

# A Small Collection of Tingidae (Insecta: Heteroptera) from Taiwan, with a Checklist of the Known Species

**Masaaki Tomokuni**

Department of Zoology, National Science Museum, Tokyo, Shinjuku-ku, Tokyo, 169-0073 Japan  
E-mail: tomokuni@kahaku.go.jp

**Abstract.** Twenty-four species of Tingidae in 13 genera, including four unidentified species, are recorded from Taiwan on the basis of the specimens in the collection of the National Science Museum, Tokyo, Japan. Brief notes on their taxonomy and biology are given, if necessary. Of these, only a single species *Agramma japonicum* are new to Taiwan. *Helicia formosana* is a new host-plant record for *Ulonemia assamensis*. A checklist of the tingid species known from Taiwan is also provided for further studies toward the full inventory of this group.

**Key words:** Tingidae, new record, fauna, checklist, Taiwan.

## Introduction

It is well known that Taiwan has a rich insect fauna in its limited area. This came apparently from its geographic and topographic conditions. The island itself belongs biogeographically to the Oriental Region, but lies near the boundary to the Palearctic Region and is occupied extensively by high mountains over 3000 m a.s.l. As implied on its old name “Ilha Formosa”, meaning beautiful island, Taiwan is considered to have been covered originally by thick forests throughout. It is therefore quite likely that such a rich natural environment has developed and maintained high degree of species diversity in the insect community. Our knowledge of the insect fauna of Taiwan is, however, still insufficient except for a few well investigated groups like butterflies, stag beetles, dragonflies, and so on, and Tingidae is unquestionably one of the typical group of the former. After the taxonomic studies by Drake and Maa (1953, 1954, 1955) and Takeya (1962, 1963) only a few works have been published up to date.

I made collecting trips in Taiwan several times, in particular in 1990 and in 2002 and 2003 under research projects “Zoogeographic Study on the Derivation and Characteristics of the High Altitude Fauna of Taiwan” and “Natural History

Researches of the Island Arcs in the Western Pacific”, respectively, conducted by scientists from the National Science Museum, Tokyo (NSMT), Japan.

This paper reports some Tingidae from Taiwan based on a collection made by the field researchers mentioned above along with the specimens housed in the NSMT. As the first step toward the full inventory, I also provide a checklist of the tingid species known from Taiwan. All the materials examined in the present study are deposited in the insect collection of the NSMT.

## List of Species

In the following list generic and specific names are arranged alphabetically. Specimens examined are assembled under respective provinces where each locality of the specimens belongs to and arranged from north to south with their collecting data, viz. locality, number of specimens, date of collection, and collector. Some collectors are abbreviated as follows: KB, Kintaro Baba; MS, Masahiro Sakai; MT, Masaaki Tomokuni. As for the distribution and host plants for each species only the first records are cited.

Subfamily **Cantacaderinae** Stål, 1873***Cantacader lethierryi*** Scott, 1874

Specimen examined. Taitung Prov.: Chipen Spa, 1♂ (macropt.), 3–6.V.1972, MS.

Distribution. China (Drake, 1950), Korea (Lee & Kwon, 1991), Japan (Scott, 1874), Taiwan (Takeya, 1962), Vietnam?, Thailand? (Lee & Kwon, 1991).

Host plant. Unknown.

Notes. Another species of *Cantacader*, *C. formosus* Drake, 1950 described from Taiwan, was synonymized with this species by B. Lis (2003). She also questioned the previous record of this species from Vietnam and Thailand.

Subfamily **Tinginae** Laporte, 1833***Acalypra formosana*** Tomokuni, 1992

Specimens examined. 1♂ (holotype) and 2♀ (paratypes) from Wuling and Mt. Taosaifeng (for detail see Tomokuni, 1992).

Distribution. Taiwan (Tomokuni, 1992).

Host plant. Collected from an undetermined bryopsid moss growing on rocks (Tomokuni, 1992).

***Acalypra tomokunii*** Péricart, 2000

Specimen examined. Pingtung Prov.: Peitawshan ridge 2800–2910 m alt., 1♂ (paratype), 28.IV.1992, A. Smetana.

Distribution. Taiwan (Péricart, 2000).

Host plant. Unknown.

***Agramma formosanum*** (Matsumura, 1910)

Specimens examined. Hualien Prov.: Fuyuan, 2♀, 9–11.V.1972, MS. Taitung Prov.: Taping, 1♂, 7.V.1972, MS.

Distribution. China (Hainan Is.; Jing, 1981), Taiwan (Matsumura, 1910).

Host plant. *Saccharum officinarum* L. (sugar cane) (Takeya, 1962).

***Agramma japonicum*** (Drake, 1948b) (Fig. 1)

Specimens examined. Kaohsiung Prov.: Tsuyunshan Forestry Road 1300 m alt., 7♂6♀, 16.X.2002, MT.

Distribution. Russian Far East (Golub, 1988), China (Drake & Maa, 1953), Korea (Lee *et al.*, 1994), Japan (Drake, 1948b), Taiwan (new record).

Host plant. Unknown.

Notes. This species was once synonymized by Takeya (1962) with *A. nexile* (Drake, 1948b) described from Taiwan and Japan, but restored subsequently by Golub (1990). Being compared with Japanese material of *A. japonicum*, slight differences are recognized in the specimens from Taiwan, that is, the pronotum and elytra are a little more convex and the costal areas are a little wider in the latter; however, these differences are here considered to be intraspecific variations.

***Cysteochila chiniana*** Drake, 1942

Specimens examined. Taoyuan Prov.: Ssuleng 1,100 m alt., 1♂, 30.X.2003, MT. Nantou Prov.: Mt. Howang (Habon) 1800 m alt., 2♂2♀, 4.XI.2003, MT. Kaohsiung Prov.: Tengchih 1700 m alt., 1♀, 16.X.2002, MT.

Distribution. China (Drake, 1942), Japan (Takeya, 1951, as *Physatochila* [sic] *fieberi* (Scott, 1874)), Taiwan (cf. Drake & Ruhoff, 1965b), Vietnam (Péricart & Golub, 1996).

Host plant. *Cayratia japonica* (Thunb.) (Takeya, 1951, as *Cissus japonica*).

Notes. This species is rather common in Japan on its host-plant *Cayratia japonica*, which is also distributed in Taiwan, but its food habit in Taiwan is still unknown.

***Cysteochila fieberi*** (Scott, 1874)

Specimens examined. Taipei City: Sungshan, 1♂, 20.IV.1972, MS. Taipei Prov.: Wulai, 1♂, 7.V.1972, MS. Taoyuan Prov.: Chihtuan, nr Palin, 1♀, 27.IV.1978, N. Yashiro. Ilan Prov.: Mingchih 1150 m alt., 2♂2♀, 29.X.2003, MT; Fushan Botanical Garden 700 m alt., 1♂, 31.X.2003, 1♂, 1.XI.2003, MT. Hualien Prov.: Fuyuan, 5♂3♀, 9–11.V.1972, MS. Nantou Prov.: Mt. Lu-shan, 1♀, 8.VI.1976, J. Okuma; Lu-shan, 1♂2♀, 25.III.1977, Tak. Ishihara; Nanshanchi, 1♀, 26.III.1977, Y. Notsu; Mt. Howang (Habon) 1800 m alt., 1♂, 4.XI.2003, MT. Kaohsiung

Prov.: Paiyunshan, nr Chiah sien, 1 ♂, 21.III.1977, Y. Notsu & Tak, Ishihara; Liukuei, 2 ♀, 30.III.1986, KB; Shaping, nr Liukuei, 1 ♀, 10.IV.1986, KB; Shinanshan, nr Liukuei, 1 ♂, 4.V.1986, KB; Tsyunshan Forestry Road 1300 m alt., 34 ♂ 19 ♀, 16.X.2002, MT.

Distribution. China (Drake & Maa, 1954), Korea (Lee & Kwon, 1991), Japan (Scott, 1874), Taiwan (Drake & Maa, 1954), Bhutan, Nepal (Péricart, 1985), India (Drake & Maa, 1954).

Host plant. *Boehmeria spicata* Thunb. (Takeya, 1953b).

Notes. Péricart (1982, 1985) considered this species to belong to the genus *Physatocheila*. I collected a number of specimens of this species from *Boehmeria* plants at Tsyunshan Forestry Road and Mingchih in 2002 and 2003, respectively.

#### *Cysteochila* sp. 1 (Fig. 2)

Specimens examined. Pingtung Prov.: Kenting Park, 4 ♂ 5 ♀, 4.VI.1977, K. Ushijima.

Host plant. Unknown.

Notes. This is rather small (about 3.7 mm long) but distinct species with strongly raised pronotum, transversally ridged paranota, very high pronotal carinae, and characteristic dark markings on the hemelytra. These character states do not agree with those of any known species from East and Southeast Asia. Further examination with sufficient number of specimens for comparison including type material may clarify the identity of this species.

#### *Cysteochila* sp. 2 (Fig. 3)

Specimens examined. Hualien Prov.: Fuyuan, 1 ♀, 9–11.V.1972, MS. Kaohsiung Prov.: Tun Chih, nr Liukuei, 1 ♀, 2.VI.1986, KB; Thu Yun Shan, nr Liukuei, 1 ♀, 20.VI.1986, KB; Shi Nan Shan, nr Liukuei, 1 ♀, 15.VII.1986, KB.

Host plant. Unknown.

Notes. These specimens are very similar to those of *C. chiniana* in the size, shape, and coloration as a whole, but differ slightly from them in having a little more inflated hood, narrower and mostly uniseriate costal areas, and more

sharply elevated boundary between subcostal and discoidal areas. It is very difficult to decide their identity until more specimens from various localities in Taiwan become available.

#### *Dictyla evidens* (Drake, 1927)

Specimens examined. Pingtung Prov.: Kenting Park, 1 ♂, 14.III.1968, Y. Arita, 9 ♂ 3 ♀, 15.VI.1970, Y. Hori, 1 ♂, 28–30.IV.1972, MS, 1 ♂, 1–3.V.1972, MS.

Distribution. China (Drake & Maa, 1953, as *Monanthia formosana* [sic]); Japan (Takeya, 1953a, as *Monanthia formosa*); Taiwan (Drake, 1923, as *Monanthia formosa*); Philippines (Drake, 1927).

Host plants. *Ehretia thyrsoiflora* Nakai (Takeya, 1953a); *E. dicksonii* Hance and *E. taiwaniana* Nakai (Maa, 1957); *E. acuminata* R.Br. (Drake & Poor, 1937).

#### *Dictyla rasilis* (Drake & Maa, 1955)

Specimens examined. Kaohsiung Prov.: Mt. Paiyun-shan, Chiah sien, 1 ♀, 21.III.1977, Y. Notsu. Pingtung Prov.: Kenting Park, 3 ♀, 24.VI.1970, Y. Hori, 2 ♀, 17.III.1977, Y. Notsu & Tak. Ishihara.

Distribution. China (Jing, 1981), Taiwan (Drake & Maa, 1955).

Host plant. *Solanum verbascifolium* L. (Drake & Maa, 1955).

#### *Dictyla sauteri* (Drake, 1923)

Specimen examined. Kaohsiung Prov.: Shin Bao Shi, nr Liukuei, 1 ♀, 3.V.1986, KB.

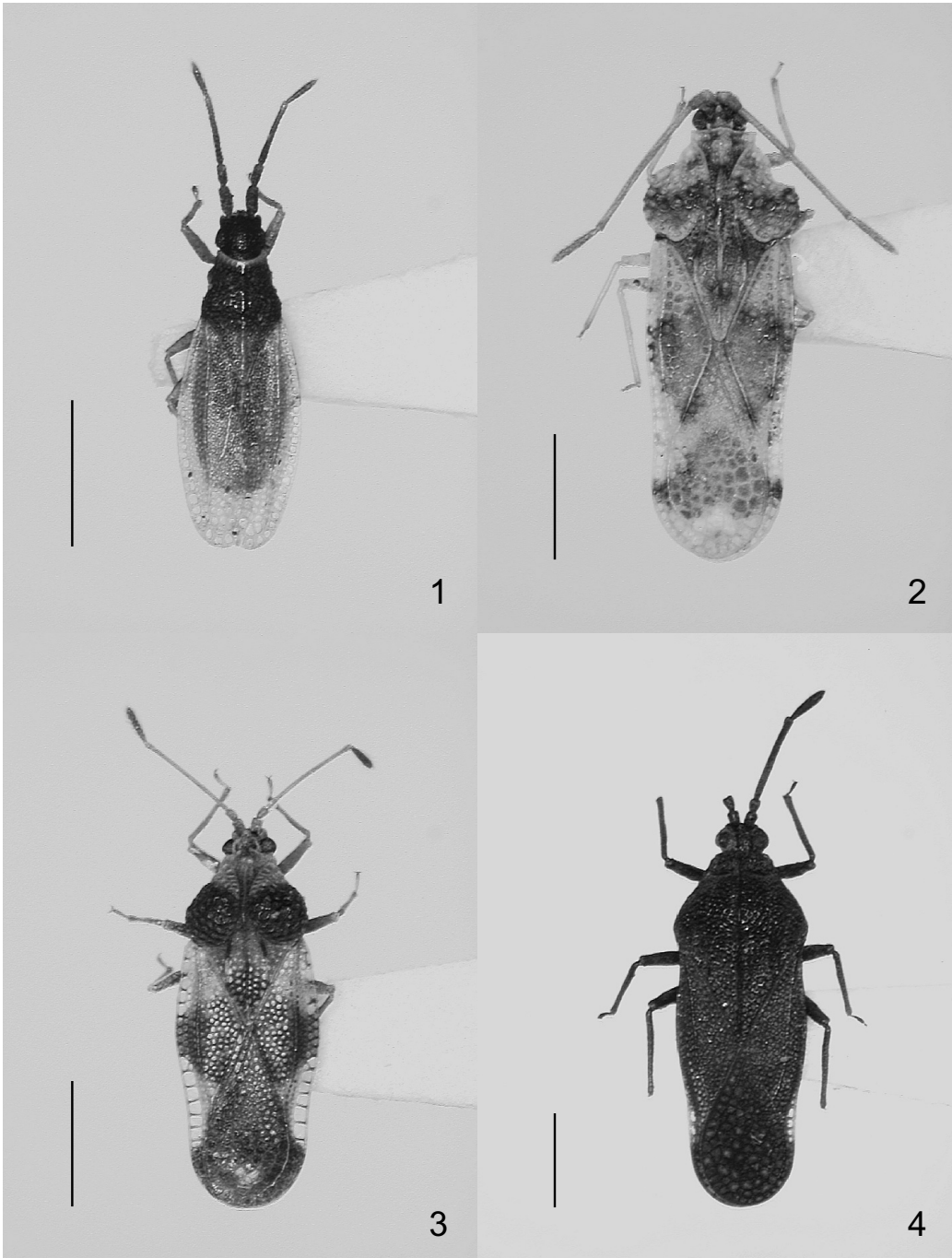
Distribution. Taiwan (Drake, 1923), Philippines (Drake, 1927), New Guinea (Drake & Ruhoff, 1965a).

Host plant. *Cordia myxa* L. (Drake & Poor, 1937).

#### *Dictyla seorsa* (Drake & Poor, 1937)

Specimens examined. Kaohsiung Prov.: Tsai Tieh Ku, nr Liukuei, 2 ♂, 2.V.1986, KB. Taitung Prov.: Chipen Spa, 1 ♀, 3–6.V.1972, MS.

Distribution. China (Drake, 1938), Taiwan, Philippines (Drake & Poor, 1937), India (Maa,



Figs 1–4. Tingidae spp. from Taiwan. 1, *Agramma japonicum* (Drake, 1948), female, Tsyunshan Forestry Road; 2, *Cysteochila* sp. 1, male, Kenting Park; 3, *Cysteochila* sp. 2, female, Tun Chih; 4, *Leptoypha* sp., male, Sha Ping. Scale bars 1 mm.

1957).

Host plant. Unknown.

***Leptoypha* sp.** (Fig. 4)

Specimens examined. Kaohsiung Prov.: Mt. Nanfengshan 1000 m alt., nr Liukuei, 1 ♀, 21.III.1981, T. Shimomura; Sha Ping, nr Liukuei, 4 ♂, 25.VII.1986, KB; Ya Kou ca 2800 m alt., nr Liukuei, 1 ♂, 1.VIII.1986, KB; Fa Kuo Shan 800 m alt., nr Liukuei, 1 ♀, 8.IX.1986, KB.

Host plant. Unknown.

Notes. This is very distinct species with blackish body covered by numerous silvery, depressed, curly pubescence and with remarkably convex pronotum. It is easily separable from other species of *Leptoypha* known from the Old World, but the final identification is here postponed until comparative specimens of the New World species become available.

***Perissonemia hasegawai*** Takeya, 1962 (Fig. 5)

Specimens examined. Nantou Prov.: Yu Shih 1900 m alt., 1 ♂ 1 ♀, 4.VII.1986, KB. Kaohsiung Prov.: Liukuei, 1 ♀, 31.III.1986, KB; Sha Ping 1000 m alt., nr Liukuei, 2 ♀, 29.IV.1986, KB; Sha Ping, nr Liukuei, 3 ♀, 9.XI.1986, KB; Tsuyunshan Forestry Road 1300 m alt., 1 ♂ 2 ♀, 16.X.2002, MT. Pingtung Prov.: Kenting Park, 1 ♂ 1 ♀, 1–3.V.1972, MS, 1 ♂, 16–18.III.1977, MS.

Distribution. Taiwan (Takeya, 1962).

Host plant. Unknown.

Notes. This lacebug is not rare in mountainous area in the southern part of Taiwan, but its biology is still unknown.

***Physatocheila* sp.** (Fig. 6)

Specimens examined. Taichung Prov.: Chika Shanchuang 2400 m alt., Mt. Hsuehshan, Huping, 1 ♂ 3 ♀, 13.VIII.1990, MT; Yusheng Chi–Mt. Tochiatun–Yunleng Shanchuang, 2300–2800 m alt., Huping, 1 ♂ 1 ♀, 2.VIII.1990, MT; Nantou Prov.: Sungkan–Meifeng 2044–2127 m alt., 1 ♀, 19.V.1969, S. Hisamatsu; Sungkan–Meifeng, 1 ♀, 25–26.V.1972, MS; Tsuifeng–Sungkan, 1 ♀, 23.III.1977, Y. Notsu.

Host plant. Unknown.

Notes. This lacebug closely resembles *Physatocheila miyatakei* Miyamoto, 1964 in general appearance, but has a little larger (3.7 mm long) body, and wider paranota and costal and discoidal areas, which are 5-, 4-, and 10-seriate at each widest part, respectively. All the specimens examined were collected in the alpine zone of central Taiwan at altitudes of 2000–2800 m. On the contrary, only a single known specimen (holotype) of *P. miyatakei* was found at lower altitude in Ishigaki Island, the Ryukyus, Japan. When adequate number of *P. miyatakei* specimens becomes available for comparison, the identity of the Taiwanese species will be clarified.

***Stephanitis (Stephanitis) gallarum*** Horváth, 1906

Specimen examined. Taichung Prov.: Kahodai (Chiapaotai)–Reimei (Liming), Hassenzan (Pahsienshan), 1 ♂, 12.VII.1932, T. Esaki (a paratype of *Stephanitis distinctissima* Esaki & Takeya, 1933).

Distribution. China (Drake, 1938), Taiwan (Esaki & Takeya, 1933), Bhutan (Péricart & Golub, 1996), India (Horváth, 1906).

Host plants. *Machilus gamblei* King (Horváth, 1906), *M. longifolia* Bl. (Takeya, 1951), *M. pseudolongifolia* Hayata (Esaki & Takeya, 1933).

***Stephanitis (Stephanitis) pyrioides*** (Scott, 1874)

Specimens examined. Taipei City: National Taiwan University, 8 ♂ 18 ♀, 20.IV.2005, MT; Yang-ming-shan, 3 ♂ 3 ♀, 24.VI.1965, T. Yamasaki; Sungshan, 1 ♂, 20.IV.1972, MS. Taipei Prov.: Wulai, 4 ♂ 6 ♀, 21.IV.1972, MS. Ilan Prov.: Fushan Botanical Garden 700 m alt., 13 ♂ 10 ♀, 24.X.2002, 2 ♂ 3 ♀, 31.X.2003, 1 ♀, 1.XI.2003, MT. Nantou Prov.: Mt. Howang (Habon) 1800–2000 m alt., 2 ♂, 20.X.2002, MT. Chiayi Prov.: Fenchihu, 2 ♂, 25–26.IV.1972, MS. Tainan Prov.: Kanshirei (Kuantyiling), 1 ♂ 1 ♀, 1.II.1983, KB. Kaohsiung Prov.: Shihshan Forestry Road 2200 m alt., 5 ♂ 7 ♀, 18.X.2002, MT. Pingtung Prov.: Kenting Park, 1 ♂, 28–30.IV.1972, MS.

Distribution. Widely distributed in the eastern Palearctic and northern Oriental Regions. Occasionally imported into Europe, the New World, and Australia (cf. Drake & Ruhoff, 1965b).

Host plants. Many species of *Rhododendron* trees. Known as a serious pest insect of cultivated azalea.

Notes. I collected many specimens of this lacebug also from cultivated azaleas at the National Taiwan University, the Fushan Botanical Garden, and the Shihshan Forestry Road.

***Stephanitis (Stephanitis) veridica* Drake, 1948a**

Specimens examined. Taichung Prov.: Szuyuan–Yusheng Chi 1920–2300 m alt., 45 ♂35 ♀, 1.VIII.1990, MT. Nantou Prov.: Tattaka (Sung kang), 6 ♂13 ♀, 29.VI.1965, T. Yamasaki.

Distribution. Taiwan (Drake, 1948a).

Host plant. *Trochodendron aralioides* Sieb. et Zucc. (Takeya, 1963).

Notes. I collected above-mentioned specimens also from *Trochodendron aralioides* in Taichung Province.

***Stephanitis (Norba) esakii* Takeya, 1931**

Specimens examined. Taipei City: Yomeizan (Yangmingshan), 3 ♂5 ♀, 27.I.1983, KB. Ilan Prov.: Fushan Botanical Garden 700m alt., 1 ♂3 ♀, 25.X.2002, MT. Chiayi Prov.: Fenchihu, 1 ♂2 ♀, 25–26.IV.1972, MS. Nantou Prov.: Tattaka (Sung kang), 2 ♂7 ♀, 29.VI.1965, T. Yamasaki; Mt. Howang (Habon) 1800 m alt., 3 ♂5 ♀, 20.X.2002, 4 ♂1 ♀, 4.XI.2003, MT. Kaohsiung Prov.: Tsyunshan Forestry Road 1300 m alt., 2 ♂4 ♀, 16.X.2002, MT; Shihshan Forestry Road 1700 m alt., 5 ♂3 ♀, 17.X.2002, U. Kurosu; Shihshan Forestry Road 2200 m alt., 18 ♂7 ♀, 18.X.2002, MT; Tengchih 2000 m alt., 1 ♀, 17.X.2002, MT; Sha Ping 1000 m alt., nr Liukuei, 5 ♂5 ♀, 29.IV.1986, KB; Meishan–Tinchi 800–2300 m alt., 4 ♂4 ♀, 29.VI.1986, KB.

Distribution. Taiwan (Takeya, 1931).

Host plants. *Machilus thunbergii* Sieb. et Zucc. (Takeya, 1931), *Machilus* sp., *Tetradenia dolichocarpa* Hayata (Maa, 1957).

Notes. This is the commonest among the *Stephanitis* species in Taiwan. I collected some specimens of this species on *Machilus thunbergii* at the Fushan Botanical Garden and on a lauraceous tree at the Shihshan Forestry Road.

***Tanytingis takahashii* Drake, 1939 (Fig. 7)**

Specimens examined. Miaoli Prov.: Shih-tou-shan, 3 ♀, 4.VI.1976, J. Okuma.

Distribution. Taiwan (Drake, 1939).

Host plant. Unknown.

Notes. This morphologically remarkable species seems to be rare in Taiwan and only a few specimens has been collected so far.

***Uhlerites debilis* (Uhler, 1896)**

Specimens examined. Taichung Prov.: Wuling 1900 m alt., 20 ♂21 ♀14 nymphs, 11.VIII.1990, MT; Wuling–Chika Shanchuang 1900–2400 m alt., 9 ♂24 ♀4 nymphs, 13.VIII.1990, MT.

Distribution. Russian Far East (Lindberg, 1927), China (Drake, 1948a), Korea (Takeya, 1932), Japan (Uhler, 1896), Taiwan (Takeya, 1951).

Host plants. *Castanea crenata* Sieb. et Zucc. (as *C. sativa*), *Quercus. acutissima* Carr. (as *Q. serrata*), *Q. serrata* Thunb. (as *Q. glandulifera*) (Takeya, 1931), *Q. dentata* Thunb. (Saitô, 1933), *Q. phillyraeoides* A. Gray (Takeya, 1962).

Notes. The Taiwanese specimens examined were collected from *Quercus* trees, probably *Q. variabilis* Blume.

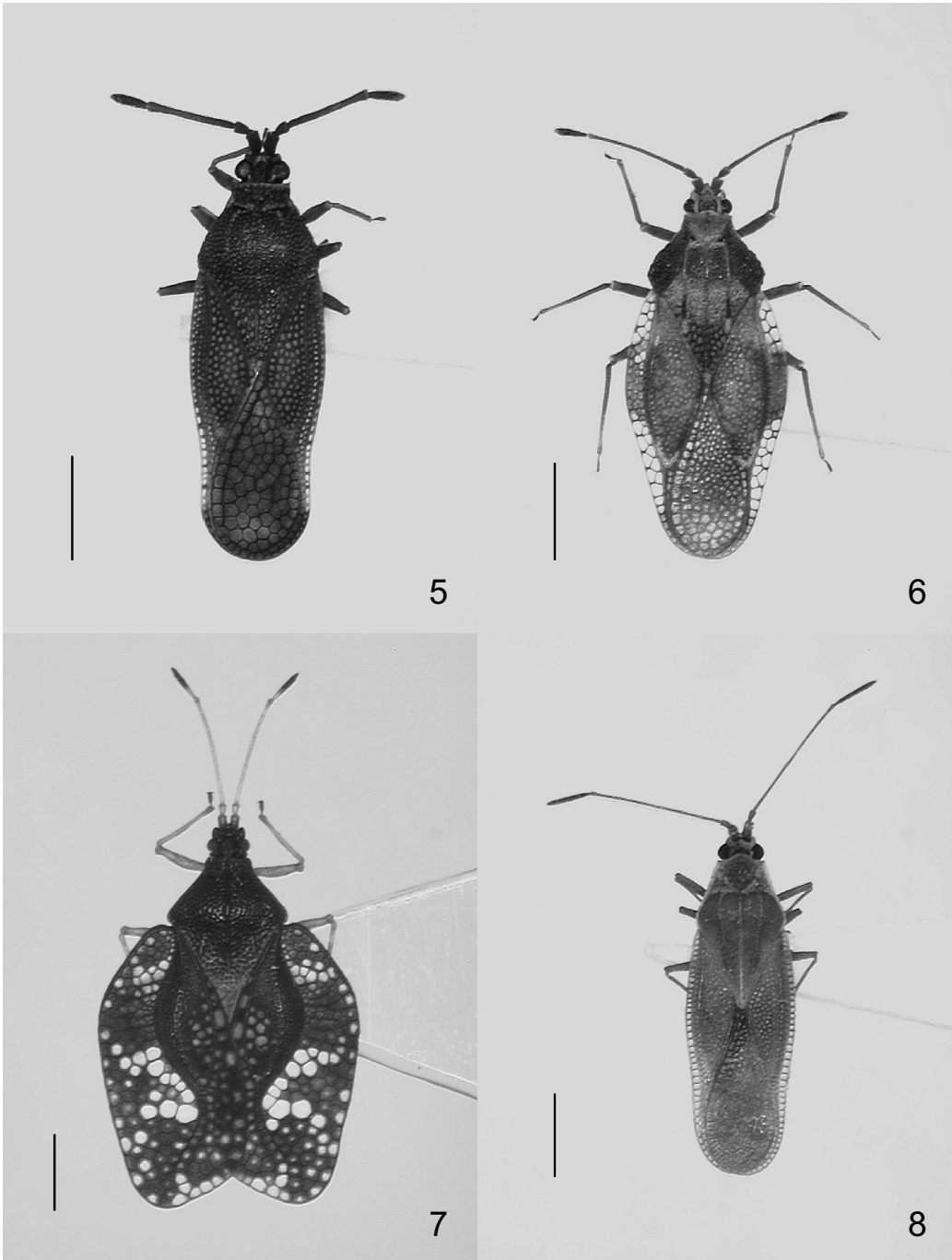
***Ulonemia assamensis* (Distant, 1903) (Fig. 8)**

Specimens examined. Ilan Prov.: Fushan Botanical Garden 700 m alt., 11 ♂13 ♀, 25.X.2002, 18 ♂13 ♀, 1.XI.2003, 1 ♀, 2.XI.2003, MT.

Distribution. China (Drake, 1937), Hainan Is., Taiwan (Drake & Poor, 1936), Vietnam (cf. Péricart & Golub, 1996), Borneo (cf. Drake & Ruhoff, 1965b), India (Distant, 1903).

Host plant. *Helicia formosana* Hemsl. (Proteaceae) (new host record).

Notes. All the specimens examined were collected from the *Helicia* tree at the Fushan Botanical Garden.



Figs 5–8. Tingidae spp. from Taiwan. 5, *Perissonemia hasegawai* Takeya, 1962, female, Tsyunshan Forestry Road; 6, *Physatocheila* sp., female, Yusheng Chi–Mt. Tochiatun–Yunleng Shanchuang; 7, *Tanytingis takahashii* Drake, 1939, female, Shih-tou-shan; 8, *Ulonemia assamensis* (Distant, 1903), female, Fushan Botanical Garden. Scale bars 1 mm.

*Xenotingis horni* Drake, 1923

Specimen examined. Nantou Prov.: Nanshangchi, 1 ♀, 24–26.III.1977, Y. Notsu.

Distribution. Taiwan (Drake, 1923).

Host plant. Unknown.

### Discussion

A total of 24 species of Tingidae in 13 genera are here confirmed from Taiwan including four unidentified ones, and only a single species, *Agramma japonicum*, is newly recorded from the island. Of the 20 identified species, seven are currently known only from Taiwan, namely *Acalypta formosana*, *A. tomokunii*, *Perissonemia hasegawai*, *Stephanitis veridica*, *S. esakii*, *Tanytingis takahashii*, and *Xenotingis horni*. Out of remaining 13 species, four species viz. *Cantacader lethierryi*, *Agramma japonicum*, *Stephanitis pyrioides*, and *Uhlerites debilis* are considered from their distributional patterns to be the Palearctic elements, seven species viz. *Cysteochila chiniana*, *C. fieberi*, *Dictyla evidens*, *D. sauteri*, *D. seorsa*, *Stephanitis gallarum*, and *Ulonemia assamensis* to be the Oriental elements, and two species, *Agramma formosana* and *Dictyla rasilis*, are of uncertain origin which are distributed only in Taiwan and southern part of mainland China. Although the number of species is too small, the ratio of respective elements seem to reflect well the geological history and zoogeographic location of Taiwan, i.e., it has never been connected with the Continent of Asia and located in the Oriental Region near the boundary to the Palearctic Region. Accordingly the ratios of the endemic and Oriental species are comparatively high and the Palearctic species also inhabit though not many.

To understand the biology of Tingidae knowledge of their host-plants are indispensable. But, it is unfortunately still insufficient for the Taiwanese Tingidae. Only a single new host record, *Helicia formosana*, can be added in the present study for *Ulonemia assamensis*.

As shown in the checklist appendant to the present paper, only 48 species of Tingidae have

so far been recorded from Taiwan. The species number is too small in comparison with that from Japan where about 70 species are known to occur. Species diversity of insects at family level is generally much richer in Taiwan than in Japan. The small number may therefore be considered due to insufficiency of field surveys in Taiwan.

### Acknowledgments

I thank Yau-i Chu, Ping-shih Yang, Chiuncheng Ko, and Chun-lin Li of the National Taiwan University for their attentive arrangement of my researches in Taiwan. I am also grateful to Wern-jyh Lin of Taipei City, Hsiau-yue Wang of the National Taiwan Museum, Mamoru Owada of the National Science Museum, Tokyo, Utako Kurosu of the Tokyo University of Agriculture, and staff of the Fushan Botanical Garden for their kind supports to my fieldwork.

### Appendix: Checklist of Tingidae from Taiwan

Subfamily Cantacaderinae Stål, 1873

Tribe Cantacaderini Stål, 1873

Genus *Cantacader* Amyot & Serville, 1843  
*formosus* Drake, 1950  
*lethierryi* Scott, 1874

Tribe Phatnomini Drake & Davis, 1960

Genus *Phatnoma* Fieber, 1844  
*takasago* Takeya, 1933

Subfamily Tinginae Laporte, 1832

Tribe Tinginae, Laporte, 1832

Genus *Abdastartus* Distant, 1910  
*sacchari* Drake, 1930  
 Genus *Acalypra* Westwood, 1840  
*formosana* Tomokuni, 1992  
*tomokunii* Péricart, 2000  
 Genus *Agramma* Stephens, 1829  
*formosanum* (Matsumura, 1910)  
*japonicum* (Drake, 1948)  
*nexile* (Drake, 1948)



Genus *Baeochila* Drake & Poor, 1937  
*elongata* (Distant, 1903)  
*scitula* Drake, 1948

Genus *Belenus* Distant, 1909  
*dentatus* (Fieber, 1844)

Genus *Copium* Thunberg, 1822  
*japonicum* Esaki, 1931

Genus *Cysteochila* Stål, 1873  
*chiniana* Drake, 1942  
*consueta* Drake, 1948  
*fieberi* (Scott, 1874)

Genus *Dictyla* Stål, 1874  
*evidens* (Drake, 1927)  
*rasilis* (Drake & Maa, 1955)  
*sauteri* (Drake, 1923)  
*seorsa* (Drake & Poor, 1937)  
*uichancoi* (Drake & Poor, 1937)

Genus *Eteoneus* Distant, 1903  
*dilatatus* (Distant, 1903)

Genus *Lasiacantha* Stål, 1873  
*altimitrata* (Takeya, 1933)

Genus *Lepturga* Stål, 1873  
*chinai* Takeya, 1962

Genus *Metasalis* Lee, 1971  
*populi* (Takeya, 1932)

Genus *Paracopium* Distant, 1902  
*sauteri* Drake, 1951

Genus *Penottus* Distant, 1903  
*verdicus* Drake & Maa, 1953

Genus *Perissonemia* Drake & Poor, 1937  
*hasegawai* Takeya, 1962

Genus *Stephanitis* Stål, 1873  
 Subgenus *Menodora* Horváth, 1912  
*formosa* Horváth, 1912  
*sondaica* Horváth, 1912  
 Subgenus *Norba* Horváth, 1912  
*aperta* Horváth, 1912  
*esakii* Takeya, 1931  
*exigua* Horváth, 1912  
 Subgenus *Stephanitis* Stål, 1873  
*ambigua* Horváth, 1912  
*gallarum* Horváth, 1906  
*hydrangeae* Drake & Maa, 1955  
*laudata* Drake & Poor, 1953  
*nashi nashi* Esaki & Takeya, 1931  
*pyrioides* (Scott, 1874)

*subfasciata* Horváth, 1912  
*typica* (Distant, 1903)  
*veridica* Drake, 1948

Genus *Tanytingis* Drake, 1939  
*takahashii* Drake, 1939

Genus *Tingis* Fabricius, 1803  
 Subgenus *Tingis* Fabricius, 1803  
*ampliata* (Herrich-Schaeffer, 1838)  
*veteris* Drake, 1942

Genus *Uhlerites* Drake, 1927  
*debilis* (Uhler, 1896)

Genus *Ulonemia* Drake & Poor, 1937  
*assamensis* (Distant, 1903)

Genus *Xenotingis* Drake, 1923  
*horni* Drake, 1923

## References

- Distant, W. L., 1903. The Fauna of British India, including Ceylon and Burma. xvii+503 pp. (pp. 243–503 published in 1904). Taylor and Francis, London.
- Drake, C. J., 1923. Some Tingitidae from Japan (Hemip.). *Ohio Journal of Science*, **23**: 102–106.
- Drake, C. J., 1927. Tingitidae from the Far East (Hemiptera). *Philippine Journal of Science*, **32**: 53–59.
- Drake, C. J., 1937. Tingitidae from South China (Hemiptera). *Lingnan Science Journal*, **16**: 591–594.
- Drake, C. J., 1938. Chinese Tingitidae (Hemiptera). *Lingnan Science Journal*, **17**: 195–197.
- Drake, C. J., 1939. A new genus and species of tingitid (Hemiptera) from Formosa. *Transactions of the Natural History Society of Formosa*, **29**: 205–206.
- Drake, C. J., 1942. New Tingitidae (Hemiptera). *Iowa State College Journal of Science*, **17**: 1–21.
- Drake, C. J., 1948a. New species of *Stephanitis* Stål including a list of species of the World (Hemiptera). *Notes d'Entomologie Chinoise*, **12**: 45–56.
- Drake, C. J., 1948b. New Tingidae from the Orient and other regions (Hemiptera: Heteroptera). *Notes d'Entomologie Chinoise*, **12**: 173–178.
- Drake, C. J., 1950. Concerning the Cantacaderinae of the World (Hemiptera: Tingidae). *Arthropoda*, **1**: 153–166.
- Drake, C. J. & T. Maa, 1953. Chinese and other Oriental Tingoidea (Hemiptera). *Quarterly Journal of the Taiwan Museum*, **6**: 87–101.
- Drake, C. J. & T. Maa, 1954. Chinese and other Oriental Tingoidea (Hemiptera). II. *Quarterly Journal of the Taiwan Museum*, **7**: 111–118.
- Drake, C. J. & T. Maa, 1955. Chinese and other Oriental Tingoidea (Hemiptera). III. *Quarterly Journal of the Taiwan Museum*, **8**: 1–11.

- Drake, C. J. & M. E. Poor, 1936. Tingitidae from Hainan Island (Hemiptera). *Lingnan Science Journal*, **15**: 439–443.
- Drake, C. J. & M. E. Poor, 1937. Some Tingitidae (Hemiptera) from Oceania. *Iowa State College Journal of Science*, **11**: 397–404.
- Drake, C. J. & F. A. Ruhoff, 1965a. Lacebugs from New Guinea, Borneo, Solomons, and other islands of the South Pacific and Indian Oceans (Hemiptera: Tingidae). *Pacific Insects*, **7**: 243–290.
- Drake, C. J. & F. A. Ruhoff, 1965b. Lacebugs of the World, a catalog (Hemiptera: Tingidae). *United States National Museum Bulletin*, (243): I–VIII, 1–634, pls 1–56.
- Esaki, T. & C. Takeya, 1933. A new tingitid from Formosa (Hemiptera: Tingitidae). *Mushi*, **6**: 1–3.
- Golub, V. B., 1988. Fam. Tingidae. In: Ler, P. A. (ed.) [*Keys to the Insects of the Far East of the USSR*]. Vol. II. Pp. 857–869. Nauka, Leningrad. (In Russian)
- Golub, V. B., 1990. [Materials to the taxonomy of the lace-bug of the genus *Agramma* Steph. (Heteroptera, Tingidae) of the fauna of the USSR and Mongolia]. *Nasekomye Mongolii*, **11**: 40–69. (In Russian)
- Horváth, G., 1906. A new gall-inhabiting bug from Bengal. *Entomologist's Monthly Magazine*, **42**: 33–34.
- Jing, H.-L., 1981. Tingidae. In: Hsiao, T.-Y., S.-H. Ren, L.-Y. Zheng, H.-L. Jing, H.-G. Zou & S.-L. Liu (eds) *A Handbook for the Determination of the Chinese Hemiptera-Heteroptera*. Vol. II. Pp. 271–368+614–615, pls 42–50. Science Press, Beijing. (In Chinese with English description for a new species)
- Lee, C. E. & Y. J. Kwon, 1991. Annotated check list of Hemiptera from Korea. Part 2. Cimicomorpha (excluding Miridae). *Nature and Life*, **21**: 11–21.
- Lee, C. E., S. Miyamoto & I. M. Kerzhner, 1994. Additions and corrections to the list of Korean Heteroptera. *Nature and Life*, **24**: 1–34.
- Lindberg, H., 1927. Zur Kenntnis der Heteropterenfauna von Kamtschatka sowie der Amur — und Ussuri — Gebiete. Ergebnisse einer von Y. Wuorentaus in Jahre 1917 unternommenen Forschungsreise. *Acta Societatis pro Fauna et Flora Fennica*, **56** (9): 1–26.
- Maa, T., 1957. Nymphal stages of certain Oriental Tingidae (Hemiptera). *Quarterly Journal of the Taiwan Museum*, **10**: 117–133.
- Matsumura, S., 1910. Die Schädlichen und Nützlichen Insekten vom Zuckerrohr Formosas. 52 pp. Keiseisha, Tokyo.
- Lis, B., 2003. Revision of the genus *Cantacader* Amyot et Serville, 1843 (Hemiptera: Heteroptera: Cantacaderidae). *Polskie Pismo Entomologiczne*, **72** (Supplement): 1–222.
- Péricart, J., 1982. Révision systématique des Tingidae Ouest-paléarctiques (Hemiptera) 9. Compléments et corrections. *Annales de la Société Entomologique de France (N. S.)*, **18**: 349–372.
- Péricart, J., 1985. Tingidae nouveaux ou intéressants du Nord du sous-continent Indien (Hemiptera). II. *Entomologica Basiliensia*, **10**: 27–62.
- Péricart, J., 2000. Quelques Tingidae nouveaux ou intéressants est-paléarctiques et orientaux (Heteroptera). *Bulletin de la Société Entomologique de France*, **105**: 187–194.
- Péricart, J. & V. B. Golub, 1996. Superfamily Tingoidea Laporte, 1832. In: Aukema, B. & C. Rieger (eds) *Catalogue of the Heteroptera of the Palaearctic Region*. Pp. 3–83. Netherlands Entomological Society, Amsterdam.
- Saitô, K., 1933. [On a new variety and an unrecorded species of Tingidae from Korea, with the food-plants of Korean Tingidae]. *Journal of the Chôsen Natural History Society*, (15): 5–7. (In Japanese)
- Scott, J., 1874. On a collection of Hemiptera Heteroptera from Japan. Description of various new genera and species. *Annals and Magazine of Natural History*, (4) **14**: 289–304, 360–365, 426–452.
- Takeya, C., 1931. Some Tingitidae of the Japanese Empire. *Mushi*, **4**: 65–84.
- Takeya, C., 1932. Some Korean lace-bugs (Hemiptera, Tingidae) (Tab. 1). *Mushi*, **5**: 8–13.
- Takeya, C., 1951. A tentative list of Tingidae of Japan and her adjacent territories (Hemiptera). *Kurume University Journal (Natural Science)*, **4** (1): 5–28.
- Takeya, C., 1953a. An unrecorded tingid from Japan (Hemiptera). *Kurume University Journal (Natural Sciences)*, **5**: 4–7. (In Japanese)
- Takeya, C., 1953b. Notes on the Tingidae of Shikoku, Japan (Hemiptera). *Transaction of the Shikoku Entomological Society*, **3**: 167–176.
- Takeya, C., 1962. Taxonomic revision of the Tingidae of Japan, Korea, the Ryukyus and Formosa Part 1 (Hemiptera). *Mushi*, **36**: 41–75.
- Takeya, C., 1963. Taxonomic revision of the Tingidae of Japan, Korea, the Ryukyus and Formosa Part 2 (Hemiptera). *Mushi*, **37**: 27–52.
- Tomokuni, M., 1992. A new *Acalypta* (Heteroptera, Tingidae) from Taiwan. *Bulletin of the National Science Museum, Series A (Zoology)*, **18**: 41–43.
- Uhler, P. R., 1896. Summary of the Hemiptera of Japan, presented to the United States National Museum by Professor Mitzukuri. *Proceedings of the United States National Museum*, **19**: 255–297.

## 台湾で採集されたグンバイムシと全既知種のチェックリスト

友国 雅章

国立科学博物館によるプロジェクト「西太平洋における島弧の自然史科学的総合研究」その他の調査で得られた台湾産のグンバイムシから、4未同定種を含めて13属24種を記録した。うち、*Agramma japonicum* は台湾からの初記録となる。また、*Ulonemia assamensis* の寄主植物 *Helicia formosana* (台湾名：山龍眼) も新しい知見である。

同定できた20種のうち、7種が台湾固有種、7種が東洋区系の種、4種が旧北区系の種であり、残りの2種は分布域が狭くその起源を推定できなかった。このような種構成は、台湾の地史と生物地理学的位置、すなわち、これまでアジア大陸あるいは他の大きい島と陸続きになったことがなく、東洋区に属しながら旧北区との境界に近く位置していることをよく反映していると考えられる。

台湾のグンバイムシ相はこれまで十分に調査されておらず、チェックリストに示したように、わずか48種が知られるのみである。台湾の昆虫相は一般に日本のそれより多様性が高いので、日本産グンバイムシの既知種が約70種あることからみて、調査が進めば相当数の新発見があるものと期待される。