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## An annotated list of Dytiscidae (Coleoptera) recorded from Taiwan

With 2 figures

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### Abstract

Based on the study of literature records and recent collections an up-dated check list including 58 species is presented for the island of Taiwan. At least four of the literature records need further confirmation before acceptance. For each species is given original citation, synonyms, literature records from Taiwan, and gross distributions. Locality data is given for the 13 species here reported from Taiwan for the first time. *Bidessus gentilis* SHARP, 1890, is considered a junior synonym of *Pseuduvarus vitticollis* (BOHEMAN, 1848) syn. n., here reported from the Oriental Region for the first time. The following genera are recorded from Taiwan for the first time: *Allopachria*, *Pseuduvarus*, *Leiodytes*, *Nebrioporus*, and *Neptosternus*.

### Zusammenfassung

Auf der Grundlage des Literaturstudiums und der vorhandenen Sammlungen wird eine annotierte Liste von 58 Arten Taiwans vorgestellt. Für jede Art werden das Originalzitat, die Synonyme, Literaturangaben von Taiwan und die Gesamtverbreitung geboten. Fundortdaten aus Taiwan sind für 13 Arten aufgeführt. *Bidessus gentilis* SHARP 1890 ist als Synonym von *Pseuduvarus vitticollis* (BOHEMAN, 1848) festgestellt, hier erstmalig aus der orientalischen Region gemeldet. Erstmalig werden die Gattungen *Allopachria*, *Pseuduvarus*, *Leiodytes*, *Nebrioporus*, und *Neptosternus* von Taiwan genannt.

### Introduction

The water-beetle fauna of large parts of Asia is still very poorly known. In the Far East, the faunas of Japan and Russia are probably those that are best known (LAFER, 1989; MORI & KITAYAMA, 1993; NILSSON & KHOLIN, 1994). On the other hand, our knowledge of the faunas

of Southeast Asia and China is still largely due to RÉGIMBART's (1899) monography, although modern revisions now exist for a few genera like *Lacconectus*, *Hydrovatus*, *Hyphydrus*, *Platambus* and *Laccophilus* (BISTRÖM, 1982, 1995; BRANCUCCI, 1983, 1986, 1988).

Taiwan (earlier Formosa) is an island 150 km east of mainland China, from which it is separated by the relatively shallow Taiwan Strait. It is part of the chain of volcanic archipelagoes extending from the Kamchatka Peninsula in the north to the Sunda Islands in the south. The

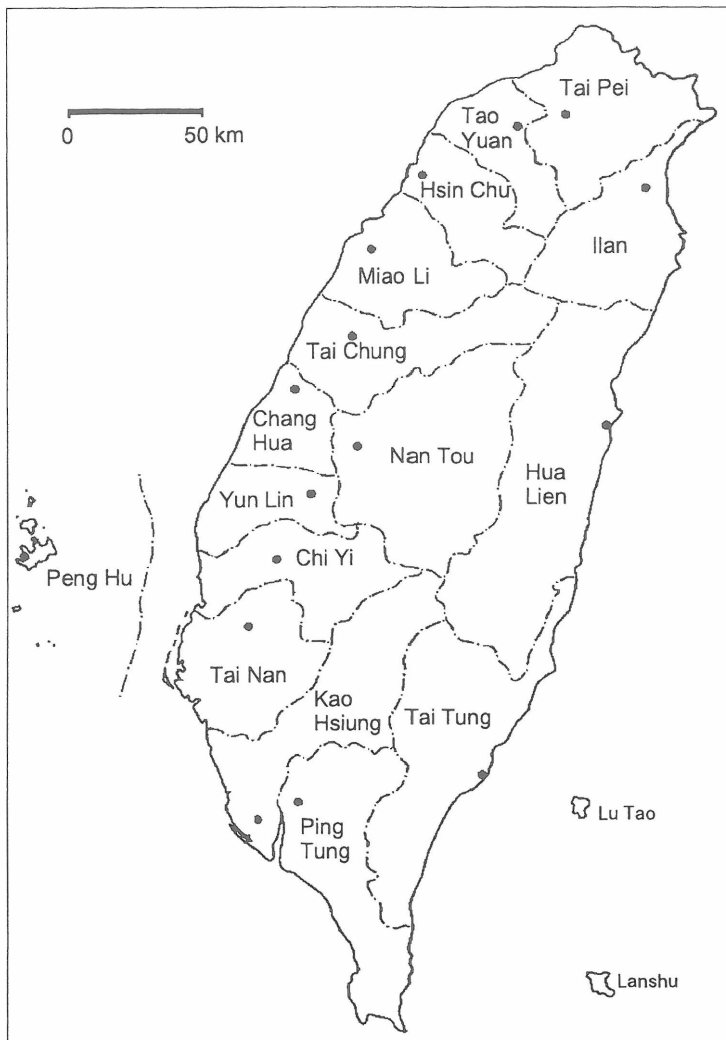


Fig. 1. Map of Taiwan with delimitation of administrative districts or counties. Black dots show position of county capitals. Redrawn from Hsieh (1964).

position of Taiwan is halfway between Shanghai and Hong Kong, and midway between Japan and the Philippines. Latitudinally, it lies between 21°45' and 25°38'N and the Tropic of Cancer divides it into tropical and semitropical regions.

Taiwan is about 160 km broad and 380 km long. It is probably of Miocene age and formed a part of the China mainland during early geological periods. Not until the Pleistocene epoch, when the Strait sank and formed a rift valley, was Taiwan separated from the continent and isolated as an island.

About 60 % of Taiwan is mountainous with over 100 mountains higher than 3,000 m. Plains and basins cover 24 %, and hills and tablelands 12 % of the island's area. The island has five general climatic regions: tropical monsoon, subtropical, temperate, monsoon, and continental humid regions. Taiwan is surrounded by some smaller islands like Lanshu (= Koto-sho). The geography of Taiwan was treated in a monograph by HSIEH (1964). The delimitation of counties is shown in Fig. 1.

RÉGIMBART (1899) gave explicit records from Taiwan of only eight species of Dytiscidae, whereas MIWA's (1931a) catalogue of Taiwanese Coleoptera includes 20 species. With the additions of all subsequent literature records and the collectings made recently by L.J. WANG and colleagues, 58 species of Dytiscidae are now known from Taiwan.

## Materials and methods

The following list is based on a combination of literature records and the examination of a large number of specimens. Besides the study of material in several private and museum collections, many records originate from the recent collectings performed by L.J. WANG and his colleagues at the National Taiwan University, Taipei. A part of this material is now deposited in the collections of A.N. NILSSON and G. WEWALKA. The following list includes all species of Dytiscidae so far recorded from Taiwan. For each species are listed the known synonyms with references to all literature records from Taiwan. New locality data is only presented for the species here recorded from Taiwan for the first time.

### Subfamily Copelatinae

#### *Lacconectus formosanus* (KAMIYA, 1938)

*Platynectes formosanus* KAMIYA, 1938a:30 (orig. descr., Koshun, Taiheizan, Shinten), 1938b:71 (Taiwan).

*Lacconectus formosanus* (KAMIYA, 1938): BRANCUCCI, 1986:124 (4 locs.).

This species was first described from Taiwan, and later also recorded from South China and Vietnam (BRANCUCCI, 1986).

#### *Lacconectus basalis* SHARP, 1882

*Lacconectus basalis* SHARP, 1882:598 (orig. descr.); BRANCUCCI, 1986:126 (Koshun).

This species is widespread in Southeast Asia. It was first recorded from Taiwan by BRANCUCCI (1986).

***Copelatus andamanicus* RÉGIMBART, 1899**

*Copelatus andamanicus* RÉGIMBART, 1899:302 (orig. descr.); SATÔ, 1990a:81 (syn., Tasi-tie-ku near Liukuei).

*Copelatus subfasciatus* ZIMMERMANN, 1919a:76 (orig. descr., Akau, Anping); MIWA, 1931aa:17 (Akau, Anping); KAMIYA, 1932a:14 (Formosa), 1934:1 (Taiwan), 1938a:27 (Kotosho), 1938b:66 (Taiwan); SEKI, 1944:91 (Wankyo near Kagi).

*Copelatus sociennus ryukyuensis* SATÔ, 1961a:8 (orig. descr.).

*Copelatus tokaraensis* NAKANE, 1963:25 (orig. descr.).

This species is known from the Andaman Islands, Borneo, Taiwan and Japan (SATÔ, 1985). It was described from Taiwan as *C. subfasciatus* by ZIMMERMANN (1919a).

***Copelatus japonicus* SHARP, 1884**

*Copelatus japonicus* SHARP, 1884:445 (orig. descr.).

*Copelatus chinensis* RÉGIMBART, 1899:298 (orig. descr.).

*Copelatus collocallosus* FALKENSTRÖM, 1932:192 (orig. descr.).

This species was previously known from Japan, Quelpart Island and South China (SATÔ, 1985). New record from Taiwan: Taipei, Mt. Yangming 11.viii.1992 leg. L.J. WANG.

***Copelatus sociennus* J.BALFOUR-BROWNE, 1952**

*Copelatus sociennus* J.BALFOUR-BROWNE in GUIGNOT, 1952:26 (orig. descr.); YANO et al., 1983:107 (Kaohsiung Hsien).

This species was described from Hong Kong and later recorded also from Nepal and Taiwan (YANO et al., 1983).

***Copelatus tenebrosus* RÉGIMBART, 1880**

*Copelatus tenebrosus* RÉGIMBART, 1880:210 (orig. descr.); YANO et al., 1983:107 (Chiatou); SATÔ, 1985:62 (Taiwan).

*Copelatus pusillus* SHARP, 1882:580 (orig. descr.).

*Copelatus hisamatsui* SATÔ, 1961a:8 (orig. descr.).

This species is widespread in Southeast Asia north to the Ryukyu Islands (SATÔ, 1985). It was first recorded from Taiwan by YANO et al. (1983).

**Subfamily Hydroporinae**

***Hydrovatus acuminatus* MOTSCHULSKY, 1859**

*Hydrovatus acuminatus* MOTSCHULSKY, 1859:42 (orig. descr.); SHARP, 1882:326 (Formosa); RÉGIMBART, 1899:236 (Formose); MIWA, 1931aa:16 (Taihoku); KAMIYA, 1932a:12 (Formosa), 1934:1 (Taiwan); 1938a:9 (Taihoku, Kisan), 1938b:32 (Taiwan); TAKIZAWA, 1933:166 (Koshun); WEWALKA, 1982:116 (Taiwan); YANO et al., 1983:109 (Hsinhua, Kueijen, Chiatou); BISTRÖM, 1995:? (syn., Anping).

*Hydrovatus acuminatus furvus* GUIGNOT, 1950:25 (orig. descr.).

*Hydrovatus obscurus* MOTSCHULSKY, 1859:43 (orig. descr.).

*Hydroporus badius* CLARK, 1863:424 (orig. descr.).

*Hydroporus malaccae* CLARK, 1863:425 (orig. descr.).

*Hydrovatus consanguineus* RÉGIMBART, 1880:212 (orig. descr.).  
*Hydrovatus sordidus* SHARP, 1882:327 (orig. descr.).  
*Hydrovatus humilis* SHARP, 1882:327 (orig. descr.).  
*Hydrovatus affinis* RÉGIMBART, 1895:108 (orig. descr.).  
*Hydrovatus obscurus* RÉGIMBART, 1895:108 (orig. descr.).  
*Hydrovatus ferrugineus* ZIMMERMANN, 1919b:127 (repl. name).

This species is widespread in the Old World tropics and enters also the South Palearctic (BISTRÖM, 1995). It was first recorded from Taiwan by SHARP (1882).

***Hydrovatus seminarius* MOTSCHULSKY, 1859**

*Hydrovatus seminarius* MOTSCHULSKY, 1859:42 (orig. descr.); BISTRÖM, 1995:? (syn.).  
*Hydrovatus fuscus* SHARP, 1882:326 (orig. descr., Formosa); RÉGIMBART, 1899:234 (Formose); WEWALKA, 1982:117 (Formosa).  
*Hydrovatus tinctus* SHARP, 1882:328 (orig. descr.).  
*Hydrovatus matsuii* NAKANE, 1990:198 (orig. descr.).

This species occurs throughout the Oriental Region (BISTRÖM, 1995). It was described from Taiwan as *H. fuscus* by SHARP (1882).

***Hydrovatus bonvouloiri* SHARP, 1882**

*Hydrovatus bonvouloiri* SHARP, 1882:335 (orig. descr.): SATÔ & BRANCUCCI, 1984:2 (syn., Taiwan); BISTRÖM, 1995:? (descr.).  
*Hydrovatus lochooensis* KAMIYA, 1938a:5 (orig. descr.).

This widespread species is known from India to Java and north to Japan (BISTRÖM, 1995). It was first recorded from Taiwan by SATÔ & BRANCUCCI (1984).

***Hydrovatus subtilis* SHARP, 1882**

*Hydrovatus subtilis* SHARP, 1882:329 (orig. descr.); LEE et al., 1992:47 (Taiwan); BISTRÖM, 1995:? (descr.).  
*Hydrovatus adachii* KAMIYA, 1932b:4 (orig. descr.).

Verified records of this species are known from the Andaman Islands, Thailand, Laos and Indonesia (BISTRÖM, 1995). LEE et al. (1992) included Taiwan in the distribution, here verified: Nantou, Kuoshing 10.ix.1992 leg. L.J. WANG.

***Microdytes taiwanus* SATÔ, 1990**

*Microdytes taiwanus* SATÔ, 1990b:101 (orig. descr., Ping-tung Hsien).

This species was described from Taiwan, and no other records are known.

***Microdytes uenoi* SATÔ, 1972**

*Microdytes uenoi* SATÔ, 1972:49 (orig. descr.).

This species was described from the Ryukyu Islands. New record from Taiwan: Nanao, Mystery Lake 13.viii.1992 leg. L.J. WANG.

***Allopachria wangi* WEWALKA & NILSSON, 1994**

*Allopachria wangi* WEWALKA & NILSSON in NILSSON & WEWALKA, 1994:99 (orig. descr.).

This species was described from Taiwan, and no other records are known.

***Herophydrus rufus* (CLARK, 1863)**

*Herophydrus rufus* CLARK, 1863:423 (orig. descr.).

*Hyphoporus rotundatus* GSCHWENDTNER, 1931a:21 (orig. descr., Koto sho); MIWA, 1931a:17 (Kôtôsho), 1931b (type data); KAMIYA, 1932a:13 (Formosa), 1934:1 (Kotosho), 1938a:18 (Kotosho), 1938b:48 (Taiwan); TAKIZAWA, 1933:172 (Kotosho).

*Herophydrus rufus* (CLARK, 1863): SATÔ & BRANCUCCI, 1984:2 (syn.).

This species is widespread in Southeast Asia north to the Ryukyu Islands (SATÔ & BRANCUCCI, 1984). It was described from Lanshu as *Hyphoporus rotundatus* by GSCHWENDTNER (1931a). We have seen specimens also from the main island: Mliaoli, Tunghisiao, Tunghisiao 16.v.1994, leg. L.J. WANG.

***Hyphydrus lyratus* SWARTZ, 1808**

*Hyphydrus lyratus* SWARTZ in SCHÖNHERR, 1808:29 (orig. descr.); SHARP, 1882:383 (Formosa); RÉGIMBART, 1899:207 (Formose); MIWA, 1931a:17 (Kwarenkô, Kôshun); KAMIYA, 1932a:12 (Formosa), 1934:1 (Taiwan); 1938a:13 (5 locs.), 1938b:37 (Taiwan); TAKIZAWA, 1933:168 (Koshun, Taichu); YANO et al., 1983:109 (Chiatou).

*Hyphydrus lyratus lyratus* SWARTZ, 1808: BISTRÖM, 1982:22 (syn., Allping).

*Hyphydrus nigronotatus* CLARK, 1863:421 (orig. descr.).

*Hyphydrus bisulcatus* CLARK, 1863:422 (orig. descr.).

*Hydroporus fossulipennis* MACLEAY, 1871:122 (orig. descr.).

This species occurs throughout the Oriental Region and also in Australia. The subspecies *H. l. lyratus* is widespread in Southeast Asia from China to Australia (BISTRÖM, 1982). It was first recorded from Taiwan by SHARP (1882).

***Hyphydrus japonicus* SHARP, 1873**

*Hyphydrus japonicus* SHARP, 1873:54 (orig. descr.); ZIMMERMANN, 1919a:76 (Pilam); MIWA, 1931a:17 (Pilam, Shôkei); KAMIYA, 1932a:12 (Formosa), 1938a:12 (Nichigetsutan, Musha, Koshun), 1938b:36 (Taiwan); BISTRÖM, 1982:44 (syn., records from Taiwan doubtful and probably referring to *H. orientalis*).

*Hyphydrus frontalis* SHARP, 1882:381 (orig. descr.).

*Hyphydrus paromoeus* GUIGNOT, 1954:40 (orig. descr.).

BISTRÖM (1982) recognized two subspecies: *H. j. japonicus* in Japan and South Korea, and *H. j. vagus* BRINCK in mainland China. Moreover, he considered the literature records from Taiwan as doubtful. We have not seen any specimens of *H. japonicus* from Taiwan.

***Hyphydrus orientalis* CLARK, 1863**

*Hyphydrus orientalis* CLARK, 1863:419 (orig. descr.); SHARP, 1882:382 (Formosa); MIWA, 1931a:17 (Horisha); KAMIYA, 1932a:12 (Formosa), 1934:1 (Taiwan); 1938a:13 (Formosa vide SHARP), 1938b:38 (Taiwan); TAKIZAWA, 1933:168 (Koshun); BISTRÖM, 1982:47 (syn., Taipeh, ?Anping).

*Hyphydrus eximius* CLARK, 1863:421 (orig. descr.).

This species is known from China, Taiwan and Vietnam, and the literature records from Japan and Korea were considered doubtful by BISTRÖM (1982). It was first recorded from Taiwan by SHARP (1882).

***Hyphydrus pulchellus* CLARK, 1863**

*Hyphydrus pulchellus* CLARK, 1863:420 (orig. descr.); SATÔ, 1961a:7 (Formosa); BISTRÖM, 1982:95 (syn.).

*Hyphydrus orbicularis* RÉGIMBART, 1899:212 (orig. descr.).

*Hyphydrus wui* GSCHWENDTNER, 1933:161 (orig. descr.).

*Hyphydrus jeanelli* GUIGNOT, 1934:269 (orig. descr.).

This species is known from Japan to Burma and Vietnam (BISTRÖM, 1982). It was recorded from Taiwan by SATÔ (1961a).

***Pseuduvarus vitticollis* (BOHEMAN, 1848)**

*Hydroporus vitticollis* BOHEMAN, 1848:256 (orig. descr.); BISTRÖM, 1988:10 (syn.).

*Bidessus gentilis* SHARP, 1890:344 (orig. descr.) n. syn.

When BISTRÖM (1988) proposed the monobasic genus *Pseuduvarus* for *P. vitticollis*, its geographical range was supposed to include only Africa and Madagascar. However, the comparison of African specimens with syntypes of *Bidessus gentilis* (coll. SHARP, Natural History Museum, London) has convinced us that they are conspecific. This new synonymy expands the range of *P. vitticollis* to the Oriental Region, where it is known from Sri Lanka, India, Pakistan and Malaysia (VAZIRANI, 1977). New record from Taiwan: Taitung, Luyeh 14.ix.1992 leg. L.J. WANG.

***Hydroglyphus flammulatus* (SHARP, 1882)**

*Bidessus flammulatus* SHARP, 1882:359 (orig. descr.).

*Bidessus antennatus* RÉGIMBART, 1892:118 (orig. descr.); ZIMMERMANN, 1919a:76 (Anping); MIWA, 1931a:17 (Anping); KAMIYA, 1932a:12 (Formosa), 1934:1 (Taiwan), 1938a:15 (Takesaki), 1938b:41 (Taiwan); TAKIZAWA, 1933:170 (Anping); SEKI, 1944:91 (Wankyo near Kagi).

*Guignotus flammulatus* (SHARP, 1882): VAZIRANI, 1968:315 (penis dep.).

*Hydroglyphus flammulatus* (SHARP, 1882): YANO et al., 1983:108 (10 locs).

This species is widespread in the Oriental Region where it occurs from India to Indonesia and north to Japan (VAZIRANI, 1977). It was first recorded from Taiwan by ZIMMERMANN (1919a).

***Hydroglyphus inconstans* (RÉGIMBART, 1892)**

*Bidessus inconstans* RÉGIMBART, 1892:119 (orig. descr.).

*Guignotus inconstans* (RÉGIMBART, 1892): ABE, 1989:2 (descr., distr.).

*Hydroporus intermixtus* WALKER, 1858: RÉGIMBART, 1899:227 (misident.).

This widespread Oriental species occurs from India and Sri Lanka to Sumatra and north to the Ryukyu Islands (VAZIRANI, 1977; ABE, 1989). New record from Taiwan: Taipei, Gongliao, Gongliao 12.ix.1992 leg. L.J. WANG.

***Hydroglyphus amamiensis* (SATÔ, 1961)**

*Bidessus japonicus* SHARP, 1873: MIWA, 1932:145 (Formosa); TAKIZAWA, 1933:170 (Tarowan); KAMIYA, 1934:1 (Taiwan), 1938a:16 (Baikui, Koshun), 1938b:43 (Taiwan).

*Guignotus japonicus* (SHARP, 1873): SATÔ, 1983:164 (in part, syn.).

*Hydroglyphus japonicus* (SHARP, 1873): YANO et al., 1983:108 (10 locs).

*Guignotus japonicus amamiensis* SATÔ, 1961a:7 (orig. descr.).

This species belongs to a complex of forms of uncertain taxonomic status. The complex is widespread in the Far East north to Primorye. Based on the partly sympatric presence of males with two different penis shapes in Korea and Japan (cf. SATÔ, 1961a), we have chosen to recognize *Hydroglyphus amamiensis* as a valid species and not as a subspecies of *H. japonicus*. It was first recorded from Taiwan by MIWA (1932).

***Liodesus megacephalus* (GSCHWENDTNER, 1931)**

*Bidessus megacephalus* GSCHWENDTNER, 1931a:21 (orig. descr., Koto sho); MIWA, 1931a:17 (Kôtôsho), 1931b:92 (type data); KAMIYA, 1932a:13 (Formosa), 1934:1 (Kotosho), 1938a:16 (Kotosho, Hookoto), 1938b:44 (Taiwan); TAKIZAWA, 1933:170 (Kotosho); SATÔ 1964:61 (syn.).

*Bidessus maculosus* GSCHWENDTNER, 1931b:462 (orig. descr.).

*Bidessus tokunagai* KAMIYA, 1932b:5 (orig. descr.).

This species was first described from Lanshu. It occurs also in China and Japan (SATÔ, 1964).

**[*Leiodytes frontalis* (SHARP, 1884)]**

*Bidessus frontalis* SHARP, 1884:440 (orig. descr.); KANO, 1931:177 (Kôtôsho).

*Leiodytes frontalis* (SHARP, 1884): BISTRÖM, 1988:27 (cat.).

This species is widespread in Japan (MORI & KITAYAMA, 1993). KANO's (1931) record from Lanshu needs confirmation.

***Leiodytes perforatus* (SHARP, 1882)**

*Bidessus perforatus* SHARP, 1882:363 (orig. descr.).

*Clypeodytes perforatus* (SHARP, 1882): VAZIRANI, 1977:41 (cat.).

This species is known from China and Vietnam (VAZIRANI, 1977). As indicated by BISTRÖM (1988) and here confirmed it belongs to *Leiodytes* and not *Clypeodytes* as adopted by previous authors. New record from Taiwan: Taipei, Gongliano, Gongliano 12.xi.1992 leg. L.J. WANG.

***Neonectes babai* SATÔ, 1990**

*Neonectes babai* SATÔ, 1990b:102 (orig. descr., Liu-kuei, Tai-tung Hsien).

This species was described from Taiwan. An additional record is from: Taoyuan, Paling. 15.vi.1991, leg. C.F. LEE.

***Nebrioporus hostilis* (SHARP, 1884)**

*Deronectes hostilis* SHARP, 1884:448 (orig. descr.).

This species was previously known from Primorye and Kyushu. New records from Taiwan:



Taichung Hsien, Wuling 27.iii.1989 leg. Wong Kwok Ching; Hwalien Hsien, Fuhyuan 22.viii.1989; Taoguan Hsien, Paling 14.vi.1991 leg. M.L. JANG (in coll. WEWALKA).

### Subfamily Colymbetinae

#### *Platynectes babai* SATÔ, 1982

*Platynectes dissimilis* SHARP, 1873: KAMIYA, 1938a:29 (4 locs.), 1938b:70 (Taiwan).  
*Platynectes babai* SATÔ, 1982:3 (orig. descr., Naka-Onsen).

This species was described from Taiwan, and no records are known from outside this island. It was first recorded from Taiwan by KAMIYA (1938a) as *P. dissimilis*.

#### *Platynectes dissimilis* SHARP, 1873

*Platynectes dissimilis* SHARP, 1873:50 (orig. descr.); SATÔ, 1982:3 (records from Taiwan represent *P. babai*).  
*Platynectes semperi* RÉGIMBART, 1899: KAMIYA, 1932a:14 (Formosa, misident.).  
*Platynectes decempunctatus* var. *semperi* RÉGIMBART, 1899: MIWA, 1931a:18 (Arisan, Kwarenkô, misident.); KAMIYA, 1934:5 (Taiwan).

This species was earlier mixed up with *P. babai*. The true *P. dissimilis* is known from Burma, China, and maybe also India (VAZIRANI, 1977). Verified record from Taiwan: Taipei, Gongliao, Hermei 22.vii.1992 leg. M.L. JENG.

#### *Platambus pictipennis* SHARP, 1873

*Platambus pictipennis* SHARP, 1873:49 (orig. descr.); BRANCUCCI, 1988:186 (Kôtôsho).  
This species is confined to Sakhalin, Japan and the island of Lanshu (BRANCUCCI, 1988). The record from Lanshu is somewhat unexpected.

#### *Agabus japonicus* SHARP, 1873

*Agabus japonicus* SHARP, 1873:50 (orig. descr.); RÉGIMBART, 1899:279 (Formose); MIWA, 1931a:18 (Takao, Kammon); KAMIYA 1932a:15 (Formosa), 1938a:35 (4 locs.); KAMIYA, 1938a:29 (4 locs.), 1938b:80 (Taiwan).

This species was described from Japan, and it occurs at least also in Sakhalin, Korea and China. It was first recorded from Taiwan by RÉGIMBART (1899). We have compared Taiwan specimens with syntypes (coll. SHARP, Natural History Museum, London), and found them identical.

#### *Agabus ezo* NAKANE, 1989

*Agabus ezo* NAKANE, 1989:23 (orig. descr.).

The *Agabus japonicus* group of species needs to be revised. NAKANE (1989) described *A. ezo* as a subspecies of *A. japonicus* from Mt. Daisetsu in Hokkaido. We suggest that *A. ezo* is given species rank, chiefly due to the penis that is more strongly dilated in distal half than in the other forms assigned to *A. japonicus*. After the comparison with paratypes, we have applied this name to two females from Ilan, Tsuifeng Lake on Taiwan (4.iv.1987 leg. M.L. JENG). The study of males from Taiwan will be necessary to confirm our conclusion.

***Agabus fulvipennis* RÉGIMBART, 1899**

*Agabus fulvipennis* RÉGIMBART, 1899:277 (orig. descr.).

*Gaurodytes chinensis* ZIMMERMANN, 1919b:211 (orig. descr.).

The Chinese species of the *A. japonicus*-group are more or less impossible to identify in the absence of a modern revision. We have followed FENG (1933) in the synonymy given above. New record from Taiwan: Taitung, Tientsu 10.viii.1989 leg. M.L. JENG & KAOHSUNG, Tien-chu 31.x.1992 leg. M.L. JENG.

***Agabus hummeli* (FALKENSTRÖM, 1936)**

*Gaurodytes hummeli* FALKENSTRÖM, 1936:2 (orig. descr.).

This species was described from Sichuan. The holotype was found identical with the following specimens from Taiwan: Ilan, Tsuifeng Lake 4.iv.1987 leg. M.L. JENG. It was also collected in Sungro Lake, Ilan, 21.vii.1994, leg. L.J. WANG.

***Agabus taiwanensis* NILSSON & WEWALKA, 1994**

*Agabus taiwanensis* NILSSON & WEWALKA, 1994:993 (orig. descr.).

This species was described from Taiwan, and no other records are known.

***Rhantus suturalis* (MACLEAY, 1825)**

*Colymbetes suturalis* MACLEAY, 1825:31 (orig. descr.).

*Colymbetes pulverosus* STEPHENS, 1828:69 (orig. descr.).

*Rhantus pulverosus* (STEPHENS, 1828): MIWA, 1932:145 (4 Taiwan locs.); KAMIYA, 1938a:43 (Taihoku, Hori), 1938b:93 (Taiwan); SATÔ, 1961a:9 (Formosa).

This species is widely distributed in the Palearctic, Oriental and Australian Regions. It was first recorded from Taiwan by MIWA (1932).

***Rhantus formosanus* KAMIYA, 1938**

*Rhantus formosanus* KAMIYA, 1938a:42 (orig. descr., Sankakuho), 1938b:92 (Taiwan).

*Rhantus erraticus* SHARP, 1884: MIWA, 1932:145 (Musha, misident).

This species was described from Taiwan. It was long known only from the type series that was destroyed during World War Two (M. BALKE in litt.). Additional records are from: Nantou, Tzuchung, 24.iv.1993, leg. M.L. JENG; Tartarta & Tzuchung, 24.ix.1994, leg. L.J. WANG. Most likely, MIWA's (1932) record of *R. erraticus* from Musha (now Wushe, in same village as Sankakuho) also represent *R. formosanus*.

Subfamily **Laccophilinae**

***Neptosternus* sp.**

Besides the many African species, the genus *Neptosternus* includes 19 described species in East Asia (HOLMEN & VAZIRANI 1990), and a high number of undescribed species have been col-

lected (M. BALKE i. l.). In the absence of a modern revision it is impossible to identify the single female known from Taiwan: Taipei, Gongliao, Gongliao 3.vii.1992 leg. L.J. WANG (Fig. 2).

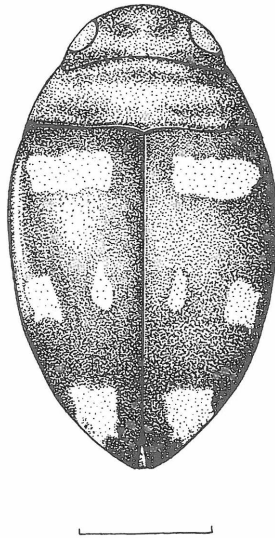


Fig. 2. Dorsal habitus (appendages excluded) of *Neptosternus* female from Gongliao Nanya in Taiwan. Scale bar 1 mm. Del. G. MARKLUND.

***Laccophilus siamensis* SHARP, 1882**

*Laccophilus siamensis* SHARP, 1882:306 (orig. descr.); YANO et al., 1983:110 (Chiatou).

*Laccophilus assimilis* RÉGIMBART, 1883:226.

*Laccophilus siamensis taiwanensis* BRANCUCCI, 1983:302 (orig. descr., syn., Kaohsiung, Anping).

This polymorphic species is distributed over most of the Oriental Region. BRANCUCCI (1983) recognized four different subspecies, of which *L. s. taiwanensis* is confined to mainland China and Taiwan.

***Laccophilus flexuosus* AUBÉ, 1838**

*Laccophilus flexuosus* AUBÉ, 1838:430 (orig. descr); SHARP, 1882:310 (Formosa); BRANCUCCI, 1983:320 (syn., Anping).

*Laccophilus solutus* SHARP, 1882:315 (orig. descr.).

*Laccophilus cognatus* SHARP, 1882:316 (orig. descr.).

*Laccophilus chloroticus* RÉGIMBART, 1887:267 (orig. descr.).

*Laccophilus formosanus* TAKIZAWA, 1932:22 (orig. descr., Formosa); KAMIYA, 1934:1 (Taiwan).

This widespread species is known from India and Nepal to Vietnam and north to Japan (BRANCUCCI, 1983). It was first recorded from Taiwan by SHARP (1882).

***Laccophilus chinensis* BOHEMAN, 1858**

*Laccophilus chinensis* BOHEMAN, 1858:21 (orig. descr.); ZIMMERMANN, 1919a:75 (Kankau Koshun); MIWA, 1931a:16 (4 locs.); TAKIZAWA, 1932:22 (Kotosho); KAMIYA, 1932a:11 (Formosa), 1934:1 (Kotosho); 1938a:6 (6 locs.), 1938b:26 (Taiwan); WEWALKA, 1982:120 (Taiwan); BRANCUCCI, 1983:331 (Kankau Koshun); YANO et al., 1983:109 (Chiatou).

This widespread species is known from India and Nepal to Vietnam and north to Japan (BRANCUCCI, 1983). It was first recorded from Taiwan by ZIMMERMANN (1919a).

***Laccophilus sharpi* RÉGIMBART, 1889**

*Laccophilus sharpi* RÉGIMBART, 1889:151 (orig. descr.); ZIMMERMANN, 1919a:75 (Pilam, Lhihukoki); MIWA, 1931a:16 (6 locs.); TAKIZAWA, 1932:23 (Koshun, Taichu, Taihoku); KAMIYA, 1934:1 (Taiwan); 1938a:7 (10 locs.), 1938b:28 (Taiwan); SATÔ, 1961a:8 (Formosa); BRANCUCCI, 1983:350 (syn., 8 locs); YANO et al., 1983:109 (10 locs).

*Laccophilus similis* RÉGIMBART, 1889:150 (orig. descr.).

*Laccophilus samosir* CSIKI, 1937:125 (orig. descr.).

An extremely widespread species known from Arabia to Australia and northwards to Korea and Japan (BRANCUCCI, 1983). It was first recorded from Taiwan by ZIMMERMANN (1919a).

**Subfamily Dytiscinae**

***Eretes sticticus* (LINNAEUS, 1767)**

*Dytiscus sticticus* LINNAEUS, 1767:666 (orig. descr.).

*Eretes sticticus* (LINNAEUS, 1767): SHARP, 1882:699 (Formosa); RÉGIMBART, 1899:341 (Formose); ZIMMERMANN, 1919a:77 (Anping, Chip Chip, Taihanroku); MIWA, 1931a:18 (Anping, Chip-Chip, Taihanroku); KAMIYA, 1932a:16 (Formosa), 1934:7 (Taiwan), 1938a:47 (5 locs.), 1938b:99 (Taiwan); YANO et al., 1983:107 (6 locs).

This species is more or less cosmopolitan at lower latitudes. In the Far East it occurs north to Hokkaido and South Primorye. It was first recorded from Taiwan by SHARP (1882).

***Hydaticus rhantoides* SHARP, 1882**

*Hydaticus rhantoides* SHARP, 1882:664 (orig. descr., Formosa); YANO et al., 1983:108 (4 locs.); WEWALKA, 1979:128 (syn., Formosa).

*Hydaticus fabricii* (MACLEAY, 1825): MIWA, 1931a:18 (Kôshun); KAMIYA, 1932a:16 (Formosa), 1934:7 (Taiwan), 1938a:49 (Taihoku, Kuraru), 1938b:103 (Taiwan); SATÔ, 1965:126 (Urai).

This species was described from Japan, and SHARP (1882) had also seen specimens from Taiwan. It occurs also in China and Vietnam (WEWALKA, 1979).

***Hydaticus vittatus* (FABRICIUS, 1775)**

*Dytiscus vittatus* FABRICIUS, 1775:825 (orig. descr.).

*Hydaticus vittatus* (FABRICIUS, 1775): WEWALKA, 1975a:87 (syn., Formosa); ? SHARP, 1882:671 (Formosa); ? ZIMMERMANN, 1919a:76 (Anping, Kosempo); ? KANO, 1931:176 (Kôtôsho); ? MIWA, 1931a:18 (Anping, Kôsempo, Hôkotô); ? MIWA et al., 1932:298 (Kôtôsho); ? KAMIYA, 1932a:17 (Formosa), 1934:7 (Taiwan), 1938a:51 (Taihoku, Jitsugetsutan, Kotosho), 1938b:108 (Taiwan).

*Graphoderus lenzi* SCHÖNFELDT, 1890:169 (orig. descr.).

*Hydaticus lenzi conjungens* RÉGIMBART, 1899:329 (orig. descr.); SATÔ, 1961b:59 (Rahau).

The geographical range of this species is as wide as that of *H. satoi*, with which it earlier was confused. As both species occur in Taiwan, earlier literature records of *H. vittatus* need to be revised. The nominate subspecies is widespread and occurs also in Taiwan, whereas *H. v. angustulus* RÉGIMBART is confined to Sri Lanka and South India (WEWALKA, 1975a).

#### *Hydaticus satoi* WEWALKA, 1975

*Hydaticus vittatus* (FABRICIUS, 1775): SATÔ, 1961b:55 (Hori, Rokki).

*Hydaticus satoi* WEWALKA, 1975a:91 (orig. descr., Formosa: Takao).

This species is widespread in the Oriental Region where it is known from India to Borneo and north to Taiwan and Japan (WEWALKA, 1975a). It was previously mixed up with *H. vittatus*.

#### *Hydaticus bowringii* CLARK, 1864

*Hydaticus bowringii* CLARK, 1864:214 (orig. descr.); MIWA, 1932:145 (Shinten); KAMIYA, 1938a:48

(Taihoku), 1938b:102 (Taiwan).

This species was described from China. It is widespread in Japan (MORI & KITAYAMA, 1993). It was first recorded from Taiwan by MIWA (1932).

#### [*Hydaticus luczonicus* AUBÉ, 1838]

*Hydaticus luczonicus* AUBÉ, 1838:175 (orig. descr.); KANO, 1931:177 (Kôtôsho).

This species is widespread in the Oriental Region. It was first described from the Philippines, and KANO'S (1931) record from Lanshu needs confirmation.

#### *Hydaticus pacificus* AUBÉ, 1838

*Dytiscus ruficollis* FABRICIUS, 1787:189 (orig. descr.) (preoccupied by DE GEER, 1774).

*Hydaticus pacificus* AUBÉ, 1838:177 (orig. descr.); KAMIYA, 1938c:64 (Kashô-tô); BALFOUR-BROWNE, 1939:110 (syn.); LEE et al., 1992:53 (Taiwan).

*Hydaticus discindens* WALKER, 1858:204 (orig. descr.).

*Hydaticus pacificus conspersus* RÉGIMBART, 1899:315 (orig. descr.).

This species belongs to a difficult complex of geographical forms of unknown taxonomic status, that is widespread in Southeast Asia. RÉGIMBART (1899) described the var. *conspersus* from Japan, now treated as a valid species by Japanese authors (MORI & KITAYAMA, 1993). NAKANE (1990b) described the subspecies *H. c. sakishimanus* from the Ryukyu Islands. *Hydaticus pacificus* was recorded from Taiwan by KAMIYA (1938c), and we have material from Pingtung, Chielaohui 26.xi.1991 leg. W.I. CHOU. The taxonomic status of this material deserves further study.

#### *Rhantaticus congestus* (KLUG, 1833)

*Hydaticus congestus* KLUG, 1833:136 (orig. descr.).

*Hydaticus signatipennis* LAPORTE, 1834:238 (orig. descr.).

*Rhantaticus signatipennis* (LAPORTE, 1834): RÉGIMBART, 1899:340 (Formose).

*Rhantaticus congestus* (KLUG, 1833): MIWA, 1931a:18 (Anping); KAMIYA, 1932a:17 (Formosa), 1934:8 (Taiwan), 1938a:54 (Taihoku, Hori), 1938b:112 (Taiwan).

This species is distributed from Africa to Australia. It was first recorded from Taiwan by RÉGIMBART (1899).

***Cybister japonicus* SHARP, 1873**

*Cybister japonicus* SHARP, 1873:45 (orig. descr.); SHARP, 1882:748 (Formosa); RÉGIMBART, 1899:348 (Formose); MIWA, 1931a:19 (Kôshun, Taihoku); KAMIYA, 1932a:18 (Formosa), 1934:8 (Taiwan), 1938a:59 (Formosa vide SHARP), 1938b:121 (Taiwan).

This species is distributed from Primorye to China and throughout Japan. It was first recorded from Taiwan by SHARP (1882).

**[*Cybister brevis* AUBÉ, 1838]**

*Cybister brevis* AUBÉ, 1838:98 (orig. descr.); KANO, 1931:177 (Kôtôsho).

This species is widespread in Japan (MORI & KITAYAMA, 1993). KANO's (1931) record from Lanshu needs confirmation.

**[*Cybister ventralis* SHARP, 1882]**

*Cybister ventralis* SHARP, 1882:742 (orig. descr.); KANO, 1931:177 (Kôtôsho).

*Cybister gracilis* SHARP, 1882:743 (orig. descr.).

*Cybister crassus* SHARP, 1882:743 (orig. descr.).

This species is widespread in the Oriental Region. KANO's (1931) record from Lanshu needs confirmation.

***Cybister sugillatus* ERICHSON, 1834**

*Cybister sugillatus* ERICHSON, 1834:227 (orig. descr.); ZIMMERMANN, 1919a:77 (Taihorin); KANO, 1931:176 (Kôtôsho); MIWA, 1931a:19 (Taihōrin); MIWA et al., 1932:298 (Kôtôsho); KAMIYA, 1932a:18 (Formosa), 1934:9 (Taiwan), 1938a:59 (Shinchiku, Kotosho), 1938b:124 (Taiwan).

*Cybister bisignatus* AUBÉ, 1838:88 (orig. descr.).

*Cybister notasicus* AUBÉ, 1838:88 (orig. descr.).

*Cybister olivaceus* BOHEMAN, 1858:21 (orig. descr.).

*Cybister prolixus* SHARP, 1882:718 (orig. descr.).

This species is widespread in the Oriental Region, where it is known from Sri Lanka and India to Indonesia and north to the Ryukyu Islands (WEWALKA, 1975b). It was first recorded from Taiwan by ZIMMERMANN (1919a).

***Cybister limbatus* (FABRICIUS, 1775)**

*Dytiscus limbatus* FABRICIUS, 1775:230 (orig. descr.).

*Cybister limbatus* (FABRICIUS, 1775): SHARP, 1882:740 (Formosa); RÉGIMBART, 1899:342 (Formose); ZIMMERMANN, 1919a:77 (Tainan, Anping); KANO, 1931:176 (Kôtôsho); MIWA, 1931a:19 (Tainan, Anping); MIWA et al., 1932:298 (Kôtôsho); KAMIYA, 1932a:18 (Formosa), 1934:9 (Taiwan), 1938a:59 (Jitsugetsutan, Botanwan), 1938b:124 (Taiwan).

This widespread species is known from India to Vietnam and north to the Ryukyu Islands (VAZIRANI, 1977). It was first recorded from Taiwan by SHARP (1882).

***Cybister rugosus* (MACLEAY, 1825)**

*Dytiscus rugosus* MACLEAY, 1825:136 (orig. descr.).

*Cybister indicus* AUBÉ, 1838:62 (orig. descr.).

This species was previously known from Thailand, Indonesia, Cambodia and Vietnam (VAZIRANI, 1977). New records from Taiwan: Taipei, Mt. Yangming, 1.v.1992; Tunghisiao, Tunghisiao, 16.v.1994, leg. L.J. WANG.

***Cybister tripunctatus* (Olivier, 1795)**

*Dytiscus tripunctatus* OLIVIER, 1795:14 (orig. descr.).

*Cybister tripunctatus* (OLIVIER, 1795): SHARP, 1882:727 (Formosa); MIWA, 1931a:19 (Taihōrin, Tainon).

*Cybister tripunctatus orientalis* GSCHWENDTNER, 1931c:99 (orig. descr.); ZIMMERMANN, 1919a:77 (Taihorin, Tainan); KAMIYA, 1934:9 (Taiwan), 1938a:60 (5 locs.), 1938b:125 (Taiwan); SATÔ, 1961:10 (Formosa); YANO et al., 1983:107 (Chiatou).

*Cybister asiaticus* SHARP, 1882:731 (orig. descr.).

This widespread species ranges over the warmer parts of the Old World. Only selected synonyms are given here. According to BALFOUR-BROWNE (1945), this polymorphic species is in the Oriental Region represented by the subspecies *C. t. asiaticus* SHARP. It was first recorded from Taiwan by SHARP (1882).

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