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CHRYSOMELIDAE: Aquatic leaf beetles of China

(Coleoptera)

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Abstract

An overview of leaf beetles (Coleoptera: Chrysomelidae) associated with aquatic habitats in China is provided. It contains a key to genera, a list of species known to be associated with aquatic habitats in China and illustrations of the main leaf beetle groups and characters used for their identification.

Key words: Coleoptera, Leaf beetles, Chrysomelidae, aquatic habitats, China.

Introduction

Leaf beetles are one of the largest families of beetles with more than 50,000 described species worldwide. They inhabit a great array of environments including such extremes as desert and arctic. Although the majority of leaf beetles are associated with terrestrial habitats, a number of species feed on aquatic plants and exhibit various degrees of adaptation to aquatic habitats. Leaf beetles of three subfamilies are known to be Phytophilous Water Beetles (sensu JÄCH 1998): Donaciinae, Chrysomelinae, and Galerucinae.

All donaciines are obligatorily associated with aquatic habitats. This group includes the genus *Macroplea* SAMOUELLE, the only chysomelid with adults spending some time feeding under water. The other donaciines are less closely associated with water. Their larvae are truly aquatic living under water on the roots of aquatic plants, e.g. larvae of *Macroplea*, but adults feed on the parts of aquatic plants situated above water. The water associated chrysomelines and galerucines are even less aquatic with both larvae and adults feeding externally on leaves which either float on the water surface or are situated vertically above water, so there are no stages living on submersed parts of the plants.

The Chinese leaf beetle fauna is one of the most speciose regional faunas with more than 2,000 species (GRESSITT & KIMOTO 1961, 1963). Although it is extremely poorly known and not well collected, material discovered in recent years in China suggests that the actual number of species may be as high as 4,000. The "aquatic" leaf beetles of China also are very poorly known, and extensive additional collecting is needed to provide material necessary for comprehensive revision. This paper provides an overview of aquatic leaf beetles in China, a key to genera, and a list of species known to be associated with aquatic habitats.

Acronyms & CWBS locality:

NMW Naturhistorisches Museum Wien
USNM National Museum of Natural History, Washington DC

CWBS loc. 348: **Yünnan Province**, Kunming City Region, plain near River Panlong, northern part of Kunming City, ca. 1800 m a.s.l.; rice fields (partly abandoned), irrigation canals and muddy pools; 2.XI.1999; leg. M.A. Jäch, H. Schönmann, M. Wang & Y. Wei (see JÄCH & JI 2003: Fig. 4).

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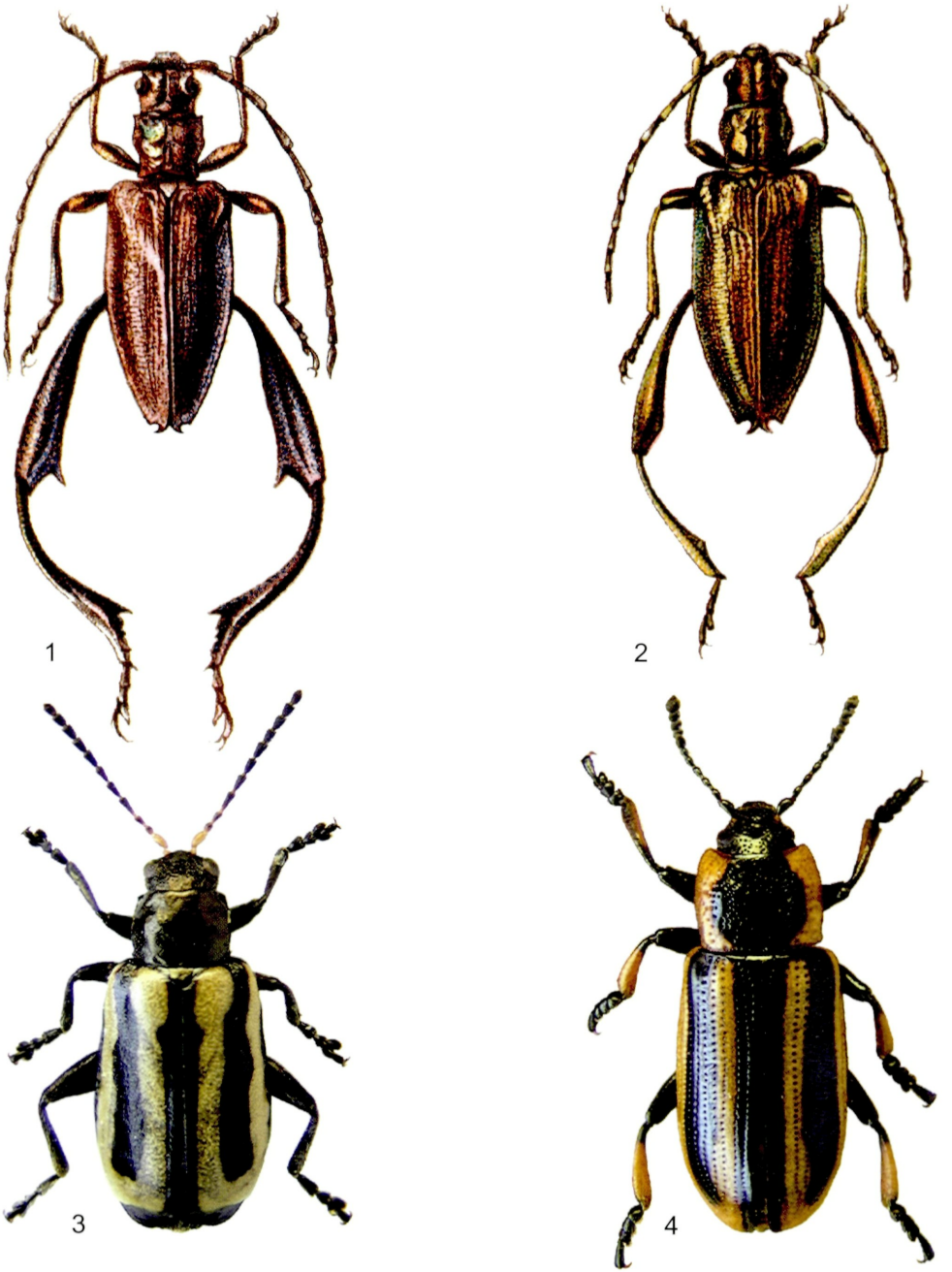

Figs. 1 - 4: Habiti of leaf beetles: 1- 2: *Sominella macrocnemia* (after JACOBSON 1909), 1) ♂, 2) ♀; 3) *Agasicles hydrophila*; 4) *Prasocuris phellandrii*.

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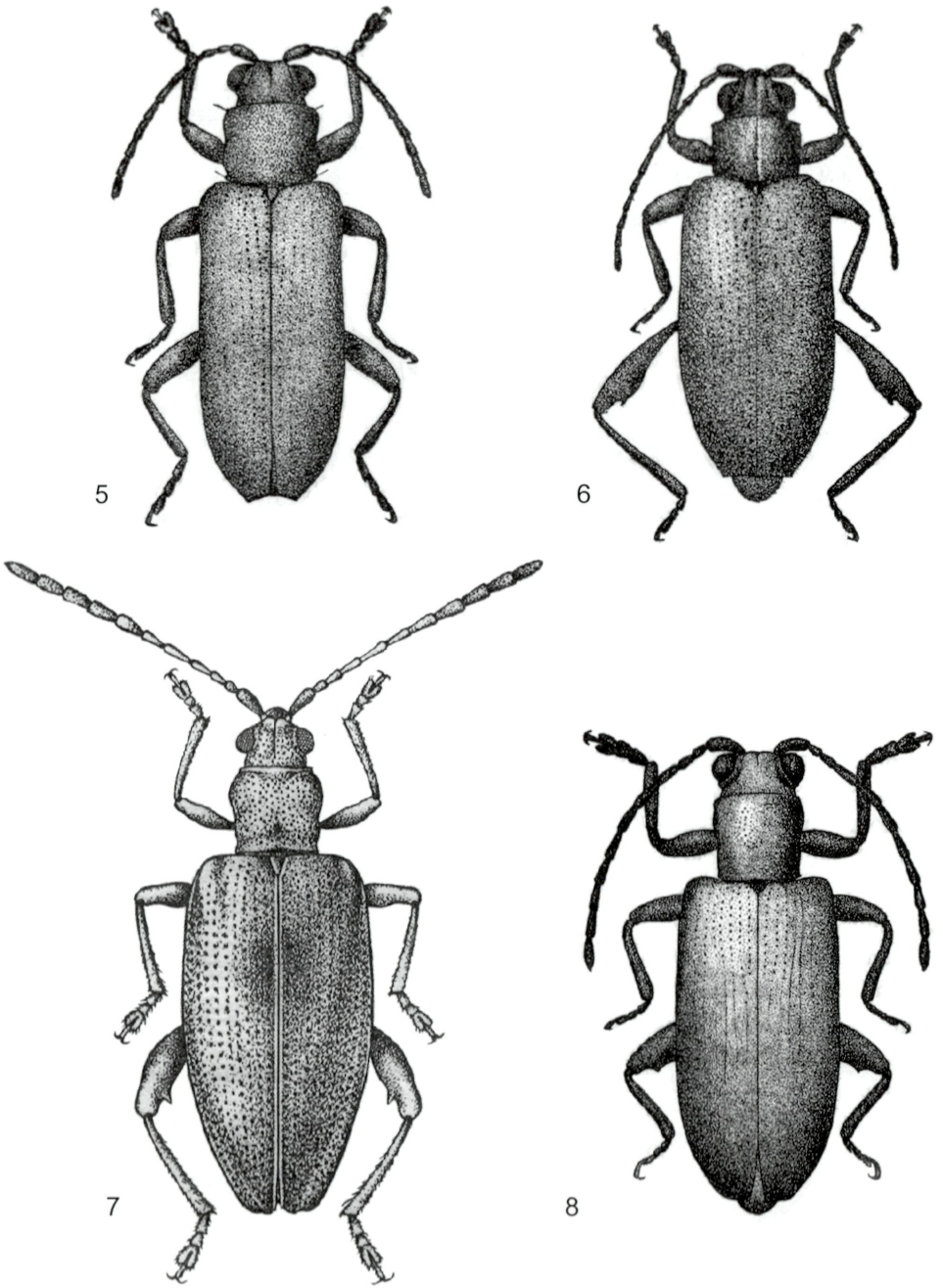

Figs. 5 - 8: Habiti of leaf beetles: 5) *Donacia* (s.str.) *frontalis*; 6) *Donacia* (*Cyphogaster*) *tuberfrons*; 7) *Donaciasta assama*; 8) *Plateumaris socia* (Figs. 5, 6, 8 after GRESSITT & KIMOTO 1961).

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Key to genera

1 Ventral surface covered with dense, short setae. Antenna situated on raised tubercles (Fig. 13) (Donaciinae) 2

- Ventral surface covered with sparse, long setae. Antenna not situated on raised tubercles (Figs. 14, 15) 8

2 Elytron with outer apical angle prolonged as spine (Fig. 11). Apical tarsomere as long as three basal tarsomeres together (Fig. 12) ..... ***Macroplea***

- Elytron without spine on outer apical angle (Figs. 9, 10). Apical tarsomere much shorter than three basal tarsomeres together 3

3 Elytron with inner ridge of sutural interval distinctly sinuate before apex, joined with outer ridge as single bead, explanate sutural margin exposed below (Fig. 10). Pronotal hypomeron without broad pubescent area above procoxa ..... ***Plateumaris***

- Elytron with inner ridge of sutural interval straight, interval more or less uniformly wide to near apex, and explanate margin not broadly exposed (Fig. 9). Pronotal hypomeron with broad pubescent area above procoxa 4

4 Labrum with apex broadly and deeply emarginate 5

- Labrum with apex broadly rounded 6

5 Elytron with epipleuron flat or slightly rounded from behind humerus to near apex; dorsum pale metallic green or bronzish ..... ***Donaciella***

- Elytron with epipleuron angulate from behind humerus to near apex; dorsum color various..... ..... ***Donacia***(part)

6 Pronotum with anterolateral setae present. Dorsum, except head, brown or testaceous. Antenna sparsely pubescent basally ..... ***Donaciasta***

- Pronotum with anterolateral setae absent. Dorsum entirely metallic in color. Antenna densely pubescent basally 7

7 Pronotal hypomeron coarsely rugose longitudinally, without dense patch of pubescence above coxa. Elytral apex usually toothed on inner apical margin (Figs. 1, 2) ..... ***Sominella***

- Pronotal hypomeron sparsely rugose longitudinally, with dense patch of pubescence above coxa. Elytral apex without tooth on inner apical margin ..... ***Donacia***(part)

8 Distance between antennal sockets three times greater than diameter of antennal socket. Eye three times taller than wide. Antennal calli absent (Figs. 4, 14). Anterolateral corner of pronotum without setiferous pore (Chrysomelinae) ..... ***Prasocuris***

- Distance between antennal sockets less than two times greater than diameter of antennal socket. Eye less than two times taller than wide. Antennal calli present (Fig. 15). Anterolateral corner of pronotum with setiferous pore (Galerucinae) 9

9 Pronotum and elytra covered with short hairs. Color of dorsum yellowish or brownish without spots or stripes ..... ***Galerucella***

- Pronotum and elytra glabrous. Color of dorsum black with yellow spots or stripes (Fig. 3)..... ..... ***Agasicles***

List of Chinese leaf beetle taxa associated with aquatic habitats

In their treatment of leaf beetles of China GRESSITT & KIMOTO (1961) mentioned a number of aquatic species that are known from countries adjacent to China but to date not collected in China. These species are *Donacia crassipes* FABRICIUS, 1775, *D. gracilipes* JACOBY, 1885, *D. intermedia* JACOBSON, 1899, *D. jacobsoniana* SHAVROV, 1946, *D. simplex* FABRICIUS, 1775, *D. tschitscherini* SEMENOV, 1895, *D.* (*Cyphogaster*) *javana* WIEDEMANN, 1821, *D.* (*C.*) *delesserti* GUERIN, 1844, *Juliusina mongolica* (SEMENOV) 1895, *Plateumaris* (s.str.) *amurensis* WEISE,

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1898, *P. anularis* REITTER, 1920, *Prasocuris weisei* REITTER, 1901. These species are excluded from the following list. The list provides the species name, author, date and page of description or indication followed by the type locality, general distribution, known host plants and citations of major references. These works should be considered for complete taxonomic bibliographies including synonyms, although the list contains synonyms proposed during the last 20 years.

The list of Donaciinae is arranged according to ASKEVOLD (1990). The list also includes *Agasicles hydrophyla* SELMAN & VOGT, a neotropical flea beetle introduced into China in 1986 for control of alligator weed (*Alternanthera philoxeroides* (MARTIUS) GRISEBACH) (JULIEN 1992). Since specimens of this species were collected far from the places were it was initially released (Sichuan and Zhejiang) we provide exact location data.

Donaciinae

Donaciella REITTER, 1920

Donaciella clavipes (FABRICIUS, 1793: 117) (Germany). Distribution: Europe, Central Asia, Siberia, NE China (GRESSITT & KIMOTO 1961, TAN et al. 1985).

Donacia FABRICIUS, 1775

Donacia (*Donaciomima*) *aquatica* (LINNAEUS, 1758: 396) (Europe). Distribution: N China (BOROWIEC 1984). Host plants: *Sparganium simplex* HUDS. (BOROWIEC 1984).

Donacia (*Donaciomima*) *bicoloricornis* CHEN, 1941: 10 (E China). Distribution: E China (GRESSITT & KIMOTO 1961, BOROWIEC 1984, TAN et al. 1985)

Donacia (*Donaciomima*) *flemola* GOECKE, 1944: 7 (NE China). Distribution: NE China, E Siberia, Korea (GRESSITT & KIMOTO 1961).

Donacia (*Donaciomima*) *frontalis* JACOBY, 1893: 261 (E China). Distribution: E China (GRESSITT & KIMOTO 1961, CHEN 1966).

Donacia (*Donaciomima*) *kweilina* CHEN, 1966: 145 (Guangxi, China). Distribution: China (CHEN 1966, BOROWIEC 1984).

Donacia (*Donaciomima*) *semenovi* JACOBSON, 1907: 5 (NE China). Distribution: NE China (TAN et al. 1985).

Donacia (*Donaciomima*) *thalassina* GERMAR, 1811: 29 (Europe). Distribution: Europe, Siberia, Mongolia, NW China. Host plants: *Eleocharis macrostachya* BRITTON (= *Heleocharis palustris*), *Carex versicaria* L. (BOROWIEC 1984).

Donacia (*Donaciomima*) *transversicollis* FAIRMAIRE, 1887: 135 (Yünnan, China). Distribution: SW China (GRESSITT & KIMOTO 1961).

Donacia (Donacia) clavareaui JACOBSON, 1906: 311 (E Siberia, Russia). Distribution: E Siberia, Russia, Japan, China (CONG & YU 1997).

Donacia (*Donacia*) *fukiensis* GOECKE, 1944: 9 (China). Distribution: E Siberia, China, Japan (GRESSITT & KIMOTO 1961, CONG & YU 1997).

Donacia (*Donacia*) *humilis* WEISE, 1912: 76 (E China). Distribution: E China (GRESSITT & KIMOTO 1961).

Donacia (*Donacia*) *mediohirsuta* CHEN, 1966: 145 (Yünnan, China). Distribution: China (CHEN 1966, BOROWIEC 1984).

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Donacia (*Donacia*) *vulgaris* ZSCHACH, 1788: 430 (Europe). Distribution: Europe, Siberia, NW China. Host plants: *Typha latifolia* L., *T. angustifolia* L., *Sparganium* spp. (BOROWIEC 1984).

Donacia (*Cyphogaster*) *lenzi* SCHÖNFELDT, 1888: 33 (Japan). Distribution: Japan, Korea, E China, Taiwan (BOROWIEC 1984, CHEN 1966). Host plants: *Nelumbo nucifera* GAERTN., *Nymphaea tetragona* GEORGI (BOROWIEC 1984).

Donacia (*Cyphogaster*) *provosti* FAIRMAIRE, 1885: 64 (NE China). Distribution: E Siberia, China (BOROWIEC 1984, CHEN 1966), Korea, Japan, Taiwan. Host plants: *Brasenia schreberi*, *Nymphaea tetragona* GEORGI, *Potamogeton* sp. (BOROWIEC 1984).

Donacia (*Cyphogaster*) *tuberfrons* GOECKE, 1934: 221 (SW China). Distribution: SW China (GRESSITT & KIMOTO 1961, CHEN 1966). Material: 1 ex. (NMW): Yünnan, 2 km E of Shizong, 10.IX.2000, leg. J. Bergsten.

Donaciasta FAIRMAIRE, 1901

Donaciasta assama (GOECKE, 1936: 224) (China). Distribution: China (Yünnan), North Vietnam. (BOROWIEC 1984).

Prodonacia shishona (CHEN, 1966: 144) (synonymized by ASKEVOLD 1990).
Donacia vietnamensis KIMOTO & GRESSITT, 1979: 202 (synonymized by BOROWIEC 1984).

Macroplea SAMOUELLE, 1819

Macroplea piligera WEISE, 1889: 576 (Gansu, China). Distribution: China (GRESSITT & KIMOTO 1961, BOROWIEC 1984).

Plateumaris THOMSON, 1859

Plateumaris socia CHEN, 1941: 9 (E China). Distribution: E China. (BOROWIEC 1984).

Sominella JACOBSON, 1908

Sominella macrocnemia FISCHER VON WALDHEIM, 1824: 235 (E Siberia). Distribution: E Siberia, NE China (GRESSITT & KIMOTO 1961). BOROWIEC (1984) does not mention this species as known from China.

Sominella longicornis JACOBY, 1890: 84 (China). Lectotype was designated by ASKEVOLD (1990). Distribution: C and SE China (BOROWIEC 1984).

Chrysomelinae

Prasocuris LATREILLE, 1802

Prasocuris phellandrii (LINNAEUS, 1758: 376) (Europe). Distribution: Europe, Northern Asia, North America, China (GRESSITT & KIMOTO 1961).

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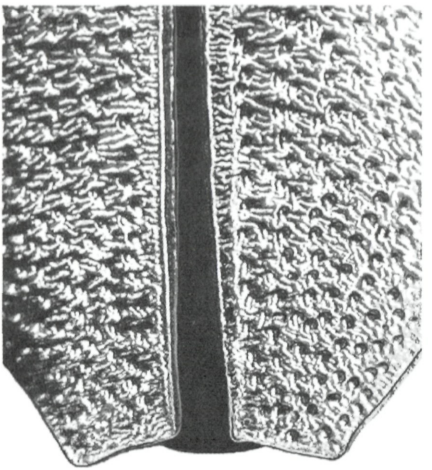
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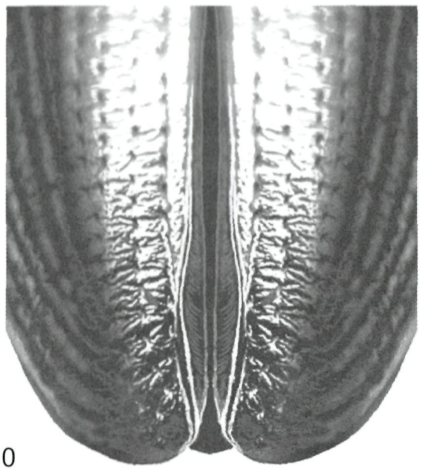
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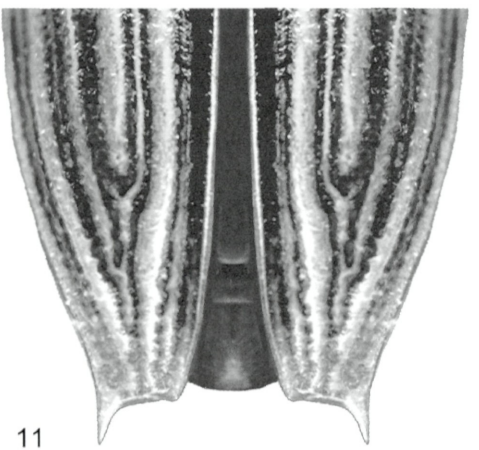
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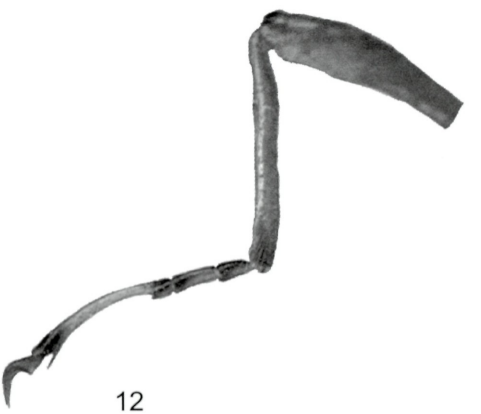
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Figs. 9 - 11: Elytral apices: 9) *Donacia vulgaris*; 10) *Plateumaris sericea*; 11) *Macroplea mutica*.
Fig. 12: Hind leg of *Macroplea mutica*.

Galerucinae

Galerucella CROTCH, 1873

Galerucella nymphaea (LINNAEUS, 1758: 376). Distribution: Europe, Central Asia, Mongolia, North America, China (GRESSITT & KIMOTO 1963).

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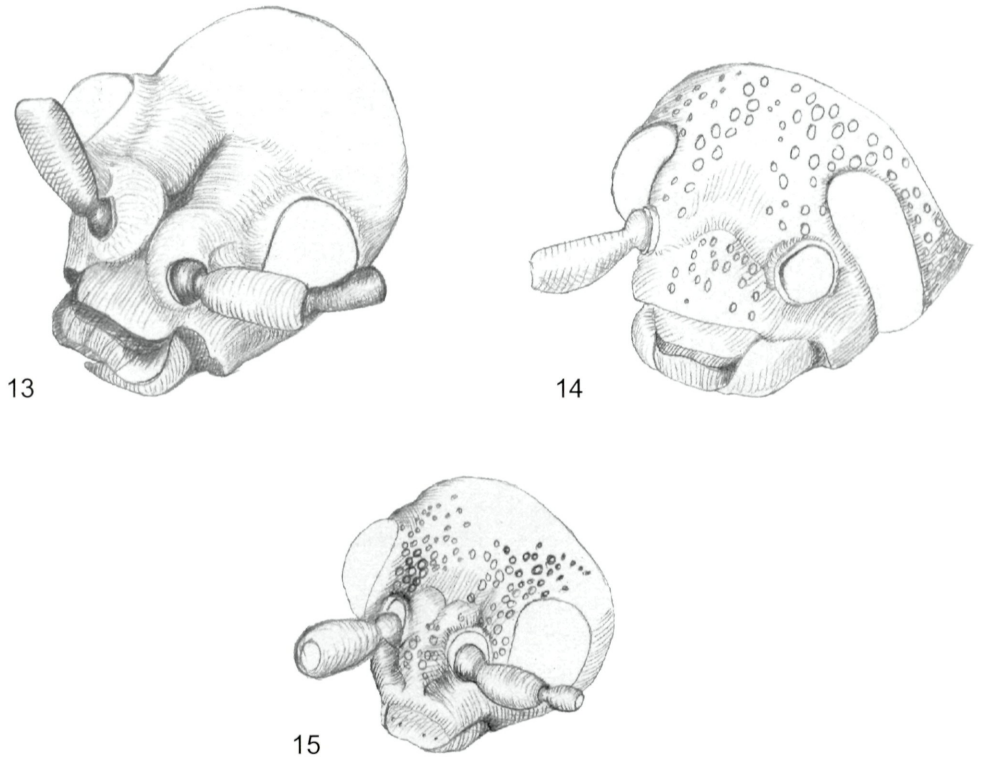

Figs. 13 - 15: Head of 13) *Donaciella clavipes*; 14) *Prasocuris phellandrii*; 15) *Agasicles hydrophila*.

Agasicles JACOBY, 1905

Agasicles hydrophila SELMAN & VOGT, 1971: 1018 (Argentina). Distribution: Argentina, introduced to USA and China (VOGT et al. 1979, JULIEN 1992). Host plants: *Alternanthera philoxeroides* (MARTIUS) GRISEBACH (alligator weed) (JULIEN 1992). Material: 2 exs. (1 NMW, 1 USNM): CWBS loc. 348.

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