis: See under diagnosis of *H. davidis* above. Typical *H. sharpi* specimens are characterized by a quite globular body, by elytra without a distinct colour pattern, and by the frontal aspect of the head, which is medially generally straightened. General body colour generally paler in *H. sharpi* than in *H. davidis* and *H. caraibus*. Status as a separate species is unclear.

Description: only features deviating from the two previous descriptions are considered.

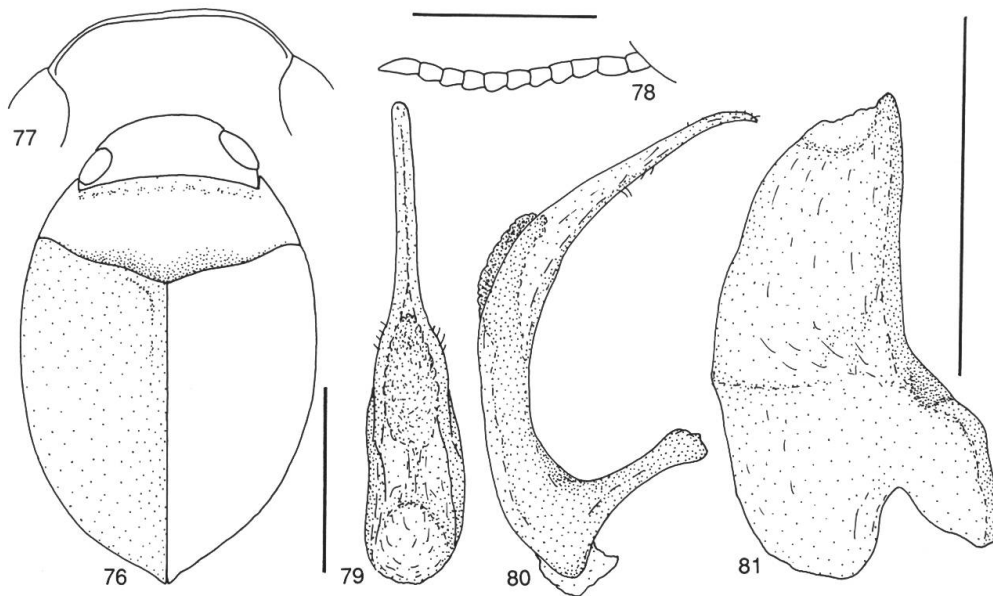
Length of body: 2.22–2.46 mm, breadth: 1.46–1.62 mm. Body fairly globular (Fig. 76). Sometimes body dorsally with quite distinct microsculpture.

Head: Frontally rounded, but often medially distinctly straightened (Fig. 77). Antenna (Fig. 78).

Pronotum: Sides of pronotum quite rounded to almost straight.

Elytra: Size of punctures more variable. Sometimes discal row of punctures basally clearly visible (sometimes even absent). Epipleura with a few rather indistinct punctures concentrated inner part.

Male genitalia: Figs 79–81.



Figs 76–81: *Hydrovatus sharpi*. – 76, habitus. – 77, head, frontal aspect. – 78, antenna. – 79, penis, dorsal aspect. – 80, penis, lateral aspect. – 81, paramere. Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

Distribution: Mexico, Guatemala, Costa Rica, Panama (Canal zone) (Fig. 75).

Biology: Unsufficiently documented. In Mexico it was sampled in a river pool. In Guatemala it was collected from an irrigation ditch on a banana plantation.

Hydrovatus leconteii (Clark)

Figs 82–88.

Hydroporus leconteii CLARK, 1862:175 (orig. descr., faun.); BRANDEN, 1885:26 (faun.); SHARP, 1882b:15 (disc., faun.); ZIMMERMANN, 1920a:34 (faun., list.); BLACKWELDER, 1944:75 (faun.).

Hydrovatus inornatus SHARP, 1882b:15 (orig. descr., faun.); BRANDEN, 1885:26 (faun.); SHARP, 1887:751 (disc., faun.); RÉGIMBART, 1895a:339 (descr., faun.); ZIMMERMANN, 1920a:34 (faun.); BLACKWELDER, 1944:75 (faun.). **New synonym.**

Type locality: Mexico.

Type material studied: *H. leconteii*: Holotype, f: Type H.T./*H. leconteii* Clark Mexico (BMNH). – *H. inornatus*: Holotype, f: *Hydrovatus inornatus* Type D.S. Oaxaca Mexico Hoege/Oaxaca Hoege/Type/Sharp Coll. 1905–313/B.C.A. Col. I.2. *Hydrovatus inornatus* Sharp (BMNH).

Additional material studied: USA: Arizona: Pima Co. Tucson 3.IX.1906/*H. lecontei* Cl. ? det. Young (1 ex. CAS). – Mexico: Mexico City (1 ex. BMNH); 20 mi. W Jiquilpan Jal. 30.XI.1948 (3 exx. CAS, 1 ex. MZH); 15–20 mi. W Jiquilpan 30.XI.1948 (1 ex. CAS); Vera Cruz Coatzacoalcoal, 15 mi, 26.VIII.1962 (1 ex. CAS); 15 mi. E C.d. Maiz, S.L.P. 19.XI.1948 (2 exx. CAS, 1 ex. MZH); Michoacan Morelia 22.VIII.1963 (2 exx. CAS); Michoacan 15 mi. S Carapan 7.XII.1948 (1 ex. CAS); 8 mi.

N Oaxaca 12.XII.1948 (1 ex. CAS); Oaxaca nr. El Tule 6.IX.1964 (2 exx. CAS, 1 ex. MZH); Oaxaca Ejutla, 13 km N, 5.IX.1964 (1 ex. CAS); 9 mi. W Zamora, Mich. 6.XII.1948 (1 ex. CAS). In all, 33 exx.

Diagnosis: Undoubtedly rather close to the species-complex *H. davidis*-*H. caraibus*-*H. sharpi* above. *H. leconteii* is mostly distinguished from those by exhibiting quite a peculiar body shape, a quite dark-coloured head, and very fine to fine and rather sparse elytral punctation. Penis in lateral view is peculiarly bent downwards somewhat anterior to the middle of the penis. Deviating specimens with general body colour pale are rare.

Length of body: 2.56–2.74 mm, breadth: 1.60–1.72 mm. Habitus (Fig. 82).

Head: Dark brown to brown to ferruginous. Punctation very fine, sparse, and indistinct. In rather shallow frontal depressions and narrowly at eyes punctures distinctly denser and somewhat coarser. Slightly mat, finely microsculptured (meshes distinct). Frontally rounded, rather finely margined (Fig. 83). Antenna pale ferruginous, rather slender, not distinctly modified (Fig. 84).

Pronotum: Ferruginous to brownish, anteriorly and posteriorly with vague blackish area. Punctation fine to very fine, rather sparse. Discally on each side with a quite broad, almost impunctate area. Slightly mat, finely microsculptured (meshes distinct). Sides of pronotum almost straight to somewhat rounded.

Elytra: Ferruginous to brownish, basally and along suture frontally with vague darkened area, but definitely without a distinct colour pattern. Punctation fine to very fine, somewhat sparse. Apically and close to epipleura punctation somewhat finer. Discal row of punctures basally discernible, although irregular. Dorsolateral row of punctures absent. Lateral row of punctures also discernible, but irregular and rather indistinct. Slightly mat, finely microsculptured (meshes distinct). Epipleura ferruginous to brownish, quite distinctly punctate and finely reticulate.

Ventral side: Blackish to dark ferruginous. Punctation rather fine to fairly coarse, fairly dense. Abdomen almost impunctate. Basally with fine to very fine punctures. Shiny, almost without microsculpture, abdomen slightly mat, finely microsculptured. Prosternal process laterally distinctly margined, medial surface almost flat, distinctly punctate.

Legs: Dark ferruginous to ferruginous. Pro- and mesotarsi slightly enlarged.

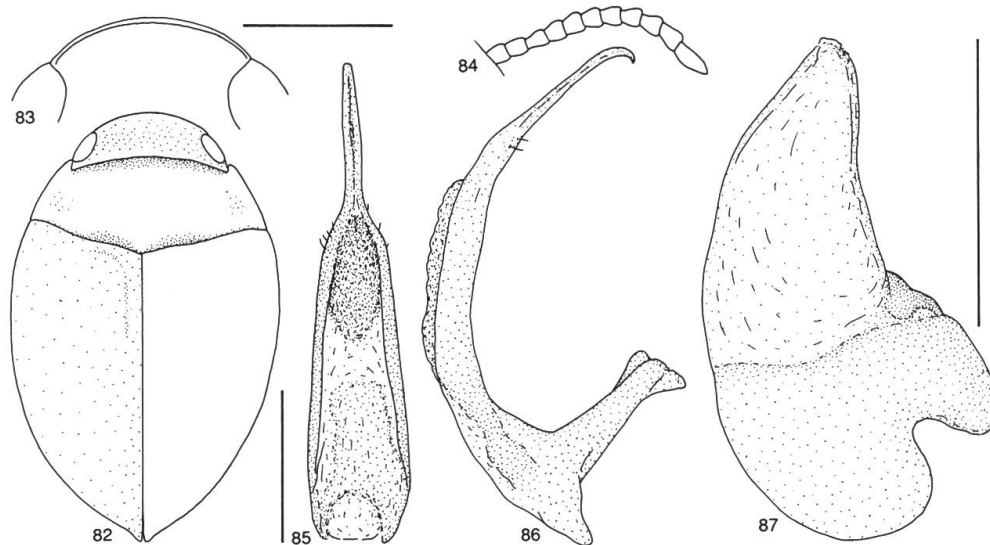
Male genitalia: Figs 85–87.

Female: Externally approximately as male.

Distribution: USA: Arizona, Mexico (Fig. 88).

Biology: Unknown.

Synonymy: Although they are females, I consider the holotypes of *H. leconteii* and *H. inornatus* as belonging to the same species. Thus the name *H. leconteii*, being older, is the valid name for the species.



Figs 82–87: *Hydrovatus leconteii*. – 82, habitus. – 83, head, frontal aspect. – 84, antenna. – 85, penis, dorsal aspect. – 86, penis, lateral aspect. – 87, paramere. Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

Hydrovatus brevipes Sharp

Figs 88–95.

Hydrovatus brevipes SHARP, 1882a:324 (orig. descr., faun.); BRANDEN, 1885:25 (faun.); SHARP, 1887:15 (disc.); Leng, 1920:77 (faun.); ZIMMERMANN, 1920a:32 (faun., list); YOUNG, 1956:53 (disc.); ANDERSON, 1962:57 (faun.); 1985:13 (faun., biol.).

Type locality: California, USA.

Type material studied: Lectotype, m, by present designation: *Hydrovatus brevipes* m Type D.S./Type/N. America/Sharp Coll. 1905–313/North America/Type 148 *Hydrovatus brevipes* (BMNH).

Additional material studied: USA: California: Riverside (5 exx. CAS); Laguna 9. IX. (6 exx. CAS); Sea Sh./Laguna (7 exx. CAS); San Joaquin Hills (1 ex. CAS); Inyo Co., freshwater, Gromshaw Lake, Tecopa, alt. 1320 ft. 22. III. 1967 (5 exx. CAS, 3 exx. MZH); San Diego Co., San Felipe cr. at Scissors Cross. 15. IV. 1965 (4 exx. CAS, 2 exx. MZH); Salton S./Imperial Co. VI. 1936 (1 ex. CAS); Modoc Co. Menlo Baths, 4 mi. SE Eagleville 28. VIII. 1966, alt. 4550 ft. (40 exx. CAS, 10 exx. MZH); Utah, St.

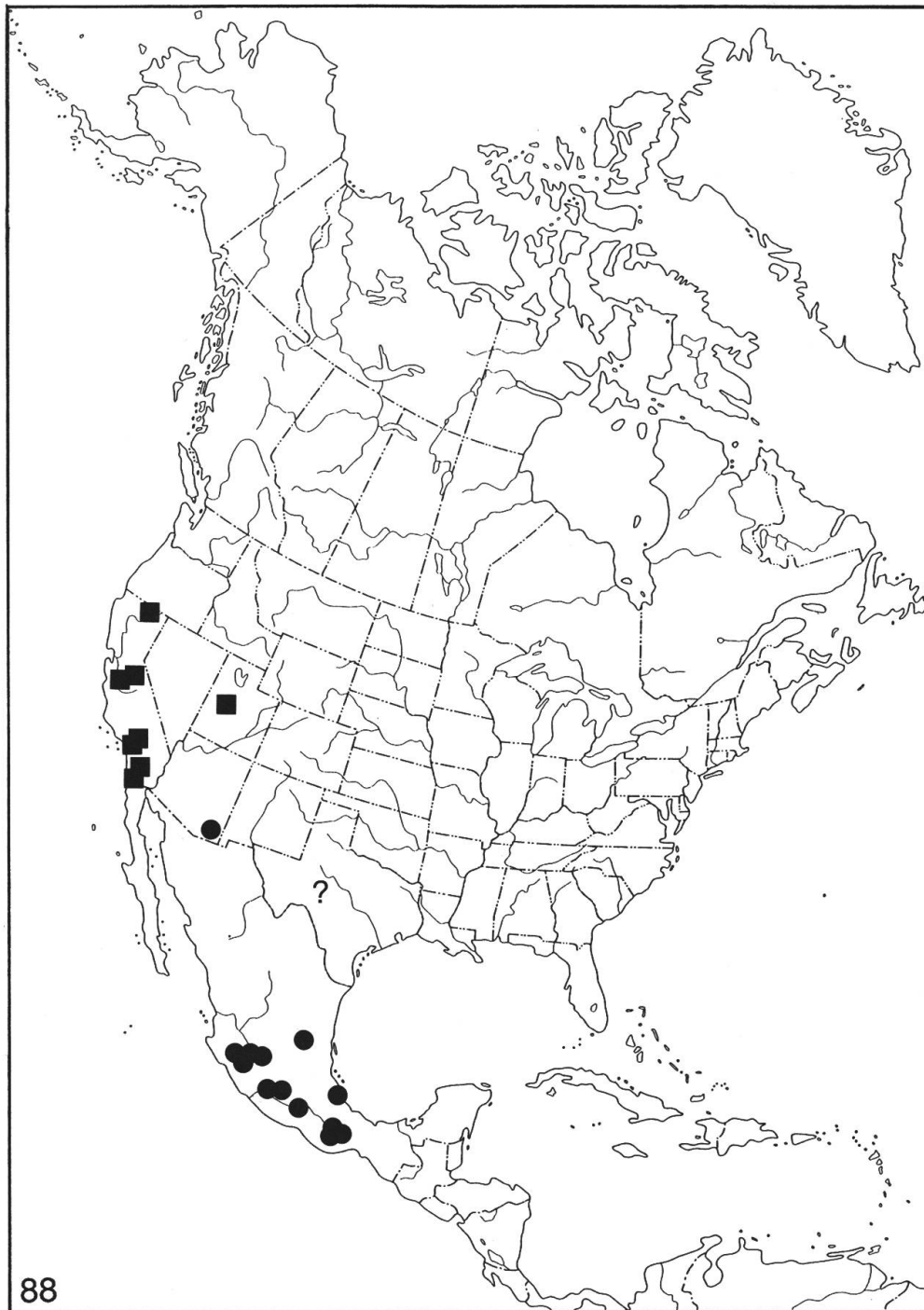


Fig. 88: Distribution of *Hydrovatus leconteii* (dot) and *H. brevipes* (square, ?).

George/12. VII. 1940 (1 ex. CAS). Uncertain records are Texas: Roosevelt 21. IV. 1924 (5 exx. CAS); Tex. 14 mi. SW Junction, Kimble Co. 11. VII. 1954 (2 exx. CAS). In all, 88 exx.

Diagnosis: Also quite closely related to the species complex *H. davidis*-*H. sharpi*, typical *H. brevipes* specimens are characterized by

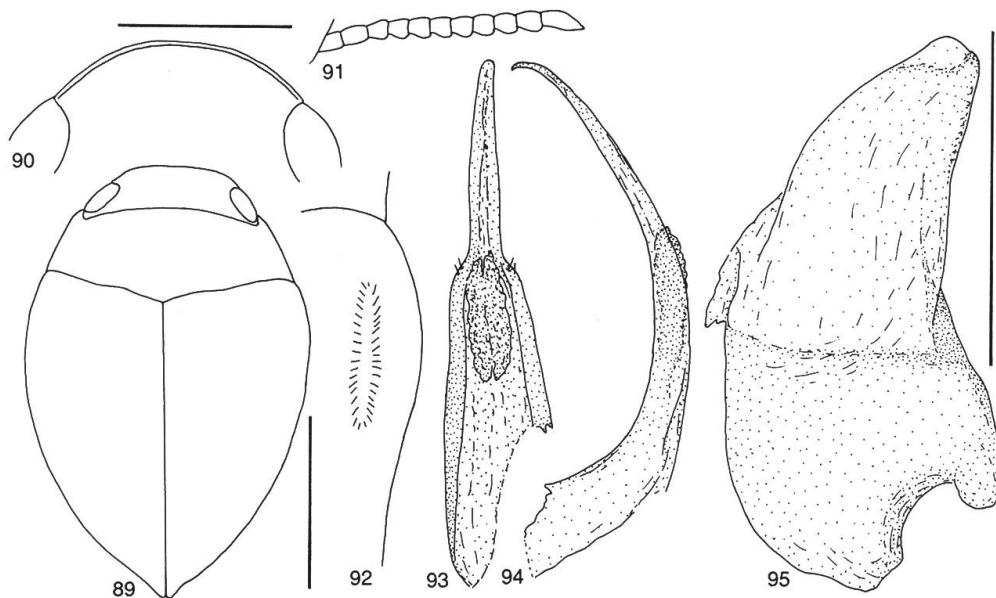
a dark-coloured body, by distinct lateral grooves on elytra, and by a broad, posteriorly peculiarly narrowing body. Unfortunately the elytral groove is variable in shape (sometimes shallow), which makes identification often difficult.

Length of body: 2.22–2.60 mm, breadth: 1.48–1.76 mm. Habitus (Fig. 89). Specimens from Texas differ predominantly in having general body colour distinctly paler.

Head: Dark ferrugineous to ferrugineous, with a few fine to very fine, sparse punctures (punctuation partly absent). In frontal rather shallow but wide depressions and narrowly at eyes with somewhat denser punctures. Slightly mat, microsculptured (meshes distinct). Head frontally rounded, finely margined (Fig. 90). Antenna pale ferrugineous, rather slender (Fig. 91).

Pronotum: Blackish ferrugineous to dark ferrugineous, laterally with slightly paler vague areas. Punctuation fine to very fine, rather sparse. At margins punctures distinctly denser. Slightly mat, finely microsculptured (meshes distinct). Sides of pronotum almost straight to somewhat rounded.

Elytra: Blackish to dark ferrugineous to ferrugineous, generally without colour pattern. Rarely very vague paler areas may be discerned. Punctuation rather fine to fairly coarse, sparse to rather sparse,



Figs 89–95: *Hydrovatus brevipes*. – 89, habitus. – 90, head, frontal aspect. – 91, antenna. – 92, lateral elytral furrow. – 93, penis, dorsal aspect (basally broken). – 94, penis, lateral aspect. – 95, paramere. Horizontal scale 0.5 mm, head, antenna, elytral furrow; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

somewhat irregularly distributed. In general elytral punctures variable in size. Distinct rows of punctures absent. Slightly mat, finely microsculptured (meshes distinct). Elytra laterally in general with a distinct groove (Fig. 92), which is sometimes quite shallow. Epipleura dark ferrugineous, with punctation concentrated in inner part and finely microsculptured.

Ventral side: Blackish to dark ferrugineous. Punctation rather fine to fairly coarse, rather sparse. Abdomen, except basally, almost impunctate. Shiny, almost without microsculpture. Abdomen finely reticulated. Prosternal process laterally finely margined, medial surface almost flat and rather finely punctate.

Legs: Pale ferrugineous. Pro- and mesotarsi quite broad.

Male genitalia: Figs 93–95.

Female: Elytral microsculpture more strongly developed.

Distribution: USA: California, Utah (Fig. 88). Records from Texas are regarded as uncertain and marked with a ? on the present map.

Biology: Sometimes sampled at quite high altitudes (4550 ft.). ANDERSON (1985), arbitrarily utilizing 6000 feet elevation as the dividing line, lists *H. brevipes* as a valley species, and additionally he reports the species to occur both in lentic and lotic waterbodies.

Hydrovatus pustulatus (Melsheimer) Figs 18, 96–103, 110.

Hygrotus pustulatus MELSHEIMER, 1846:29 (orig. descr., faun.).

Hydroporus pustulatus (MELSHEIMER), SCHAUM, 1868:28 (disc., faun.).

Hydrovatus pustulatus (MELSHEIMER), CROTCH, 1873:387 (disc. syn. *H. cuspidatus*, faun.); SHARP, 1882a:323 (descr., faun.); BRANDEN, 1885:27 (faun.); SEVERIN, 1890:CLXXXIX (disc.); BLATCHLEY, 1910:211 (descr., faun.); LENG, 1920:77 (faun.); ZIMMERMANN, 1920a:35 (faun.); YOUNG, 1953a:114, 115 (disc.); 1953b:21 (disc.); 1954:52 (disc.).

Hydrovatus cuspidatus pustulatus (MELSHEIMER), YOUNG, 1956:54 (descr., disc., faun.); 1960:159, 161 (biol., disc.); 1961:379 (biol. disc.); SPANGLER, 1962:278 (larva descr., faun., biol.).

Hydrovatus pustulatus pustulatus (MELSHEIMER), YOUNG, 1963:184 (disc.); MALCOLM, 1971:19 (descr., disc., faun.); FOLKERTS, 1978:346 (faun.); SWENSON, 1979:477 (faun., biol.); WOLFE & ZIMMERMANN, 1984:376 (descr., disc.); WOLFE, 1985:137 (descr., disc.); WHITE & al., 1985:358 (faun.); STAINES, 1986:118 (faun.); HILSENHOFF, 1987:379 (faun.); WOLFE, 1988:329 (disc.); ALARIE & HARPER, 1990:372 (disc., cited as *H. cuspidatus pustulatus*).

Hydrovatus compressus SHARP, 1882a:324 (orig. descr., faun.); 1882b:15 (disc.); BRANDEN, 1885:25 (faun.); SEVERIN, 1892:472 (list.); LENG, 1920:77 (faun.); ZIMMERMANN, 1920a:32 (faun., list.); YOUNG, 1953b:21, 22 (disc.); 1954:52 (descr., faun., biol.).

Hydrovatus cuspidatus compressus SHARP, YOUNG, 1963:184 (n. comb., disc., faun.).
Hydrovatus pustulatus compressus SHARP, YOUNG, 1963:184 (n. comb., disc., descr., faun.); SPANGLER, 1981:151 (disc., faun., biol.).
Hydrovatus indianensis BLATCHLEY, 1910:212 (orig. descr., faun.); ZIMMERMANN, 1920a:34 (faun., list.); LENG, 1920:77 (faun.); YOUNG, 1953a:114 (descr., faun.); 1953b:21, 22, 23 (disc.); 1956:53 (descr., faun.); MALCOLM, 1971:19 (descr., faun.); WHITE & al., 1985:358 (faun.). **New synonym.**

Type locality: Pennsylvania, USA.

Type material: *H. pustulatus*: Pennsylvania, not located. – *H. compressus*: Lectotype, m, by present designation: 2882/New Orleans Coll. Chevrolat Det. Sharp 82./no. 149/Sharp det. 1882: *Hydrovatus compressus* Shp/R. Mus. Hist. Nat. Belg. Mouchamps ISN). Because the male in ISN has intact genitalia, I have decided to designate it as the lectotype, and not the male in BMNH with penis missing. – Paralectotype: Type/U.S. America/Sharp Coll. 1905–313/New Orleans/*Hydrovatus compressus* n.sp./N. Orleans /Aedeagus lost F.N. Young (1 ex. BMNH). – *H. indianensis*: Holotype, f: Type/Kosciusko Co. Ind. 8–5–64/Purdue Blatchley Collection/Holotype *Hydrovatus indianensis* Blatchley f (PUI).

Additional material studied: USA: Mich.: Livingston Co. Edwin S. George Res. VIII.1933 (1 ex. CAS); Mich., Ann Arbor 29.IV.1941/27.V.1941/2.IV.1941 (4 exx. CAS); S. Dak.: 5 mi. N Elk Pt, gravel pit 5.IX.1940 (1 ex. CAS); S. Dak. Rosebud 5 mi. E, 18.VI.1941 (4 exx. CAS); Ia: Mt. Pleasant 28.V.1932 (1 ex. CAS); Ia, Blacksburg, VPI stream 19.VIII.1941 (1 ex. CAS); Massachusetts: Billerica 8.V.1927 (2 exx. CAS); Fall Riv. 19.V.1914/*H. p. pustulatus* Melsh. det. Young (2 exx. CAS); Sherborn 1.VII.1944 (2 exx. CAS); Rhode Island: Washington Co. Conanicut Is., pond on stream 6.VII.1959 (1 ex. MZH); RI, Providence (2 exx. CAS); Nebraska: Brown Co. Calamus Riv. Hwy 7, ca. 18 mi. N Brewster 17.VII.1967 (1 ex. CAS, 1 ex. MZH); Ohio: Columbus, Hess Pond 2.V.1941,/30.IV.1941 (8 exx. CAS); Wayne Co. Killbuck Swamp 10.V.1941,/21.V.1941 (2 exx. CAS); O., Athens 8.XI.1945 (1 ex. CAS); O, L. Hope Vinton Co. 13.X.1949/22.VII.1952 (9 exx. CAS); Indiana: Dune Park (4 exx. MNB); Pennsylvania: Pennsylv./Hist. Coll. 10065 (1 ex. MNB); New Jersey: Hartford 31.V.1941 (1 ex. CAS); N.J. Hillsdale VII.1941 (2 exx. CAS); NJ, Mt. Holly 13.VII.1941/VIII.1941 (2 exx. CAS); NY: L.I. Southold 10.VIII.1941 (2 exx. CAS); NY, L. Isl. (1 ex. CAS); Kansas: Atchison Coll. Farm, pond 19.VIII.1957 (1 ex. CAS); Missouri: Ripley Co., pond in woods E side rd, ca. 10 mi. N of Brian 5.VIII.1967 (3 exx. CAS, 1 ex. MZH); Va: Newport 16.VIII.1941/pond (1 ex. CAS); Tennessee: Knoxville 8.IV.1940 (2 exx. CAS); Tenn. Knoxville 9.IV.1940/pool in marsh (2 exx. CAS); Maryland: Baltimore 14.VI.1909 (1 ex. CAS); N.C.: Macon Co. Watauga area n. Franklin 21.VI.1985 pond Young/*H. p. pustulatus* (Melsh.) det. Young (2 exx. MZH); N.C., Macon Co., pond in Watauga Vista, N Franklin 21.VIII.1988/*H. p. pustulatus* det. Young (3 exx. CAS); S.C.: Gable 3.XI.1944 (4 exx. CAS); FLA: Entprise 12.XII. (5 exx. CAS); Fla, Alachua Co. (3 exx. CAS); Alachua Co. Payne Prairie nr Gainesville 21.VIII.1961/*H. pustulatus compressus* Shp det. Young (2 exx. CAS) ; Gainesville, black light 23.VI.1959 (1 ex. CAS); Dade Co. Miami Springs 2.VIII.1962 (18 exx. CAS, 5 exx. MZH); La Port Sulphur 4.IV.1944 (1 ex. CAS); Fla, Taylor Co. (1 ex. CAS); Fla, Brighton Okeechobee 16.VI.1929 (2 exx. CAS); Fla St. Angsne 20.V. (2 exx. CAS); Fla, Highlands Co., Lake Placid 7–11.VIII. 1966/*H. compressus* Shp det. Roughley 1976 (20 exx. MZH); Fla (2 exx. CAS); Am. bor./*H.*

compressus Shp (2 exx. MNB); Am. bor. (4 exx. MNB); (State unknown) Monroe 3.IX.1874 (1 ex. coll. Wewalka); America/*H. cuspidatus* Germ. ? (2 exx. MNHN). – Location unknown: Hist. Coll. (4 exx. MNB). – Uncertain record: Louisiana: N. Orleans/V. (1 ex. CAS). In all, 155 exx.

Diagnosis: Typical specimens of *H. pustulatus* are easily distinguished from closely related species. Elytra have a vague but clearly discernible colour pattern. The penis in dorsal view is, after distinct constriction, a little enlarged before again quite gradually narrowing to tip of penis. Particularly in the south of its range the species rarely exhibits a distinct colour pattern. Unicoloured specimens are often difficult to distinguish from specimens of *H. caraibus*. Thus the relationship between these species also needs further investigation.

Length of body: 2.20–3.02 mm, breadth: 1.44–2.04 mm. Habitus slightly variable (Figs 96–97).

Head: Pale ferrugineous to ferrugineous. Punctuation fine, sparse. In rather shallow frontal depressions and narrowly at eyes with denser punctures. Submat, microsculptured (meshes distinct). Head frontally rounded, margined (Fig. 98). Frontal margin rarely reduced close to eyes (Fig. 99). Antenna pale ferrugineous, rather slender, not distinctly modified (Fig. 100).

Pronotum: Pale ferrugineous to ferrugineous, mediobasally with a rather narrow darkened area. Anteriorly sometimes with a vague darkened area. Punctuation rather fine, somewhat sparse. Discally on each side with sparser and somewhat finer punctures. Submat, microsculptured (meshes distinct). Sides of pronotum somewhat rounded.

Elytra: Blackish to dark ferrugineous to dark brown, often with rather vague pale ferrugineous to ferrugineous areas (Fig. 96). Rather finely to fairly coarsely punctate. Punctuation somewhat sparse, apically finer. Coarsest in medial parts of each elytron. Rows of punctures sometimes discernible, but indistinct and mixed with adjacent punctures. Slightly mat, microsculptured (meshes distinct). Epipleura pale ferrugineous, with somewhat indistinct punctuation and finely to very finely microsculptured.

Ventral side: Dark ferrugineous to pale ferrugineous. Punctuation rather coarse and dense. Abdomen, except basally, almost impunctate. Rather shiny, microsculpture absent or indistinct. Abdomen submat, finely microsculptured. Prosternal process laterally narrowly margined, medial surface slightly impressed to almost flat, indistinctly punctate.

Legs: Pale ferrugineous to ferrugineous. Pro- and mesotarsi fairly broad.

Male genitalia: Figs 101–103.

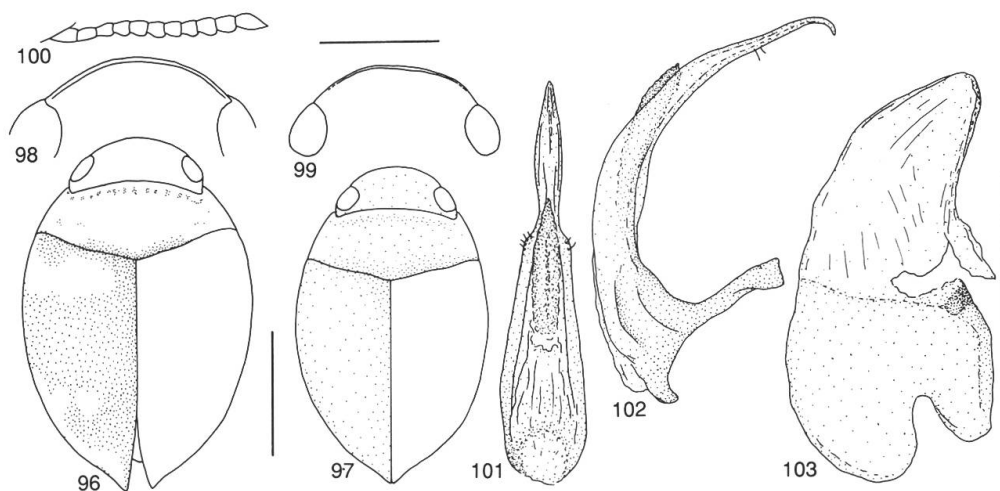
Female: Externally approximately as male. Rarely elytra somewhat mottled in female.

Larva: Fig. 18.

Distribution: USA: Rhode Island, South Dakota, Michigan, Iowa, Massachusetts, New Jersey, Maryland, New York, Nebraska, Ohio, Pennsylvania, Virginia, Indiana, Kansas, Missouri, Tennessee, North Carolina, South Carolina (exact location unknown), Louisiana, Florida (Fig. 110). Only personally verified records are mapped. Additional records from the USA are Maine (Malcolm, 1971), Wisconsin (Hilsenhoff, 1987) and Alabama (FOLKERTS, 1978). Outside USA the species has been reported from Cuba and Dominica (SPANGLER, 1981).

Biology: The species is reported to occur both in flatwoods and in uplands (in the latter more abundant). It seems to prefer margins of lakes to smaller ponds (YOUNG, 1954). In Missouri it occurred in a small *Potamogethon*-choked farm pond (SPANGLER, 1962). Sampled in a pool in a marsh, and also attracted by light.

Synonymy: Type material of *H. pustulatus* (Melsheimer) has not been available for study. My concept of the species is thus based on previous authors. The type material of *H. compressus* and *H. indianensis* have been examined. Additional studies include examination of over one hundred specimens. Different geographical morphs exist,



Figs 96–103: *Hydrovatus pustulatus*. – 96–97, habitus. – 98–99, head, frontal aspect. – 100, antenna. – 101, penis, dorsal aspect. – 102, penis, lateral aspect. – 103, paramere. (Figs 97, 99 are based on *H. compressus* type material.) Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

but intermediates between them are frequent. Thus I cannot distinguish them to their own species or even as subspecies. Possibly *H. caraibus* also belongs to this complex of names? At present *H. pustulatus* is the valid name for the species, by age-priority.

Hydrovatus concolor Sharp

Figs 104–110.

Hydrovatus concolor SHARP, 1887:751 (orig. descr., faun.); BLACKWELDER, 1944:75 (faun.); YOUNG, 1963:187–191 (descr., disc., faun.).

Type locality: Mexico City, Mexico.

Type material studied: Lectotype, m, by present designation: *Hydrovatus concolor* Type D.S. Mexico City Hge/Type/Mexico City Hge/Sharp Coll. 1905–313/B.C.A. Col. !. 2. *Hydrovatus concolor* Sharp (BMNH). – Paralectotype: Principally with same data as lectotype (1 ex. BMNH). In all, 2 exx.

Diagnosis: Closest probably to *H. kavanaughi*, below. Externally the two species are easily separated by the distinct colour pattern of the body exhibited by *H. kavanaughi* and by the quite rounded frontal part of the head in *H. concolor* (medially straightened in *H. kavanaughi*). Additionally the male protarsal claws are thickened in *H. kavanaughi*. Also the male genitalia provide useful characters for separation of *H. concolor*: Apex of the penis is narrow in *H. concolor*, while it is distinctly broader in *H. kavanaughi*.

Length of body: 2.70–2.72 mm, breadth: 1.76–1.80 mm. Habitus (Fig. 104).

Head: Blackish ferruginous to dark ferruginous. Punctuation fine to very fine, sparse. In rather shallow frontal depressions and at eyes punctures slightly coarser and denser. Rather shiny, finely microsculptured (meshes rather distinct). Head frontally rounded, from eye to eye finely margined (Fig. 105). Antenna pale ferruginous, rather slender, not distinctly modified (Fig. 106).

Pronotum: Blackish to dark ferruginous. Punctuation rather fine to fine, quite irregularly distributed. On each side discally with a broad area with fine and sparse punctuation. Slightly mat, finely microsculptured. Basally in middle microsculpture sometimes indistinct and partly absent. Sides of pronotum rounded.

Elytra: Black to dark ferruginous, palest apically but without distinct colour pattern. Punctuation fine to rather fine, fairly dense to sparse, somewhat irregularly distributed. Discal row of punctures basally clearly discernible. Dorsolateral and lateral rows of punctures indistinct, hardly discernible, irregular. Elytron laterally with a shallow groove. Slightly mat, finely microsculptured (meshes gene-

rally quite distinct). Epipleura ferrugineous to dark ferrugineous. Inner part of epipleuron with somewhat indistinct punctation, finely microsculptured.

Ventral side: Blackish to dark ferrugineous. Punctation rather fine to coarse, somewhat sparse to dense. Abdomen, except basally, almost impunctate (apically fine, sparse punctures discernible). Shiny, almost without microsculpture. Abdomen with very fine microsculpture. Prosternal process laterally rather finely margined, medial surface almost flat, distinctly punctate.

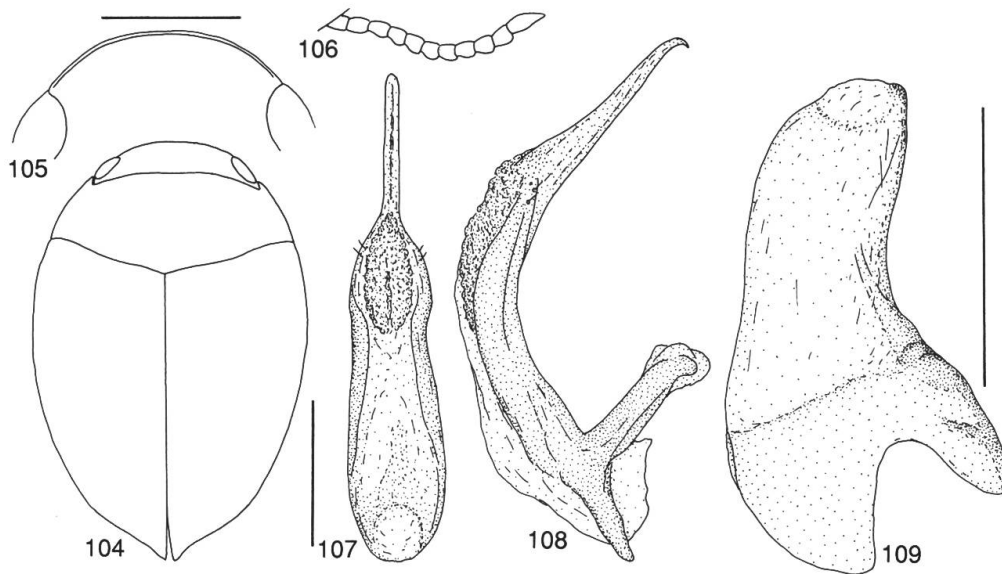
Legs: Dark ferrugineous to ferrugineous. Pro- and mesotarsi fairly broad.

Male genitalia: Figs 107–109.

Female: Unknown.

Distribution: Mexico (Fig. 110).

Biology: Unknown.



Figs 104–109: *Hydrovatus concolor*. – 104, habitus. – 105, head, frontal aspect. – 106, antenna. – 107, penis, dorsal aspect. – 108, penis, lateral aspect. – 109, paramere. Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; right scale 0.4 mm, male genitalia.

***Hydrovatus kavanaughii* n.sp.**

Figs 110–117.

Type locality: 23 mi. SE Tepic, Nayarit, Mexico.

Type material: Holotype, m: Mexico Nayarit 25 mi. SE Tepic 23.XI.1948 Hugh B. Leech (CAS). – Paratypes: Same as holotype (24 exx. CAS, 10 exx. MZH); Mex.: Nayarit 15 mi. SE of Tepic 28.XI.1948 (1 ex. MZH); Mex. Nayarit San Blas 17–21.IX.1953 B. Malkin (1 ex. CAS). In all, 37 exx.

Etymology: Named for Dr. David H. Kavanaugh (San Francisco), who has several times kindly arranged loans of material for my studies of Dytiscidae.

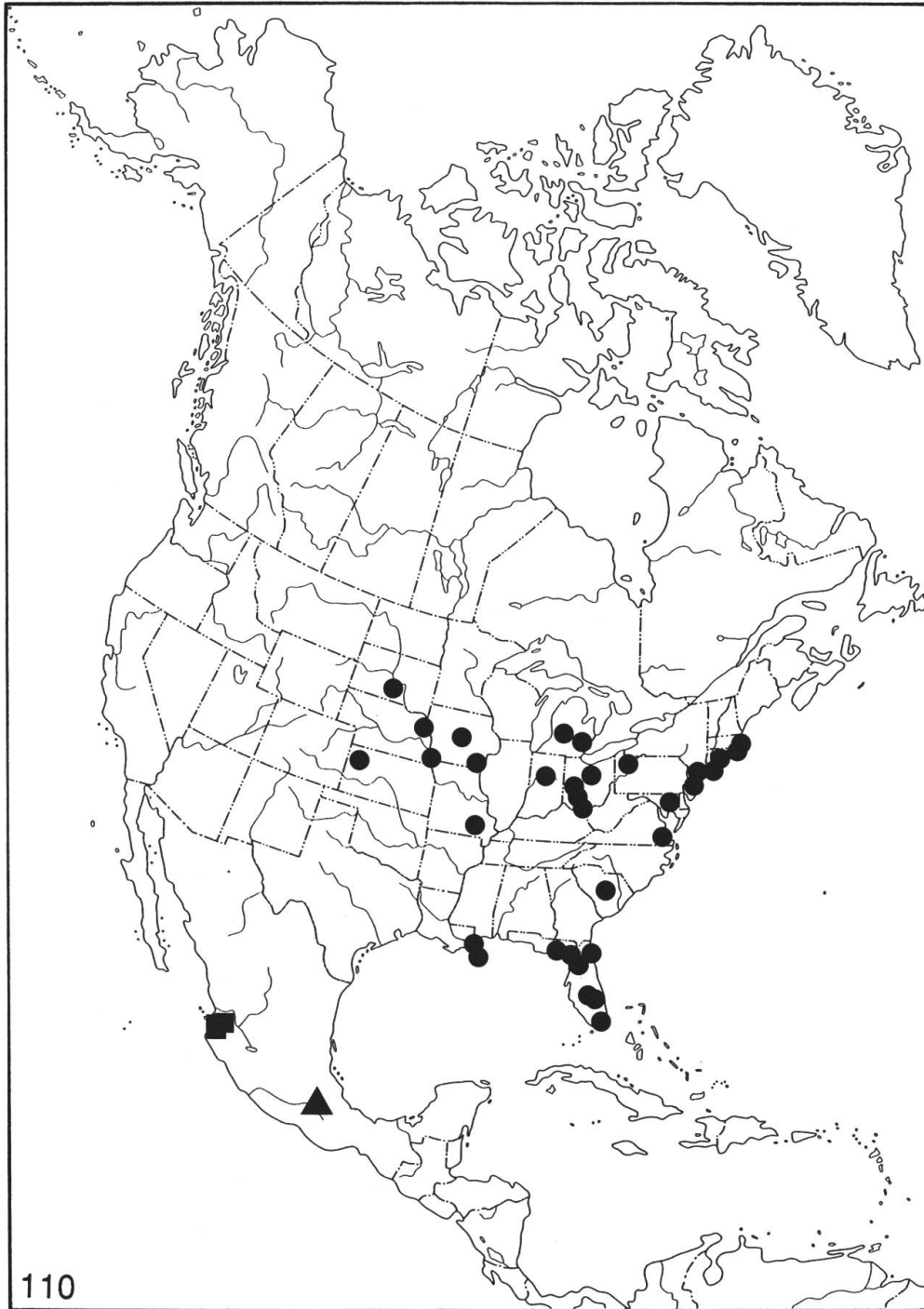


Fig. 110: Distribution of *Hydrovatus pustulatus* (dot), *H. concolor* (triangle) and *H. kavanaughi* (square).

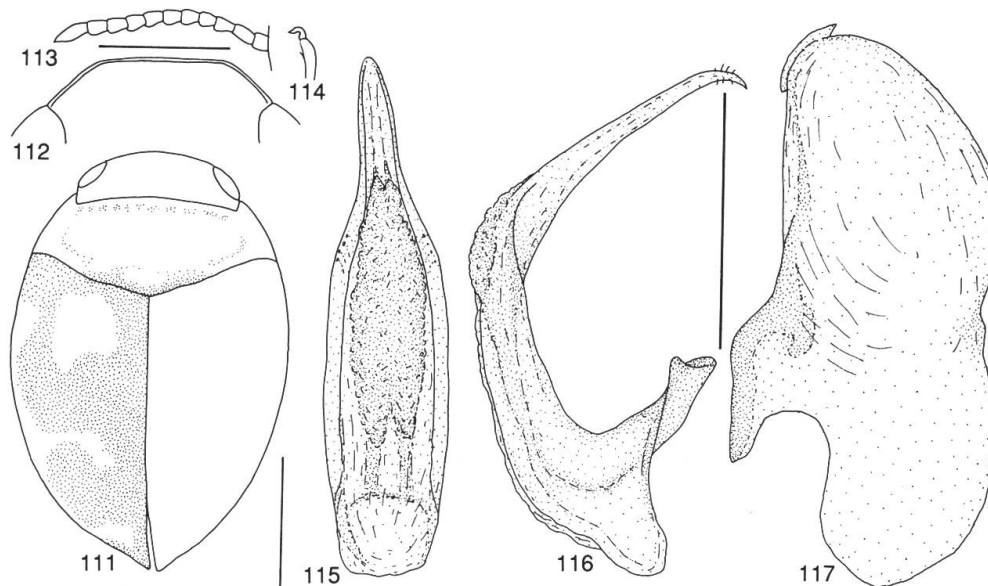
Diagnosis: See *H. concolor*, above.

Length of body: 2.80–3.06 mm, breadth: 2.04–2.26 mm. Habitus (Fig. 111).

Head: Pale ferruginous to pale brown. Punctuation fine to very fine, sparse, posteriorly hardly visible. In shallow frontal depressions and narrowly at eyes punctuation quite dense. Rather shiny, although microsculptured (meshes distinct). Head frontally rounded, medially straightened. From eye to eye finely margined (Fig. 112). Antenna pale ferruginous, rather slender, not distinctly modified (Fig. 113).

Pronotum: Pale ferruginous to pale brown, basally in middle with vague darkened area. Punctuation rather fine, quite dense, discally on each side punctures somewhat sparser. Rather shiny, very finely microsculptured (meshes basally very indistinct, partly obliterated). Sides of pronotum rounded.

Elytra: Blackish to dark ferruginous, with fairly distinct pale ferruginous spots (Fig. 111). Punctuation fine to rather fine, somewhat sparse. Apically and at epipleura with very fine punctures. Rows of punctures indistinct, absent or hardly visible. Elytra laterally with shallow furrow. Rather shiny, very finely microsculptured. Meshes partly indistinct, almost totally obliterated. Epipleura pale



Figs 111–117: *Hydrovatus kavanaughi*. – 111, habitus. – 112, head, frontal aspect. – 113, antenna. – 114, male protarsal claw. – 115, penis, dorsal aspect. – 116, penis, lateral aspect. – 117, paramere. Horizontal scale 0.5 mm, head, antenna and claw; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

ferrugineous, with fine, sparse and irregular punctation, shiny and very finely microsculptured.

Ventral side: Pale ferrugineous to ferrugineous. Punctation fairly coarse to rather fine, fairly dense. Abdomen, except basally, almost impunctate. Shiny, almost without microsculpture. Abdomen with very fine and partly indistinct microsculpture. Prosternal process laterally narrowly margined, medial surface almost flat, densely punctate.

Legs: Pale ferrugineous to ferrugineous. Pro- and mesotarsi somewhat enlarged. Protarsal claws symmetrical but quite thick (Fig. 114).

Male genitalia: Figs 115–117

Female: Externally as male, but protarsal claws simple.

Distribution: Mexico (Fig. 110).

Biology: Unknown.

Hydrovatus peninsularis Young

Figs 118–123, 137.

Hydrovatus peninsularis YOUNG, 1953b:21 (orig. descr., faun.); 1954:53 (descr., faun., biol.); 1956:53 (descr., faun.).

Type locality: Lake Newnan, east of Gainesville, Florida, USA.

Type material studied: Holotype, m: FLA Alachua County Lake Newnan east of Gainesville 279 ix.27.39 F.N. Young/Holotype m *Hydrovatus peninsularis* Young (UMMZ). – Paratypes: Same data as holotype but labelled as allotype (1 ex. UMMZ); FLA Alachua Co. Bivan's Arm 243 ii. 1939 F.N. Young/Paratype *Hydrovatus peninsularis* Young (1 ex. CAS, 1 ex. BMNH).

Additional material studied: USA: Florida: Alachua Co Payne Pr. S Gainesville 23.VII.1960 (1 ex. CAS); same but 10.VI.1987 (1 ex. MZH). In all, 6 exx.

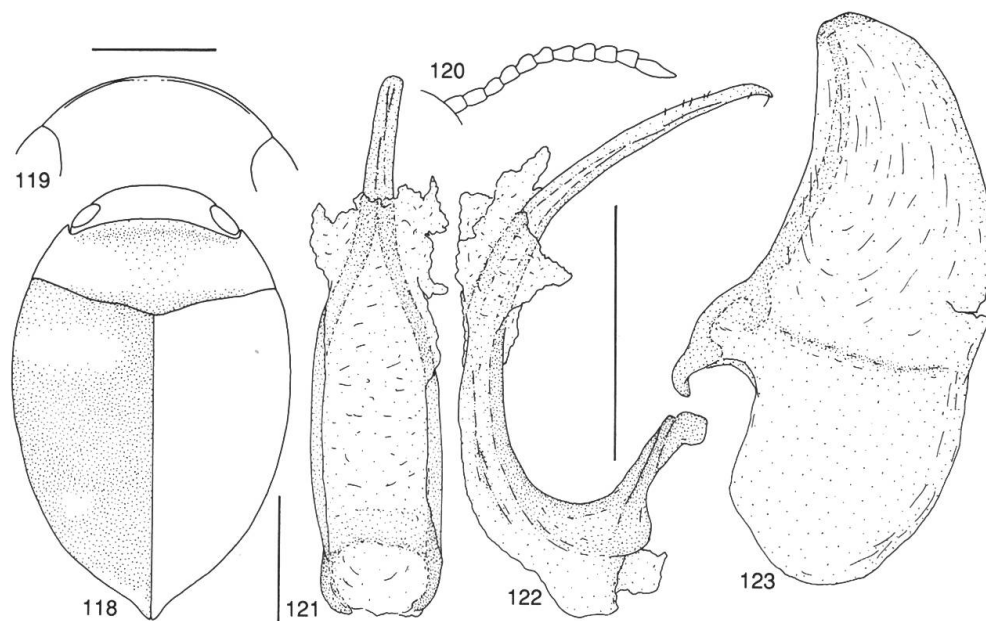
Diagnosis: *H. peninsularis* is a distinct species characterized particularly by large body size, by absence of distinct lateral furrows on elytra, and by the broad basal half of the penis. Additionally the penis (lateral view) is almost evenly curved from base to apex.

Length of body: 3.02–3.18 mm, breadth: 2.00–2.14 mm. Body quite robust (Fig. 118).

Head: Ferrugineous, frontally sometimes slightly paler. Punctation fine to very fine, rather sparse, somewhat irregularly distributed. At eyes and in shallow frontal depressions with denser punctures. Submat, microsculptured (meshes distinct). Head frontally rounded, finely margined, but margin reaches not to eyes. Sometimes margin medially broken for a short distance (Fig. 119). Antenna pale ferrugineous, slender, not distinctly modified (Fig. 120).

Pronotum: Blackish to dark ferrugineous, towards sides paler. At slightly rounded sides of pronotum ferrugineous. Sometimes ferrugineous areas extended so that pronotum darkened only frontally and basally. Punctuation fine, somewhat sparse. Discally on each side with a narrow impunctate area. Slightly mat, microsculptured (meshes distinct).

Elytra: Blackish to dark ferrugineous, with vague, ferrugineous areas (Fig. 118). Elytral colour pattern sometimes indistinct. Punctuation rather fine, quite dense, and evenly distributed. Rows of punctures absent or indistinct. Discal and lateral rows of punctures discernible but very indistinct, mixed with adjacent punctures. Rather shiny (a little more shiny than pronotum), microsculptured (meshes quite distinct). Epipleura ferrugineous to brownish, with somewhat indistinct punctures, rather shiny although microsculptured.



Figs 118–123: *Hydrovatus peninsularis*. – 118, habitus. – 119, head, frontal aspect. – 120, antenna. – 121, penis, dorsal aspect. – 122, penis, lateral aspect. – 123, paramere. Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

Ventral side: Dark ferrugineous to ferrugineous to brownish, abdomen slightly paler, ferrugineous to brownish. Fairly coarsely and densely punctate. Abdomen, except basally, almost impunctate. Rather shiny, almost without microsculpture. Abdomen submat, finely microsculptured. Prosternal process laterally finely margined, medial surface flat and punctate.

Legs: Pale ferrugineous to ferrugineous. Pro- and mesotarsi quite broad.

Male genitalia: Figs 121–123.

Female: Externally almost as male. Pro- and mesotarsi more slender.

Distribution: USA: Florida (Fig. 137).

Biology: Practically unknown.

Hydrovatus platycornis Young

Figs 124–129, 137.

Hydrovatus platycornis YOUNG, 1963:187 (orig. descr., faun.); FOLKERTS 1978:346 (faun.).

Type locality: Payne Prairie near Gainesville, Florida, USA.

Type material studied: Holotype, m: FLA Alachua Co. Payne Prairie nr Gainesville 23.VII.1960/*Hydrovatus platycornis* Young Holotype (UMMZ). – Paratypes: Same data as holotype (1 ex. MZH, 1 ex. UMMZ, 1 ex. BMNH); same data as holotype but 21.VIII.1961 (2 exx. ZSM, 1 ex. CAS); same data as holotype but 22.VIII.1961 (1 ex. ZSM); FLA Alachua Co. San Felasco Hammock T-9-S R-19-E Sec 18 722 IX.13 50 F.N. Young/Paratype/Brit. Mus. 1976–182/*Hydrovatus platycornis* Young/Paratype (1 ex. BMNH). In all, 9 exx.

Diagnosis: Easily recognized by the modified male antenna (only American species exhibiting this feature). *H. platycornis* is also characterized by the frontal aspect of the head (medially somewhat straightened), by shape of the penis (narrows quite gradually towards the apex in dorsal view), and by absence of distinct lateral furrows on elytra.

Length of body: 2.44–2.62 mm, breadth: 1.70–1.80 mm. Habitus (Fig. 124).

Head: Ferrugineous, frontally quite broadly pale ferrugineous. Punctuation fine to very fine, sparse, somewhat irregularly distributed. Punctures denser at eyes and in shallow frontal depressions. Slightly mat, microsculptured (meshes distinct). Head frontally rounded, medially somewhat straightened. Margined, but margin disappears a short distance from eyes (Fig. 125). Antenna pale ferrugineous, segments 3–10 somewhat enlarged (Fig. 126).

Pronotum: Ferrugineous, laterally with vague, pale ferrugineous areas, and anteriorly and posteriorly with somewhat vague blackish to dark ferrugineous areas. Punctuation rather fine, quite dense, discalily on each side with a narrow impunctate area. Slightly mat, microsculptured (meshes distinct). Sides of pronotum slightly rounded.

Elytra: Dark ferrugineous to ferrugineous, palest laterally. Without distinct colour pattern. Punctuation rather fine, quite dense and

quite evenly distributed. Apical punctures finer. Rows of punctures indistinct or absent (mixed with adjacent punctures). Sometimes an indistinct discal and lateral row of punctures discernible. Slightly mat, microsculptured (meshes distinct). Epipleura pale ferrugineous, with indistinct sporadic punctation, and rather shiny although finely microsculptured.

Ventral side: Ferrugineous, abdomen slightly paler, pale ferrugineous. Rather coarsely and densely punctate. Abdomen, except base, almost impunctate. Rather shiny, not distinctly microsculptured. Abdomen finely microsculptured. Prosternal process laterally margined, medial surface almost flat, finely punctate.

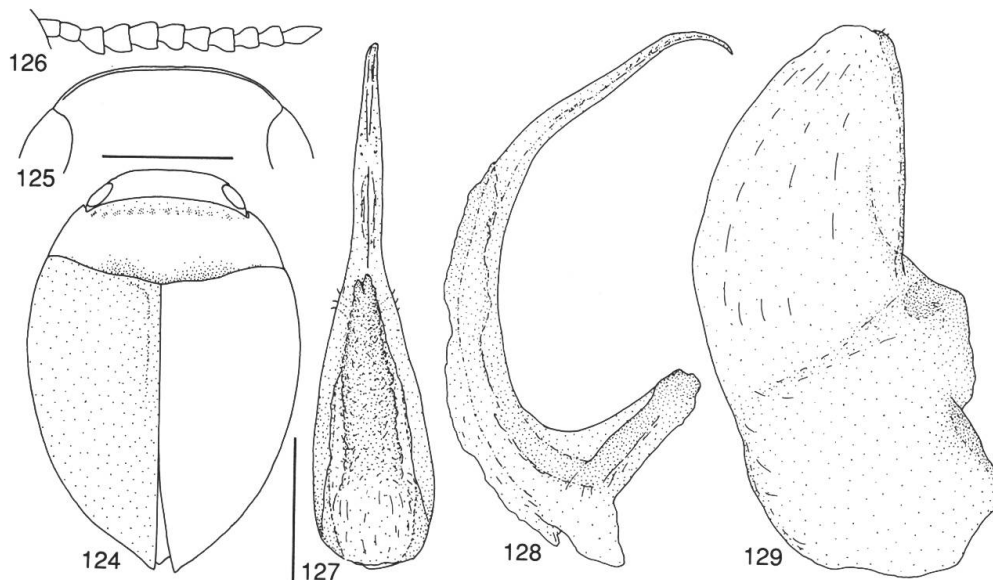
Legs: Pale ferrugineous to ferrugineous. Pro- and mesotarsi slightly enlarged.

Male genitalia: Figs 127–129.

Female: Similar to male but with unmodified antenna and slightly narrower pro- and mesotarsi.

Distribution: USA: Florida (Fig. 137). In the original description, YOUNG (1963) also gives Georgia. There is also an unverified record from Alabama, USA (FOLKERTS, 1978).

Biology: Unknown.



Figs 124–129: *Hydrovatus platycornis*. – 124, habitus. – 125, head, frontal aspect. – 126, male antenna. – 127, penis, dorsal aspect. – 128, penis, lateral aspect. – 129, paramere. Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

Hydrovatus youngi n.sp.

Figs 130–137.

Type locality: 20.5 mi. NW of Tepic, Nayarit, Mexico.

Type material: Holotype, m: Mexico, Nayarit Pond 20.5 mi. NW of Tepic, 24.XI.1948 Hugh B. Leech (CAS). – Paratypes: Same as holotype (37 exx. CAS, 12 exx. MZH); Mex. Nayarit 15 mi. SE of Tepic XI.23.1948 (2 exx. CAS); Tepic Nayarit, Mex. IX–21 to 24–53 B. Malkin (5 exx. CAS, 1 ex. MZH); Ixtlan del Rio, Nayarit Mexico IX.22.53 B. Malkin (2 exx. CAS); Mex. Nayarit San Blas IX–17 to 21–53 B. Malkin (1 ex. CAS); Mexico Jalisco 8 mi. E La Venta de Mochitiltic 20.VII.1955 R.B. Selander (5 exx. CAS, 1 ex. MZH); Mexico Jalisco 15 mi. NE of Atenquique 5.XII.1948 Hugh B. Leech (1 ex. CAS). In all, 68 exx.

Etymology: The new species is named after Professor Frank N. Young, Indiana, USA, who was the first to recognize its status as a species in itself.

Diagnosis: *H. youngi* is quite close to *H. hornii*. The two species are separated by the following features: the ventral outline of the penis in the new species has a minute process (ventral outline in *H. hornii* evenly curved) and the penis narrows gradually towards the apex (the penis narrows quite abruptly towards the apex in *H. hornii*). The two species differ from all other recognized *Hydrovatus* species by the deep lateral furrows on elytra.

Length of body: 3.14–3.30 mm, breadth: 2.20–2.30 mm. Body with distinct colour pattern (Fig. 130).

Head: Pale ferruginous to pale brown. Punctuation fine to very fine, irregularly distributed, posteriorly hardly visible. At eyes and in shallow frontal depressions with quite dense punctures. Slightly mat, microsculptured (meshes distinct). Head frontally rounded, medially somewhat straightened, from eye to eye narrowly margined (Fig. 131). Antenna pale ferruginous, slender (Fig. 132).

Pronotum: Pale ferruginous to pale brown, laterally with vague darkened areas. Punctuation fine to rather fine, quite dense and somewhat irregularly distributed. Punctuation sparsest discally. Slightly mat to fairly shiny, very finely and partly indistinctly microsculptured (meshes partly almost obliterated). Sides of pronotum almost straight.

Elytra: Blackish to dark ferruginous, with quite distinct pale ferruginous markings (Fig. 130). Punctuation rather fine to quite coarse, quite evenly distributed. Punctures coarsest at lateral furrows, and finest apically, close to suture and close to epipleura. Each elytron with a distinct lateral furrow (Fig. 133). Rows of punctures absent, mixed with adjacent punctures. Rather shiny to slightly mat, very finely microsculptured (meshes generally discernible, although

weakly developed). Epipleura pale ferrugineous, with rather sparse and irregularly distributed punctures. Rather shiny, although microsculptured.

Ventral side: Ferrugineous to pale ferrugineous. Punctuation rather fine to fairly coarse, fairly dense. Abdomen, except basally, almost impunctate. Rather shiny, almost without microsculpture, except abdomen which is finely reticulated. Prosternal process laterally finely margined, medial surface almost flat, densely punctate.

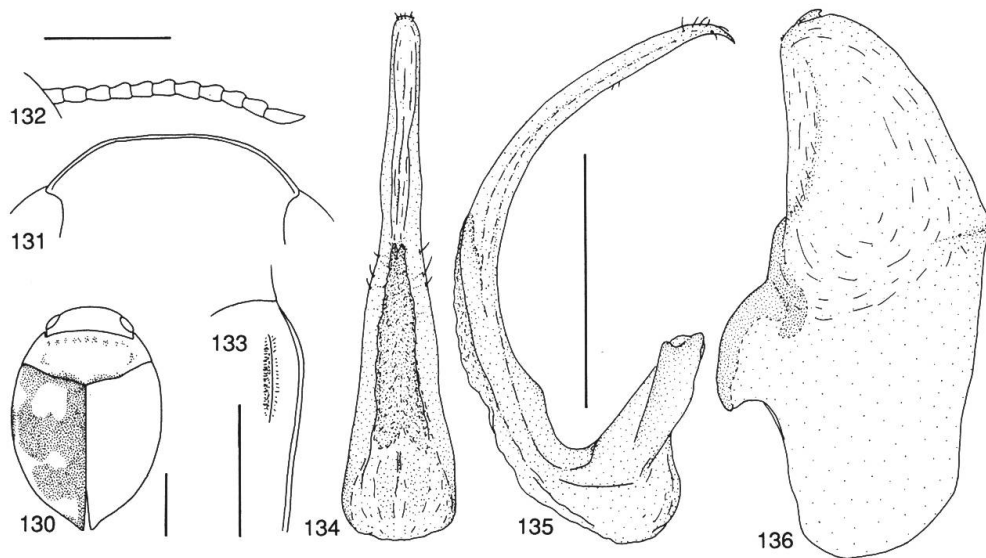
Legs: Pale ferrugineous to pale brown. Pro- and mesotarsi slightly enlarged.

Male genitalia: Figs 134–136.

Female: Externally approximately as male, but with more mat elytra because of more strongly developed reticulation.

Distribution: Mexico (Fig. 137).

Biology: Unknown.



Figs 130–136: *Hydrovatus youngi*. – 130, habitus. – 131, head, frontal aspect. – 132, antenna. – 133, elytral furrow. – 134, penis, dorsal aspect. – 135, penis, lateral aspect. – 136, paramere. Horizontal scale 0.5 mm, head and antenna; left scale 1 mm, habitus; middle scale 1 mm, elytral furrow; right scale 0.4 mm, genitalia.

Hydrovatus hornii Crotch

Figs 137–144.

Hydrovatus hornii CROTCH, 1873:387 (orig. descr., faun.); SHARP, 1882a:814 (descr., disc., faun.); BRANDEN, 1885:26 (faun.); ZIMMERMANN, 1920a:34 (faun., list.); LENG, 1920:77 (faun.); YOUNG, 1953b:21 (disc.); 1956:53 (descr., faun.); SPANGLER & VEGA, 1982:37 (descr., disc., faun., biol).

Hydrovatus major SHARP, 1882a:335 (orig. descr., faun.); 1882b:15 (faun.); BRANDEN, 1885:26 (faun.); HORN, 1895:313 (disc., faun.); ZIMMERMANN, 1919:128

(faun.); 1920a:34 (faun.); LENG, 1920:77 (faun.); BLACKWELDER, 1944:75 (faun.); LEECH, 1948:388 (disc., faun.); YOUNG, 1953b:21 (disc.); 1956:53 (faun.); SPANGLER & VEGA, 1982:37 (syn. of *H. hornii*).

Type locality: Texas, USA.

Type material: *H. hornii*: Texas (Belfrage, 899). Not located. – *H. major*: Lectotype, m, designated by SPANGLER & VEGA (1982): 1122/m Lectotype/Duenas Guatemala G.C. Champion /B.C.A. Col. I.2. *Hydrovatus major* Sharp/Sharp Coll. 1905–313/Lectotype m *Hydrovatus major* Sharp Spangler des. 1982/*H. major* Shp. (= *H. horni* Cr.) fide P.J. Spangler (BMNH). – Paralectotypes: Female mounted on same card as lectotype (1 ex. BMNH); Guatemala Duenas (1 ex. ZSM, 1 ex. USNM, loan through Prof. Frank N. Young).

Additional material studied: USA: Texas: Pt. Isabel 20.X.1949 (1 ex. CAS); Brownsville 27.IX.1942 (3 exx. CAS, 1 ex. MZH); Refugio Co. 9.VI.1960 (1 ex. MZH). – Mexico: 15 mi. E C. del Maiz, SLP 19.XI.1948/*H. horni* Cr. det. F.N. Young (4 exx. CAS, 1 ex. MZH); S.L. Potosi Mante 23.III.1963 (1 ex. CAS); Tamaulipas Magiscatzin, Rio Guayalejo 24.III.1963 (1 ex. CAS). – Guatemala: Duenas/*H. major* Sharp (3 exx. MNB). – Jamaica: May Pen 26.II.1937 (3 exx. coll. Young). In all, 22 exx.

Diagnosis: See diagnosis of *H. youngi* above.

Description: only differences to description of *H. youngi* are recognized.

Length of body: 3.00–3.76 mm, breadth: 2.24–2.72 mm. Habitus (Fig. 138).

Head: Pale to dark ferrugineous. Rather shiny, finely microsculptured (meshes partly rather indistinct). Frontal aspect of head (Fig. 139). Antenna (Fig. 140).

Pronotum: Anteriorly also with darkened area. Colour pattern sometimes indistinct and pronotum then almost evenly dark. Sides of pronotum almost straight to somewhat rounded.

Elytra: Blackish ferrugineous to dark ferrugineous, with slightly vague ferrugineous to pale ferrugineous spots (Fig. 138). Colour pattern sometimes indistinct, and elytra then almost unicoloured dark. Punctuation rather fine to quite coarse, dense, apically punctures finer. Lateral furrow of elytra (Fig. 141). Epipleural punctuation fairly coarse.

Ventral side: Dark to pale ferrugineous to pale brownish.

Male genitalia: Figs 142–144.

Female: Externally similar to male.

Distribution: USA: Texas, Mexico, Guatemala, Jamaica (Fig. 137). Spangler & Vega (1982) also gives Cuba.

Biology: Spangler & Vega (1982) reports that the species occurred in Cuba in the weedy margins of a pasture pond which also contained mats of the water hyacinth *Eichhornia crassipes*; the substrate of the pond was mud.

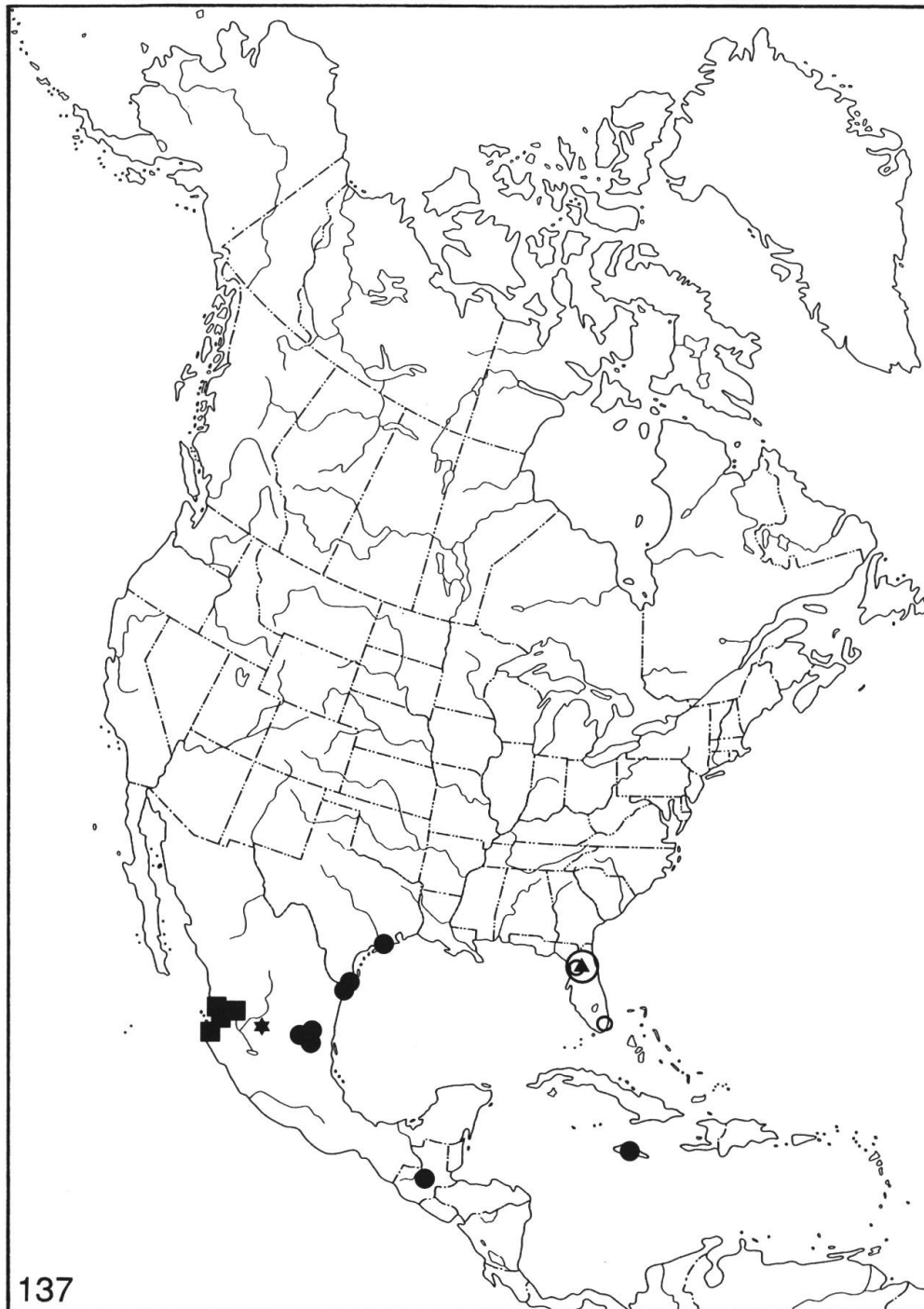
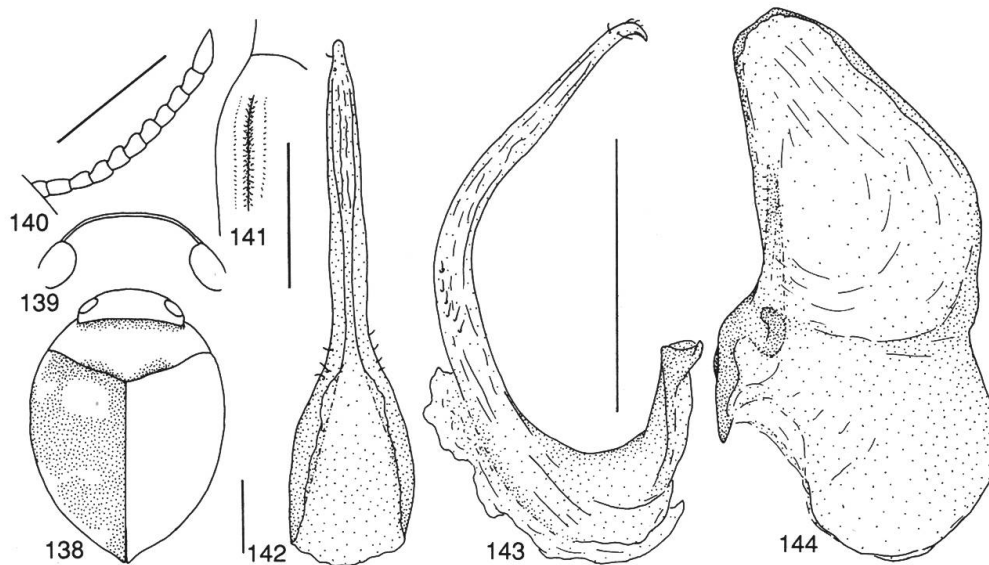


Fig. 137: Distribution of *Hydrovatus peninsularis* (large circle), *H. platycornis* (triangle), *H. youngi* (square), *H. hornii* (dot), *H. longior* (star) and *H. inexpectatus* (small circle).

Synonymy: I have here followed the synonymy of *H. hornii*, and *H. major*, proposed by Spangler & Vega (1982). The name *H. hornii*, being older, is the valid name of the species.



Figs 138–144: *Hydrovatus hornii*. – 138, habitus. – 139, head, frontal aspect. – 140, antenna. – 141, elytral furrow. – 142, penis, dorsal aspect. – 143, penis, lateral aspect. – 144, paramere. Slanting scale 0.5 mm, antenna; top left scale 1 mm, head and elytral furrow; bottom left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

***Hydrovatus longior* n.sp.**

Figs 137, 145–151.

Type locality: 12 mi. S. Ojuelos de Jalisco, Mexico.

Type material: Holotype, m.: Mexico, Jalisco: 12 mi. S Ojuelos de Jalisco 21.XI.1948 Hugh B. Leech (CAS).– Paratypes: Same as holotype (1 ex. CAS, 1 ex. MZH). In all, 3 exx.

Diagnosis: Easy to distinguish from all other recognized *Hydrovatus* species by an elongated body in combination with the male genitalia shape which is characteristic for most American species. Note also slight ventrolateral expansion apically on penis.

Length of body: 3.02–3.28 mm, breadth: 1.88–2.02 mm. Habitus (Fig. 145).

Head: Blackish to dark ferrugineous, frontally slightly paler. Punctuation fine, rather sparse, irregularly distributed, posteriorly almost absent. In shallow frontal depressions and at eyes with denser punctures. Rather shiny, although microsculptured (meshes discernible). Head frontally rounded, medially somewhat straightened. From eye to eye narrowly margined (Fig. 146). Antenna pale ferrugineous, rather slender, not distinctly modified (Fig. 147).

Pronotum: Blackish to dark ferrugineous, laterally slightly paler. Punctuation rather fine, quite dense. Medial quite broad area with sparser and more irregularly distributed punctures. Rather shiny,

very finely microsculptured (reticulation partly hardly visible, almost obliterated). Sides of pronotum slightly rounded.

Elytra: Blackish to dark ferrugineous, without distinct colour pattern. Punctuation rather fine to fine, somewhat sparse and quite evenly distributed. Discal and lateral rows of punctures are indistinct but generally discernible; dorsolateral row absent. Rather shiny, although microsculptured (meshes quite distinct). Epipleura ferrugineous to dark ferrugineous. Finely and quite sparsely punctate. Rather shiny, although finely reticulated.

Ventral side: Blackish to dark ferrugineous. Fairly coarsely and quite densely punctate. Abdomen almost impunctate except basally, with clearly visible although shallow punctures and apical sternite, with fine but quite dense punctures. Shiny, almost without microsculpture. Abdomen finely microsculptured. Prosternal process laterally distinctly margined, medial surface slightly convex, densely punctate.

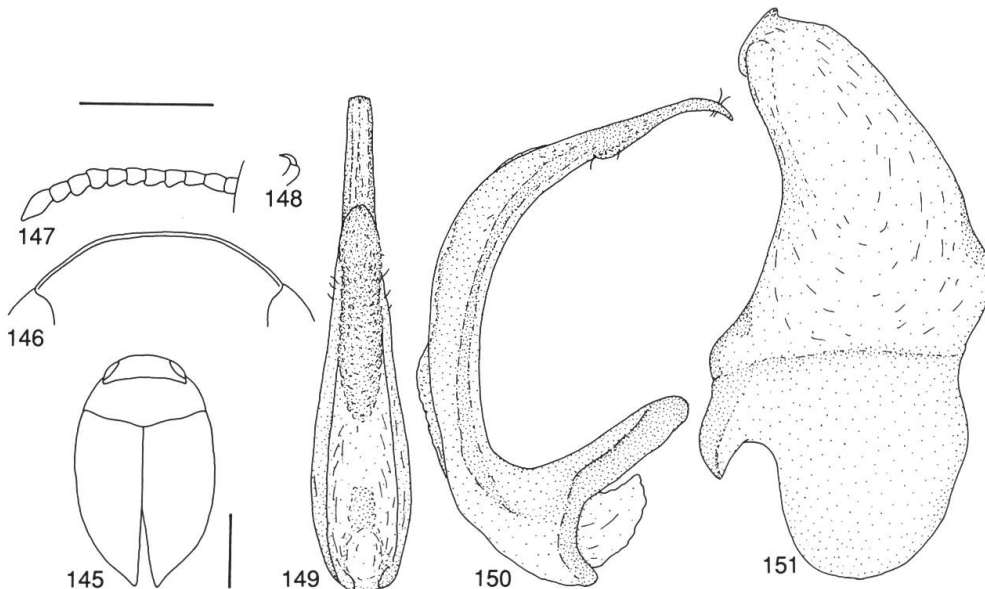
Legs: Pro- and mesotarsi somewhat enlarged. Protarsal claws symmetric, slightly thickened (Fig. 148).

Male genitalia: Figs 149–151.

Female: Externally almost as male.

Distribution: Mexico (Fig. 137).

Biology: Unknown.



Figs 145–151: *Hydrovatus longior*. – 145, habitus. – 146, head, frontal aspect. – 147, antenna. – 148, male protarsal claw. – 149, penis, dorsal aspect. – 150, penis, lateral aspect. – 151, paramere. Horizontal scale 0.5 mm, head, antenna and claw; left scale 1 mm, habitus; right scale 0.4 mm, genitalia.

Hydrovatus inexpectatus Young

Figs 137, 152–157.

Hydrovatus inexpectatus YOUNG 1963:185 (orig. descr., faun.).

Type locality: Payne Prairie S of Gainesville, Florida, USA.

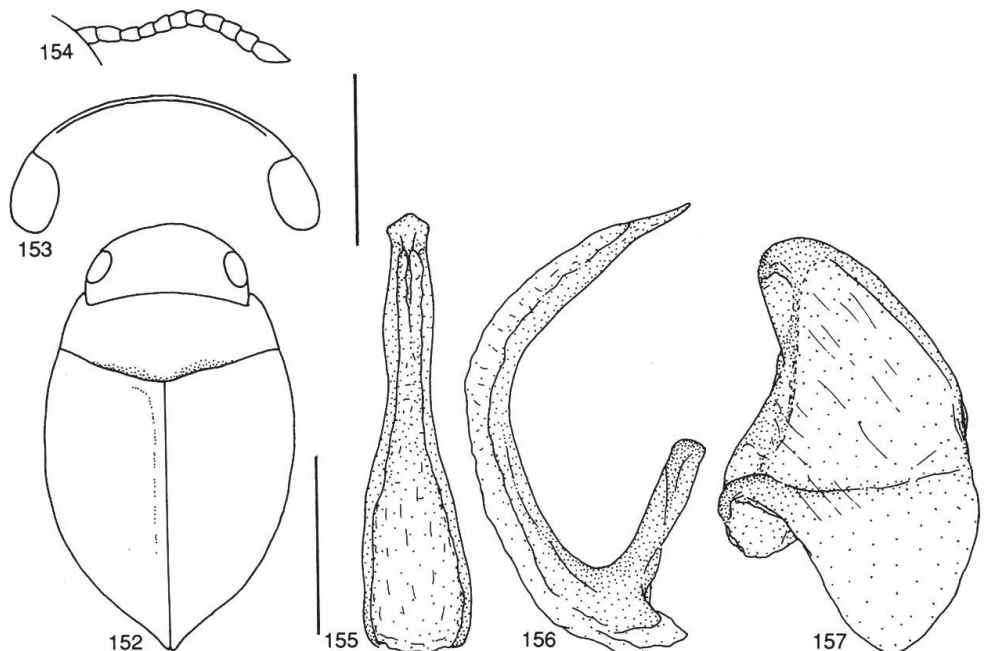
Type material studied: Holotype, m: FLA Alachua County Payne Prairie S of Gainesville vv.23.60 #1824 F.N. Young/Holotype m *Hydrovatus inexpectatus* Young (UMMZ). – Paratypes: Same data but with allotype label (1 ex. UMMZ); FLA Dade County Miami/BLTIX 13.60 P.E. Briggs/Paratype/*Hydrovatus inexpectatus* Young (1 ex. ZSM).

Additional material studied: USA: FLA Dade Co. Pinecrest (1 ex. coll. Young). In all, 4 exx.

Diagnosis: A distinct species particularly characterized by a small body, by a frontal margin of the head which does not reach the eyes, and by the apex of the penis which is distinctly expanded apically.

Length of body: 1.92–2.20 mm, breadth: 1.22–1.34 mm. Habitus (Fig. 152).

Head: Pale ferrugineous. Punctuation very fine, sparse, hardly visible. Narrowly at eyes and in shallow frontal depressions with denser and slightly coarser punctures. Submat, microsculptured (meshes distinct). Head frontally rounded, finely margined, but margin does not reach eyes (Fig. 153). Antenna pale ferrugineous, rather slender, not distinctly modified (Fig. 154).



Figs 152–157: *Hydrovatus inexpectatus*. – 152, habitus. – 153, head, frontal aspect. – 154, antenna. – 155, penis, dorsal aspect. – 156, penis, lateral aspect. – 157, paramere. Top left scale 0.5 mm, head and antenna; left bottom scale 1 mm, habitus; right scale 0.4 mm, genitalia.

Pronotum: Ferrugineous, laterally slightly paler. Basally with vague minute darkened areas (Fig. 152). Punctuation fine, sparse, discally on each side with narrow impunctate area. At pronotal margins with an irregular row of slightly coarser punctures. Submat, microsculptured (meshes distinct). Sides of pronotum somewhat rounded.

Elytra: Ferrugineous to pale ferrugineous, sometimes with vague colour pattern. Punctuation rather fine, somewhat sparse and somewhat irregularly distributed. Rows of punctures absent or very indistinct and mixed with adjacent punctures. Rather shiny, microsculptured (meshes distinct). Epipleura pale ferrugineous, with rather sparse, quite coarse punctuation, rather shiny although microsculptured.

Ventral side: Pale ferrugineous to ferrugineous. Rather finely to quite coarsely punctate. Abdomen basally with fine, rather sparse punctuation which towards apex almost disappears. Submat, distinctly microsculptured. Prosternal process laterally very finely margined, medial surface flat, finely punctate and distinctly microsculptured.

Legs: Pale ferrugineous to ferrugineous. Pro- and mesotarsi somewhat enlarged.

Male genitalia: Figs 155–157.

Female: Externally as male.

Distribution: USA: Florida (Fig. 137).

Biology: Unknown.

6.5.4. Species group 4 (sp.gr. *confossus*)

Hydrovatus vicinus Guignot

Figs 158–163, 179.

Hydrovatus vicinus GUIGNOT, 1958b:3 (orig. descr., faun.); BILARDO & ROCCHI, 1987:96 (disc.).

Type locality: Parc National Garamba, Zaire.

Type material studied: Holotype, m: Holotypus/Congo Belge PNG Miss. H. De Saeger II/gc/13s, 3.IX.1951 Rc. H. De Saeger, 2359/Coll. Mus. Congo (ex. coll. I.P.N.C.B.)/Guignot det., 1957 *Hydrovatus (Vathydrus) vicinus* n.sp. Holotype (MAC). – Paratypes: Same sampling data as holotype (1 ex. MAC, 1 ex. ISN). In all, 3 exx.

Diagnosis: Belongs to a complex of species (see below), which are very difficult to distinguish. *H. vicinus* is characterized by a small, quite globular body, by a frontal margin of head which reaches the eyes, and by a comparatively broad and medially almost parallel-sided penis. Correct determination requires comparison with type.