

[研究文章 Research Article]

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## Notes on Hydradephaga and Hydrophilidae (Insecta: Coleoptera) of the Matsu Islands, including a New Record of *Platynectes dissimilis* (Sharp, 1873) from Taiwan

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**Abstract.** This study reviewed the Hydradephaga and Hydrophilidae of the Matsu Islands in Taiwan. A total of ten species (eight identified species and two unidentified species) from three families were recorded in the Matsu Islands. Among them, *Platynectes dissimilis* (Sharp, 1873) is newly recorded for Taiwan, and four species are newly recorded for the Matsu Islands: *Allodessus megacephalus* (Gschwendtner, 1931), *Dactylosternum* cf. *hydrophiloides* (MacLeay, 1825), *Helochares neglectus* (Hope, 1845), and *Sternolophus rufipes* (Fabricius, 1792). Additionally, based on the photos provided by Wu (2003), we speculate that the Gyrinidae of the Matsu Islands is *Dineutus orientalis* (Modder, 1776).

**Keywords:** fauna, distribution, aquatic insect, offshore island, taxonomy

### Introduction

The Matsu Islands, which belong to Lienchiang County, Taiwan (R.O.C.), comprise eight main islands: Nangan Is., Beigan Is., Gaodeng Is., Liang Is., Dongyin Is., Xiyin Is., Dongyin Is., and Xiyin Is. There are also 28 smaller islands, resulting in a total area of 29.54 km<sup>2</sup>. This island group is in close proximity to southern China, with the nearest distance being only 9 km. However, it is situated 170 km away from the main island of Taiwan.

Following the Chinese Civil War, both the Matsu Islands and the Kinmen Islands became crucial military strongholds for Taiwan from 1949 to 1992, remaining under military control for an extended period. Consequently, there were few entomologists who visited these islands to investigate the insect fauna, especially aquatic insects, which remained largely unknown (Shih et al., 2004). However, noticeable changes began to occur in the 1990s, with the publication of reports on various insect groups, such as mosquitoes, agricultural pests, dragonflies, and butterflies in these regions (Fan & Chang, 1990; Lee, 2000; Fan et al., 2000; Shih et al., 2002; Wu, 2003; Lien, 2004; Hu et al., 2023). The aquatic beetle fauna of the Kinmen Islands has gradually become better known, with eight families identified, including Dytiscidae (23 species), Gyrinidae (1 species), Haliplidae (1 species), Hydraenidae (1 species), Hydrophilidae (15 species), Lampyridae (1 species), Noteridae (1 species), and Scirtidae (1 species) (Fan et al., 2000; Tung et al., 2008; Chang, 2011; 2017; Liu et al., 2021a; Liu et al., 2022). In contrast, research on the aquatic beetle fauna in the Matsu Islands is limited. Currently, only three species have been recorded in the region: *Cybister tripunctatus*, *Eretes griseus* (both Dytiscidae), and an unidentified species of Gyrinidae (Wu, 2003). Therefore, in May 2023, the second and third authors conducted a simple survey on the Matsu Islands, ultimately increasing the known aquatic beetle species to ten.

### Materials and methods

The specimens listed in this report were collected using small water nets and light traps. Male genitalia were dissected from water-relaxed specimens and examined on temporary glycerin slides without cover glasses. After examination, the aedeagus was rinsed in 95% alcohol and mounted in Euparal on a small slide below the respective specimen. In some cases of duplicate specimens, the aedeagus was mounted on the same card as the specimen using water-soluble glue. Male genitalia and morphological characters were examined using a Leica DM750 compound microscope.

The materials examined in this paper are deposited at NMNS (National Museum of Natural Science, Taiwan, curated by Mr. Bao-Cheng Lai) and TARI (Taiwan Agricultural Research Institute, Taiwan, curated by Dr. Chi-Feng Lee).

### Results

#### Family Dytiscidae Leach, 1815

龍蝨科

#### *Allodessus megacephalus* (Gschwendtner, 1931)

大頭豹斑龍蝨

(Fig. 1A)

**Specimens examined.** TAIWAN: 1 ex. Lienchiang, Beigan, Banli beach (坂里沙灘), 26.2157, 119.9764, 26-27.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Distribution.** Taiwan: Taiwan Island, Penghu Islands, and Lanyu Island, with a new record for the Matsu Islands. This species is also recorded in the following regions: Southern China and Japan (from Honshu to the Ryukyu Islands) (Nilsson, 1995; Liu et al., 2020).

*Cybister cf. tripunctatus lateralis* (Fabricius, 1798)  
點刻三線大龍蝨

**Specimens examined.** No specimens were examined.

**Distribution.** Taiwan: Taiwan Island, Kinmen Islands, Matsu Islands, and Penghu Islands (Nilsson et al., 1995; Fan et al., 2000; Wu, 2004; Liu et al., 2020). This species is widely distributed from East Asia to Central Asia (Jiang et al., 2023b).

**Remark.** This species was previously recorded by Wu (2003), but the specimens were not identified to subspecies. While we were unable to examine specimens from Matsu, both Ohba et al. (2020) and Jiang et al. (2023b) have shown that only *Cybister tripunctatus lateralis* (Fabricius, 1798) occurs in Taiwan and Southern China. Therefore, we assume that the report from the Matsu Islands refers to this subspecies.

*Eretes griseus* (Fabricius, 1781)  
灰色龍蝨

**Specimens examined.** No specimens were examined.

**Distribution.** Taiwan: Taiwan Island, Penghu Islands, Matsu Islands, Kinmen Islands, and Lanyu Island (Nilsson et al., 1995; Miwa, 1929; Chang, 1998; Fan et al., 2000; Wu, 2003). This species is widely distributed from East Asia to southern Europe and Africa (Miller, 2002).

*Platynectes dissimilis* (Sharp, 1873)  
暗紋扁形豆龍蝨  
(Fig. 1B–C)

**Specimens examined.** TAIWAN: 1 ♂, 1 ♀. Taiwan, Matsu, Peikan (北竿), 19.VIII.2015, Y.-T. Chung leg. (TARI); 1 ♂, 2 ♀♀. Lienchiang, Beigan, Bishan (壁山), 26.2238, 119.9908, 27.V.2023, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Distribution.** Central and southeastern China (Štátný, 2003; Jiang et al., 2023a). This is the first record for Taiwan (Matsu Islands).

**Remark.** The specimens from the Matsu Islands are very dark in color, resembling *Platynectes chujoi* due to their dark appearance. *Platynectes dissimilis* typically features yellow spots on the elytra in most areas but exhibits a highly variable elytral pattern across its geographic distribution (Jiang et al., 2023a). Upon examination, the specimens of *P. dissimilis* from the Matsu Islands showed longitudinal series of yellow spots that were indistinct or disappearing along the entire length of the elytron, resembling *P. chujoi* in appearance. However, the shape of the median lobe of the aedeagus corresponded to that of the species *P. dissimilis*, distinguishing it from *P. chujoi*. Furthermore, it's worth noting that *P. dissimilis* demonstrates a confirmed high variability in elytral patterns. Consequently, we concluded that this species is either identical to or closely related to *P. dissimilis*. This determination is further supported by the geographical distribution: *P. dissimilis* is common on the mainland and near the Matsu Islands. The natural barrier, the strait between the mainland and the islands, is easier to overcome than the vast distance between Taiwan and the Japanese islands where *P. chujoi* occurs. Additionally, *P. dissimilis* exhibits high morphological variation in elytra patterns, and it is possible that it may later be subdivided into more species through DNA sequence analysis.

Family Gyrinidae Latreille, 1802  
豉甲科

*Dineutus cf. orientalis* (Modder, 1776)  
東方圓豉甲  
(Fig. 1D)

**Specimens examined.** No specimens were examined.

**Distribution.** Taiwan: Taiwan Island and the Matsu Islands (Takizawa, 1931; Wu, 2003). This species is also recorded in China, Korea, Japan, and Russia (Far East) (Lee & Ahn, 2015).

**Remark.** Wu (2003) reported Gyrinidae from Matsu; however, it was only identified as "Gyrinidae sp." without providing a species identification. Fortunately, the report includes photos (Fig. 1D), which allow us to speculate that this species may be *Dineutus orientalis* (Modder, 1776).



Figure 1. Hydradephaga of the Matsu Islands. A – *Allodessus megacephalus* (Gschwendtner, 1931), dorsal habitus; B–C – *Platynectes dissimilis* (Sharp, 1873): B – dorsal habitus, C – penis; D – *Dineutus* cf. *orientalis* (Modder, 1776), photo modified from Wu (2003), Photo by Dan Lu.

#### Family Hydrophilidae Latreille, 1802

##### 牙蟲科

#### *Dactylosternum* cf. *hydrophiloides* (MacLeay, 1825)

##### 大點紋牙蟲

(Fig. 2A)

**Specimens examined.** TAIWAN: 1 ♀. Lienchiang, Beigan, Banli beach (坂里沙灘), 26.2157, 119.9764, 26-27.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Distribution.** Taiwan: Taiwan Island, with a new record for the Matsu Islands. This species is also found in Southeast Asia, South Asia, Australia, South Africa, and Jamaica (Mai et al., 2022).

**Remark.** This species is the only terrestrial species among the Hydrophilidae reported from the Matsu Islands so far.

#### *Enochrus* sp.

##### 蒼白牙蟲屬未定種

(Fig. 2B, F)

**Specimens examined.** TAIWAN: 1 ex. Lienchiang, Nangan, Motianling Trail (摩天嶺步道), 26.1610, 119.9524, 25-26.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS); 2 ♂♂, 3 exs. Lienchiang, Nangan, Siwei (四維路), 26.1731, 119.9172, 25-26.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Remark.** This genus probably contains numerous unknown species in East and Southeast Asia, but it is poorly characterized, making species identification difficult. Furthermore, there is still a lack of comprehensive taxonomic reports, which prevents us from identifying it to the species level.

#### *Helochaeres neglectus* (Hope, 1845)

##### 密突麗陽牙蟲

(Fig. 2C)

**Specimens examined.** TAIWAN: 1 ♂, 4 exs. Lienchiang, Nangan, Shengtian Park (勝天公園), 26.1540, 119.9160, 25-26.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Distribution.** Taiwan: Taiwan Island and Penghu Islands (Jia, 2005; Liu et al., 2020), with a new record for the Matsu Islands. This species is also known in China, Nepal, and Thailand (Hansen, 1999; Yang et al., 2021).

*Helochares* sp.  
麗陽牙蟲屬未定種  
(Fig. 2D)

**Specimens examined.** TAIWAN: 1 ♀. Lienchiang, Nangan, Beigan, Banli beach (坂里沙灘), 26.2157, 119.9764, 26-27.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Remark.** This specimen is the only female specimen available. Based on its size and pronotum features, we do not believe it to be *Helochares neglectus*. However, species identification within this genus heavily relies on male genitalia, and as a result, we were unable to determine the species.

*Sternolophus rufipes* (Fabricius, 1792)  
姬牙蟲  
(Fig. 2E)

**Specimens examined.** TAIWAN: 2 exs. Lienchiang, Nangan, Motianling Trail (摩天嶺步道), 26.1610, 119.9524, 25-26.V.2023, light trap, Y.-H. Ho & H.-J. Chang leg. (NMNS).

**Distribution.** Taiwan: Taiwan Island, Lanyu Island, and Kinmen Islands (Liu et al., 2021a, b), with a new record for the Matsu Islands. This species is also known from the following regions: South China, Korea, Japan, Southeast Asia, and South Asia (Nasserzadeh & Komarek, 2017).

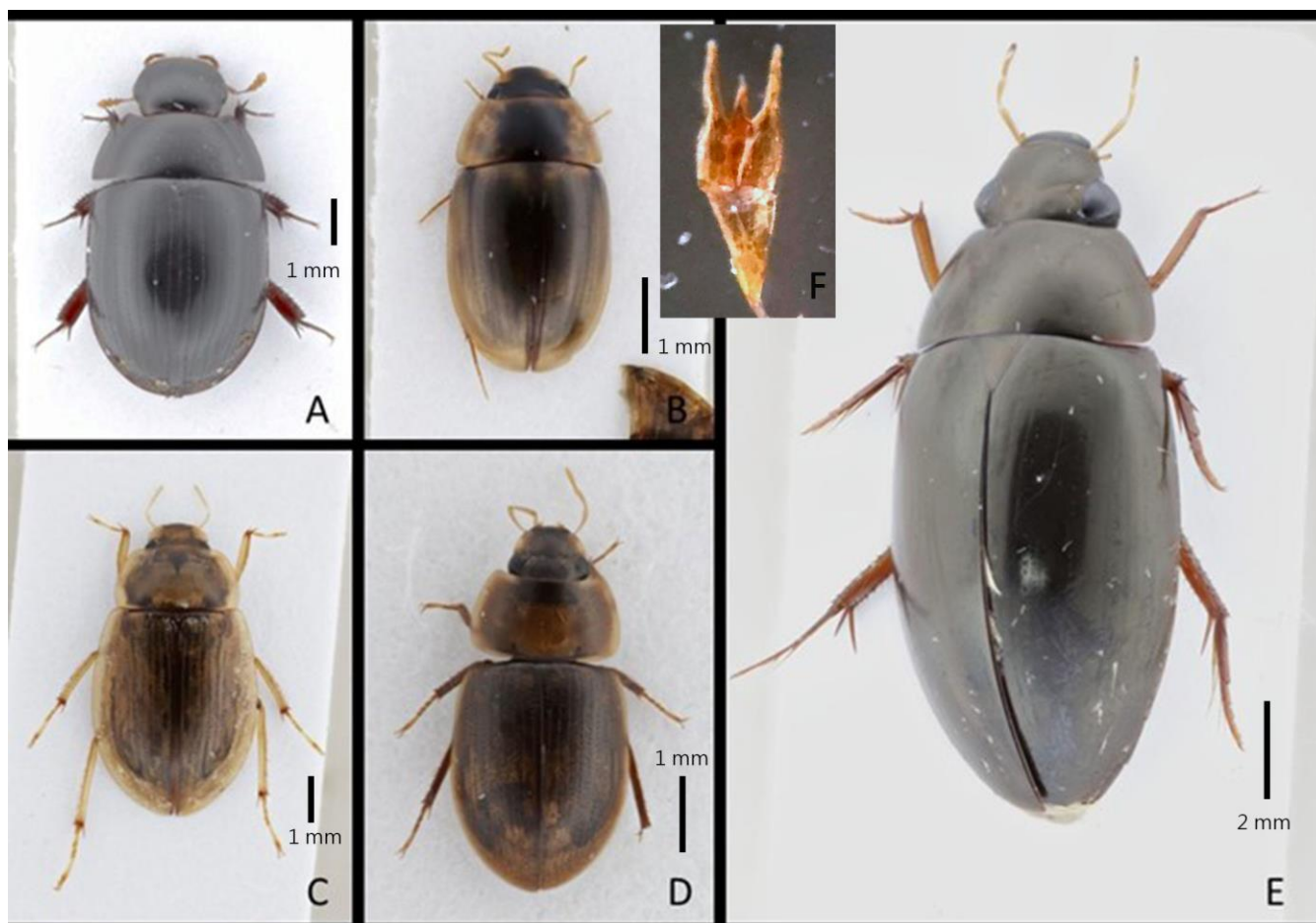


Figure 2. Dorsal habitus and aedeagus of Hydrophilidae from the Matsu Islands. A – *Dactylosternum hydrophiloides* (MacLeay, 1825); B – dorsal habitus of *Enochrus* sp.; C – *Helochares neglectus* (Hope, 1845); D – *Helochares* sp.; E – *Sternolophus rufipes* (Fabricius, 1792); F – aedeagus of *Enochrus* sp.



## Discussion

This report presents the results of a preliminary aquatic beetle survey in the Matsu Islands. The collection of aquatic beetle specimens was quite limited, with only *Platynectes dissimilis* (Sharp, 1873) obtained from water ditches, while the rest were collected using light traps. Unfortunately, we were unable to effectively collect more aquatic beetles, which may have hindered the rediscovery of the three species reported by Wu (2003). In this survey, two species (*Dactylosternum* cf. *hydrophiloides* (MacLeay, 1825) and *Helochares* sp.) could not be definitively identified due to insufficient specimens. Furthermore, it's worth noting that the first author examined the main museum with an insect collection in Taiwan and found that specimens from the Matsu Islands were extremely scarce, in stark contrast to those from Kinmen Islands and Lanyu Islands. This scarcity indicates a serious lack of insect survey and research in Matsu, highlighting the need for further investigation and study in this region.

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## 馬祖列島的水棲肉食亞目和牙蟲科註記 (昆蟲綱：鞘翅目)與暗紋扁形豆龍蟲首次記錄於臺灣

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**摘要：**本研究回顧臺灣馬祖群島的水棲肉食亞目和牙蟲科，共記錄 3 科 10 種 (8 種已知物種與 2 種未定種)。其中暗紋扁形豆龍蟲 (*Platynectes dissimilis* (Sharp, 1873)) 為臺灣新紀錄，以及 4 種為馬祖群島新紀錄：大頭豹斑龍蟲 (*Allodessus megacephalus* (Gschwendtner, 1931))、大點紋牙蟲 (*Dactylosternum* cf. *hydrophiloides* (MacLeay, 1825))、密突麗陽牙蟲 (*Helochares neglectus* (Hope, 1845)) 及姬牙蟲 (*Sternolophus rufipes* (Fabricius, 1792))。另外根據 Wu (2003) 提供的照片，我們推測馬祖的 Gyrinidae sp. 為 *Dineutus orientalis* Modder, 1776。

**關鍵詞：**動物相、分布、水棲昆蟲、離島、分類學