

A List of Lace Bugs (Hemiptera: Tingidae) Intercepted in Import Plant Inspections at Narita International Airport

Yasutaka NOTO¹⁾

Narita Sub-station Yokohama Plant Protection Station, 2159, Aza-Tennamino, Komaino, Narita 282-0021 Japan.

Abstract: A list of lace bugs intercepted in import plant inspections at Narita International Airport during the period 1997 to 2020 was presented. A total of 422 examined specimens comprised 42 species, including important pests not known to occur in Japan such as *Cochlochila bullita*, *Corythucha arcuata*, *Corythucha gossypii*, *Cysteoichila endeca*, *Galeatus scrophicus*, and *Monosteira uncostata*. Data of origin and inspected plants were provided for each species. In addition, dorsal habitus images of all 42 species with a focus stacking method were provided, as well as photographs of alive last-instar nymphs for several species.

Key Words: Cantacadelinae, Tinginae, plant quarantine, pest, tingid

Introduction

The lace bug (Hemiptera: Tingidae), including more than 2,600 species worldwide (Schuh & Weirauch, 2020), is a relatively large group of Heteroptera. All species are phytophagous (generally host-specific) and include several agricultural pests. Neal & Schaefer (2000) listed about 60 species as important or potential pests, which include seven occurring in Japan: *Corythucha ciliata* (Say), *C. marmorata* (Uhler), *Dulinius conchatus* Distant, *Metasalis populi* (Takeya), *Stephanitis pyrioides* (Scott), *S. takeyai* Drake & Maa, and *S. typica* (Distant).

Various insects, mites, and terrestrial gastropods have been intercepted in import plant inspections in Japan, and some were thoroughly examined and reported as lists: aphids (Sugimoto & Kitagawa, 1991, 1994; Sugimoto *et al.*, 2003), scale insects (Sugimoto *et al.*, 1996; Inoue *et al.*, 2006; Tokihiro, 2006), thrips (Hayase, 1991; Oda & Hayase, 1994; Masumoto *et al.*, 1999, 2003, 2005, 2012), fruit flies (Kamiji, 2012; Kamiji & Matsuura, 2022), leaf-miner flies (Kasugai *et al.*, 2001; Kamiji & Iwaizumi, 2013), moths and butterflies (Tokihiro, 1998; Takahashi *et al.*, 2003), powderpost beetles (Ueda, 1990), bark and ambrosia beetles (Sato, 1975; Ohno *et al.*, 1987, 1988a, 1988b, 1989; Ohno, 1990a, 1990b), weevils (Genka & Yoshitake, 2014, 2018a, 2018b; Yoshitake *et al.*, 2014, 2017), mites (Masaki, 1991, 2001; Kaneda & Masaki, 1994; Masaki & Kitamura, 2004), and slugs (Matsumoto & Kurozumi, 2004). These studies have been utilized for pest risk analysis because the species name is the most

fundamental element with which to start the analysis. However, there are no reports of Tingidae except for one species in a study of Australian Hemiptera intercepted at Japanese import plant quarantine (Tokihiro, 1999).

Narita International Airport (NRT, hereafter) is the largest air cargo logistics center in Japan, where various plants and plant products (including fruits, vegetables, and seeds) are imported from over 160 countries in various regions worldwide. Consequently, numerous insects are intercepted annually and preserved there. For example, Genka & Yoshitake (2018b) studied more than 4,300 weevil specimens intercepted at NRT from 1978 to 2016. There also are approximately 400 tingid specimens intercepted from 1997 to 2020, but most of them remain unidentified.

In this paper, I list all the specimens of lace bugs intercepted at NRT and overview their interception for contribution to pest risk analysis.

Materials and Methods

All examined specimens were intercepted in import plant inspections at NRT from 1997 to 2020 and preserved at the Narita Sub-station, Yokohama Plant Protection Station. The habitus images for each species were taken with an Olympus DP27 digital microscope camera attached to an Olympus SZX16 stereomicroscope. Each final image was assembled from a series of photographs with different focal planes, using CombineZP

¹⁾ Tokyo Sub-station, Yokohama Plant Protection Station

image stacking software (Hadley, 2010). During the period 2018 to 2020 all the nymphs intercepted were reared to obtain adults for identification. Data of emerged adults were included in the list, and the photographs of final instar nymphs were provided.

Results and Discussion

A total of 422 lace bug specimens comprised 42 species in two subfamilies, and 23 genera, of which 29 species were identified to species, 12 to genus, and one to subfamily. They included 34 species not occurring in Japan, six of which were named as important or potential pests by Neal & Schaefer (2000) and CABI (2020): *Cochlochila bullita* (Stål), *Corythucha arcuata* (Say), *Corythucha gossypii* (Fabricius), *Cysteochila endeca* Drake, *Galeatus scrophicus* Saunderson, and *Monosteira unicostata* (Mulsant & Rey). The most dominant species was *Chorotingis indigena* Drake, which was found on cut flowers of *Banksia* spp. from Australia and occupying 43% of all specimens. In addition, the following species were frequently intercepted: *G. scrophicus* (mainly on culinary herbs of Lamiaceae from Israel), *Malandiola* sp.1 (on cut flowers of *Chamaelirium* spp. from Australia), and *Tingis griseola* (Puton) (mainly on cut flowers of *Viburnum* spp. from Italy).

The species are listed below; arranged in alphabetical order with data of origin, inspected plants, and date of inspection for all examined specimens. An asterisk after the species name indicated that the species is not known to occur in Japan. The type of commodity of inspected plants was indicated as follows except where otherwise noted: botanical name for cut flowers, foliage, and branches, and English common name for fruit and vegetables. Samples which were found dead during import inspections were indicated as "dead sample(s)". The scientific name of Tingidae follows Drake & Ruhoff (1965) and the plant nomenclature follows The Plant List (2013).

A list of lace bugs intercepted in import plant inspections at Narita International Airport:

Family Tingidae

Subfamily Cantacaderinae

1. *Cantacader quinquecostatus* (Fieber) (Fig. 1)

Specimen examined: THAILAND: on betel pepper leaf (*Piper betle*), 1 ex., 19.XII.2011.

Note: The host plant of this species is unknown (Lis, 2003).

2. *Cnemiandrus typicus* Distant * (Fig. 2)

Specimen examined: SOUTH AFRICA: on *Leucadendron* sp., 1 ex., 17.XII.2015.

Notes: This species feeds on *Dicerotheramnus rhinocerotis*

(Compositae) (Göllner-Scheiding, 2004). The examined specimen was found on *Leucadendron* sp. (Proteaceae) which is not recorded as its host plant.

3. *Phatnoma* sp. 1 * (Figs. 3 & 43)

Specimens examined: SRI LANKA: on *Codiaeum* sp. (nursery), 1 ex., 5.XI.2020; on *Codiaeum* sp. (nursery), 1 ex. (nymph), 8.V.2020; on *Codiaeum* sp., 1 ex. (nymph), 25.VIII.2018; on *Codiaeum* sp., 1 ex., 19.XII.2016.

Notes: The species of the genus *Phatnoma* are quite similar and difficult to identify (Froeschner, 1996). I decided to leave the examined specimens unidentified until a large series of specimens of this genus becomes available.

4. *Phatnoma* sp. 2 * (Fig. 4)

Specimen examined: THAILAND: on leech lime leaf (*Citrus hystrix*), 1 ex., 14.XI.2013.

Note: The examined specimen remains unidentified for the same reason as the previous one.

5. *Sinalda* sp. * (Figs. 5 & 44)

Specimens examined: SOUTH AFRICA: on *Stoebe* sp., 3 exs., 16.XII.2018; on *Stoebe* sp., 2 exs. (nymphs), 2.XII.2018; on *Stoebe* sp., 1 ex., 26.III.2018.

Note: This species resembles *S. elegans* Distant but differs in terms of the following features: pronotum with median carina slightly projecting beyond the anterior margin of the collar and anterolateral angles of pronotum each with a minute projection.

6. *Cantacaderinae* gen. sp. * (Figs. 6 & 45)

Specimen examined: SOUTH AFRICA: on *Berzelia* sp., 1 ex. (nymph), 11.XII.2018.

Notes: This species falls into the genus *Ulmus* in the key of Froeschner (1996). However, it does not agree with the original description of the genus by Distant (1904), especially in the posterolateral angles of paranotum.

Subfamily Tinginae

7. *Agramma* sp. 1 * (Fig. 7)

Specimen examined: SOUTH AFRICA: on *Berzelia* sp., 1 ex., 14.XII.2015.

Notes: Twenty species of the genus *Agramma* are recorded from South Africa (Göllner-Scheiding, 2004). The examined specimen remains unidentified because I was unable to obtain sufficient literature.

8. *Agramma* sp. 2 * (Fig. 8)

Specimen examined: SOUTH AFRICA: on *Berzelia* sp., 1 ex., 8.X.2018.

Note: The examined specimen remains unidentified for the same reason as the previous one.

9. *Atheas nigricornis* Champion * (Fig. 9)

Specimens examined: **GUATEMALA:** on *Tillandsia* sp. (nursery), 1 ex., 22.III.2011; on *Tillandsia* sp. (nursery), 1 ex., 19.I.2011; on *Tillandsia* sp. (nursery), 1 ex., 9.II.2010.

Note: The examined specimens were found on *Tillandsia* spp. (Bromeliaceae), one of the host plants of this species (Miller, 2001).

10. *Belenus dentatus* (Fieber) (Fig. 10)

Specimen examined: **LAOS:** on sweet basil (*Ocimum basilicum*), 1 ex., 21.XI.2011.

Note: The host plant of this species is unknown (Yamada & Tomokuni, 2012).

11. *Ceratinoderma fornicata* Stål * (Fig. 11)

Specimen examined: **SOUTH AFRICA:** on *Brunia* sp., 1 ex., 8.XII.2016.

Note: The host plant of this species is unknown (Göllner-Scheiding, 2004).

12. *Chorotingis indigena* Drake * (Fig. 12)

Specimens examined: **AUSTRALIA:** on *Banksia* sp., 2 exs., 15.VII.2020; on *Banksia* sp., 6 exs., 20.III.2020; on *Banksia* sp., 1 ex., 13.III.2020; on *Banksia* sp., 3 exs., 6.III.2020; on *Banksia* sp., 1 ex., 9.X.2018; on *Banksia* sp., 1 ex., 3.VIII.2018; on *Banksia* sp., 1 ex., 15.VI.2018; on *Banksia* sp., 2 exs., 8.VI.2018; on *Banksia* sp., 1 ex., 25.V.2018; on *Banksia* sp., 2 exs., 11.V.2018; on *Banksia* sp., 2 exs., 30.III.2018; on *Banksia* sp., 1 ex., 23.III.2018; on *Banksia* sp., 1 ex., 20.X.2017; on *Banksia* sp., 4 exs., 6.X.2017; on *Banksia* sp., 1 ex., 10.VI.2017; on *Banksia* sp., 1 ex., 6.V.2017; on *Banksia* sp., 1 ex., 15.IV.2017; on *Banksia* sp., 3 exs., 8.IV.2017; on *Banksia* sp., 1 ex., 1.IV.2017; on *Banksia* sp., 1 ex., 25.III.2017; on *Banksia* sp., 3 exs., 4.III.2017; on *Banksia* sp., 1 ex., 25.II.2017; on *Banksia* sp., 1 ex., 25.IX.2016; on *Banksia* sp., 1 ex., 14.IX.2016; on *Banksia* sp., 2 exs., 30.VII.2016; on *Banksia* sp., 5 exs., 16.VII.2016; on *Banksia* sp., 2 exs., 9.VII.2016; on *Banksia* sp., 4 exs., 2.VII.2016; on *Banksia* sp., 3 exs., 25.VI.2016; on *Banksia* sp., 4 exs., 18.VI.2016; on *Banksia* sp., 1 ex., 11.VI.2016; on *Banksia* sp., 1 ex., 11.VI.2016; on *Banksia* sp., 3 exs., 4.VI.2016; on *Banksia* sp., 5 exs., 21.V.2016; on *Banksia* sp., 2 exs., 14.V.2016; on *Banksia* sp., 2 exs., 7.V.2016; on *Banksia* sp., 1 ex., 23.IV.2016; on *Banksia* sp., 1 ex., 16.IV.2016; on *Banksia* sp., 2 exs., 9.IV.2016; on *Banksia* sp., 2 exs., 2.IV.2016; on *Banksia* sp., 1 ex., 26.III.2016; on *Banksia* sp., 2 exs., 12.III.2016; on *Banksia* sp., 5 exs., 8.III.2016; on *Banksia* sp., 1 ex., 5.III.2016; on *Banksia* sp., 2 exs., 27.II.2016; on *Banksia* sp., 6 exs., 20.II.2016; on *Banksia* sp., 2

exs., 7.II.2016; on *Banksia* sp., 1 ex., 23.IX.2015; on *Banksia* sp., 2 exs., 19.VII.2015; on *Banksia* sp., 1 ex., 4.VII.2015; on *Banksia* sp., 1 ex., 27.VI.2015; on *Banksia* sp., 2 exs., 6.VI.2015; on *Banksia* sp., 5 exs., 30.V.2015; on *Banksia* sp., 1 ex., 16.V.2015; on *Banksia* sp., 1 ex., 19.III.2015; on *Banksia* sp., 1 ex., 18.I.2014; on *Banksia* sp., 1 ex., 13.IV.2013; on *Banksia* sp., 2 exs., 23.II.2013; on *Banksia* sp., 3 exs., 26.I.2013; on *Banksia* sp., 1 ex., 1.IX.2012; on *Banksia* sp., 1 ex., 9.VI.2012; on *Banksia* sp., 2 exs., 5.V.2012; on *Banksia* sp., 1 ex., 1.IV.2011; on *Banksia* sp., 4 exs., 26.III.2011; on *Banksia* sp., 6 exs., 22.I.2011; on *Banksia* sp., 6 exs., 15.I.2011; on *Banksia* sp., 1 ex., 8.I.2011; on *Banksia* sp., 8 exs., 19.VI.2010; on *Banksia* sp., 2 exs., 30.I.2010; on *Banksia* sp., 6 exs., 23.I.2010; on *Banksia* sp., 2 exs., 28.III.2009; on *Banksia* sp., 6 exs., 7.III.2009; on *Banksia* sp., 1 ex., 21.II.2009; on *Banksia* sp., 1 ex., 17.II.2007; on *Banksia* sp., 2 exs., 3.II.2007; on *Banksia* sp., 5 exs., 29.I.2007; on *Banksia* sp., 2 exs., 18.IX.2002; on *Banksia* sp., 1 ex., 4.IV.2001; on *Banksia* sp., 1 ex., 14.IV.1997; on *Banksia* sp., 2 exs., 30.IV.1997.

Notes: The host plant of this species is unknown (Drake & Ruhoff, 1965). All the examined specimens were found on *Banksia* spp. (Proteaceae). This is the most frequently intercepted lace bug in import plant quarantine.

13. *Cochlochila austroafricana* Rodrigues * (Fig. 13)

Specimens examined: **SOUTH AFRICA:** on *Pteronia* sp., 2 exs., 15.XI.2000.

Note: The host plant of this species is unknown (Deckert & Göllner-Scheiding, 2006).

14. *Cochlochila bullita* (Stål) * (Fig. 14)

Specimens examined: **LAOS:** on holy basil (*Ocimum tenuiflorum*), 1 ex., 26.VII.2010; on basil (*Ocimum* sp.), 1 ex., 6.VI.2005.

THAILAND: on holy basil, 1 ex., 14.I.2003; on sweet basil (*Ocimum basilicum*), 1 ex., 11.II.2020.

Note: This species is a pest of *Carthamus tinctorius* (Compositae), *Ocimum* spp., *Metha* spp., *Rosmarinus officinalis*, and *Salvia officinalis* (Lamiaceae) (Neal & Schaefer, 2000).

15. *Cochlochila* sp. * (Fig. 15)

Specimen examined: **SOUTH AFRICA:** on *Leucadendron* sp., 1 ex. (dead sample), 9.XII.2018.

Note: This species resembles *C. zetana* Drake but differs due to the outer edge of the pronotal membranes not concealing the lateral carinae.

16. *Corythucha arcuata* (Say) * (Fig. 16)

Specimens examined: **ITALY:** on *Hedera* sp., 31 exs., 4.XII.2015; on *Hedera* sp., 2 exs., 3.XII.2015.

Notes: This North American lace bug was found for the first time in 2000 in Italy and has currently spread to adjacent countries

(Zúbrik *et al.*, 2019). This species is a pest of oak (*Quercus* spp.) (Fagaceae) (CABI, 2020). The examined specimens were found on *Hedera* spp. (Araliaceae), which are not recorded as its host plant.

17. *Corythucha ciliata* (Say) (Fig. 17)

Specimens examined: **KOREA**: on perilla (*Perilla frutescens*), 1 ex., 30.VI.2009. **ITALY**: on *Viburnum* sp., 1 ex., 18.XI.2013.

Notes: This North American lace bug was introduced throughout Europe (Neal & Schaefer, 2000) and was first reported in Japan in 2001 (Tokihiro *et al.*, 2003). This species is a pest of *Platanus occidentalis* (Platanaceae) (Neal & Schaefer, 2000).

18. *Corythucha gossypii* (Fabricius) * (Fig. 18)

Specimens examined: **FIJI**: on pod of moringa (*Moringa oleifera*), 1 ex., 5.XI.2019.

Notes: This species is a pest of beans and cotton (Neal & Schaefer, 2000). The examined specimen was found on *Moringa oleifera*, which is not recorded as its host plant. This species, native to New World and introduced into Hawaii (Miller & Nagamine, 2005), was recorded from Fiji (Jackson, 2019).

19. *Corythucha marmorata* (Uhler) (Fig. 19)

Specimens examined: **VIETNAM**: on *Chrysanthemum* sp. (nursery), 1 ex., 26.IX.2017. **U.S.A.**: on asparagus (*Asparagus officinalis*), 1 ex., 19.V.2011; on lettuce (*Lactuca sativa*), 1 ex., 4.V.2015. **MEXICO**: on welsh onion (*Allium fistulosum*), 1 ex., 24.VI.2013.

Notes: This North American lace bug was introduced into Japan in 2000 (Yamada & Tomokuni, 2012). This species is a pest of several Compositae plants (Neal & Schaefer, 2000).

20. *Corythucha salicata* Gibson * (Fig. 20)

Specimens examined: **U.S.A.**: on mustard (*Brassica juncea*), 1 ex., 22.X.2012; on mustard, 1 ex., 5.VII.2001.

Notes: This species feeds on *Populus* spp. and *Salix* spp. (Salicaceae) (Drake & Ruhoff, 1965; Rodstrom & Brown, 2017). The examined specimens were found on *Brassica juncea* (Brassicaceae) which is not recorded as its host plant.

21. *Cysteochila endeca* Drake * (Fig. 21)

Specimen examined: **ZIMBABWE**: on *Leucospermum* sp., 1 ex. (dead sample), 16.IX.2018.

Notes: This species is a pest of *Tamarindus indica* (Leguminosae) (Neal & Schaefer, 2000).

22. *Cysteochila* sp. 1 * (Fig. 22)

Specimens examined: **AUSTRALIA**: on *Grevillea* sp., 2 exs. (dead samples), 23.XII.2003.

Note: This species is very similar to *C. hacker* Drake but differs

in terms of the following features: head with relatively long and upstanding five spines, and costal area not very narrow.

23. *Cysteochila* sp. 2 * (Fig. 23)

Specimen examined: **ZIMBABWE**: on *Anigozanthos* sp., 1 ex., 26.XI.2011.

Note: This examined specimen remains unidentified because I was unable to obtain sufficient literature.

24. *Cysteochila* sp. 3 * (Fig. 24)

Specimen examined: **SOUTH AFRICA**: on *Phylica* sp., 1 ex., 30.VI.2019.

Note: The examined specimen is very similar to *C. sordida* (Stål), but I left it unidentified due to poor condition (both antennae missing).

25. *Dulinius conchatus* Distant (Fig. 25)

Specimens examined: **THAILAND**: on morinda leaf (*Morinda citrifolia*), 1 ex., 24.V.2007; on morinda leaf, 1 ex., 27.VIII.2002; on morinda leaf, 2 exs., 25.III.2002; on morinda leaf, 2 exs., 21.VI.2001; on morinda leaf, 1 ex., 11.VI.2001; on morinda leaf, 1 ex., 22.III.2001; on morinda leaf, 1 ex., 11.V.2000; on morinda leaf, 1 ex., 10.V.1999; on betel pepper leaf (*Piper betle*), 1 ex., 5.X.2000.

Notes: This Oriental species was introduced into Japan in 1996 (Tomokuni & Saito, 1998). This species is a pest of *Morinda* sp. and *Paederia foetida* (Rubiaceae) (Neal & Schaefer, 2000).

26. *Epimixia dysmica* Drake & Ruhoff * (Fig. 26)

Specimens examined: **AUSTRALIA**: on *Allocasuarina* sp., 3 exs. (dead samples), 29.II.2009.

Notes: This species feeds on *Allocasuarina* spp. (Casuarinaceae) (Cassis *et al.*, 2019). The examined specimens were found on the plant.

27. *Epimixia veteris* Drake * (Fig. 27)

Specimens examined: **AUSTRALIA**: on *Allocasuarina* sp., 1 ex. (dead sample), 29.II.2009; on *Allocasuarina* sp., 1 ex., 26.X.2007.

Notes: This species feeds on *Allocasuarina* spp. (Casuarinaceae) (Cassis *et al.*, 2019). The examined specimens were found on the plant.

28. *Epimixia vittata* Horváth * (Fig. 28)

Specimens examined: **AUSTRALIA**: on *Allocasuarina* sp., 1 ex. (dead sample), 29.II.2009; on *Allocasuarina* sp., 1 ex., 26.X.2007.

Notes: This species feeds on *Allocasuarina* spp. (Casuarinaceae) (Cassis *et al.*, 2019). The examined specimens were found on the plant.

29. *Euahanes inflatus* Distant * (Fig. 29)

Specimen examined: **SOUTH AFRICA**: on *Brunia* sp., 1 ex.,

14.XII.2004.

Note: The host plant of this species is unknown (Göllner-Scheiding, 2004).

30. *Galeatus scrophicus* Soudners * (Fig. 30)

Specimens examined: **ISRAEL:** on rosemary (*Rosmarinus officinalis*), 1 ex., 17.XI.2017; on rosemary, 2 exs., 27.III.2017; on rosemary, 1 ex., 28.II.2017; on rosemary, 3 exs., 26.II.2017; on rosemary, 1 ex., 25.II.2017; on rosemary, 1 ex., 18.II.2017; on rosemary, 1 ex., 15.II.2017; on rosemary, 1 ex., 11.II.2017; on rosemary, 1 ex., 2.II.2017. on rosemary, 2 exs., 28.I.2017; on rosemary, 5 exs., 20.I.2017; on rosemary, 1 ex., 12.I.2017; on rosemary, 1 ex., 19.XII.2016; on rosemary, 1 ex., 19.XI.2016; on rosemary, 1 ex., 12.XI.2016; on rosemary, 11 exs., 10.XII.2011; on rosemary, 1 ex., 7.XII.2011; on sage (*Salvia officinalis*), 1 ex., 12.VII.2016; on thyme (*Thymus vulgaris*), 1 ex., 23.XI.2017; on thyme, 1 ex., 26.XI.2016; on thyme, 1 ex., 20.XI.2016; on thyme, 1 ex., 9.I.2013. **KENYA:** on rosemary, 3 exs., 9.XII.2018.

Notes: This species is a pest of *Chrysanthemum* spp. and *Helianthus annuus* (Compositae) (Neal & Schaefer, 2000). The examined specimens were found on *Rosmarinus officinalis*, *Salvia officinalis*, and *Thymus vulgaris* (Lamiaceae) which are not recorded as its host plants. This is the second most frequently intercepted lace bug in import plant quarantine.

31. *Inoma* sp. * (Fig. 31)

Specimen examined: **AUSTRALIA:** on *Lachnostachys* sp., 1 ex., 26.IX.2001.

Notes: This Australian endemic genus was revised by Cassis & Symonds (2008) and currently comprises nine species. This species can be distinguished from its congeners by the combination of the following features: body covered with hair-like setae, and paranota and costal area uniseriate.

32. *Malandiola semota* Drake * (Fig. 32)

Specimens examined: **AUSTRALIA:** on *Thryptomene* sp., 2 exs., 15.VII.2020.

Notes: This species feeds on *Thryptomene* sp. (Myrtaceae) (Drake & Ruhoff, 1965). The examined specimens were found on the plant.

33. *Malandiola* sp. 1 * (Figs. 33 & 46)

Specimens examined: **AUSTRALIA:** on *Chamelaucium* sp., 1 ex., 14.VIII.2020; on *Chamelaucium* sp., 2 exs., 14.VIII.2019; on *Chamelaucium* sp., 2 exs. (nymphs), 13.XI.2018; on *Chamelaucium* sp., 1 ex., 21.XI.2017; on *Chamelaucium* sp., 1 ex., 11.VI.2016; on *Chamelaucium* sp., 1 ex., 2.IX.2015; on *Chamelaucium* sp., 3 exs., 16.XI.2013; on *Chamelaucium* sp., 1 ex., 20.VII.2013; on *Chamelaucium* sp., 1 ex., 9.XI.2011; on *Chamelaucium* sp., 4 exs., 16.XI.2010; on *Chamelaucium* sp., 1

ex., 24.VII.2009; on *Chamelaucium* sp., 1 ex., 17.XI.2008; on *Chamelaucium* sp., 2 exs., 19.IX.2008; on *Chamelaucium* sp., 2 exs., 11.IX.2008; on *Chamelaucium* sp., 5 exs., 4.IX.2008; on *Chamelaucium* sp., 5 exs. (dead samples), 20.X.2005; on *Chamelaucium* sp., 2 exs. (dead samples), 14.X.2005; on *Chamelaucium* sp., 2 exs., 9.IX.2005; on *Chamelaucium* sp., 1 ex., 2.IX.2003; on *Chamelaucium* sp., 1 ex., 29.X.2002.

Notes: This genus is endemic to Australia with six species (Drake & Ruhoff, 1965). This species can be distinguished from its congeners by the combination of the following features: body extremely large (3.4mm long in average), head with frontal and occipital spines, and metasternal laminae rather separated.

34. *Malandiola* sp. 2 * (Fig. 34)

Specimen examined: **AUSTRALIA:** on *Sholtzia* sp., 1 ex. (dead sample), 15.XII.2017.

Note: This species is somewhat similar to *M. syscena* Drake & Ruhoff but can be distinguished by the labium long and exceeding middle of metasternum, and the metasternal laminae parallel.

35. *Monosteira unicostata* (Mulsant & Rey) * (Fig. 35)

Specimens examined: **ITALY:** on *Grevillea* sp., 2 exs., 21.XI.2020; on *Viburnum* sp., 1 ex., 13.IX.2020; on *Acacia* sp., 1 ex., 14.II.2019; on *Danae racemosa*, 1 ex., 1.X.2004; on *Grevillea* sp., 1 ex., 31.X.2019; on *Grevillea* sp., 1 ex. (dead sample), 17.XI.2017; on *Viburnum* sp., 1 ex., 11.V.2017; on *Viburnum* sp., 1 ex., 13.I.2011; on *Viburnum* sp., 1 ex., 18.XI.2010; on *Viburnum* sp., 1 ex., 23.IV.2008.

Notes: This European species was introduced into Canada (Scudder, 2013), Argentina (Carpintero *et al.*, 2017), and Chile (Campodonico *et al.*, 2021). This species is a pest of Rosaceae fruit trees (Neal & Schaefer, 2000). The examined specimens were found on *Acacia* sp. (Leguminosae), *Danae racemosa* (Asparagaceae), *Grevillea* spp. (Proteaceae), and *Viburnum* spp. (Adoxaceae) which are not recorded as its host plants.

36. *Pontanus accedens* (Drake) * (Fig. 36)

Specimens examined: **AUSTRALIA:** on *Leucadendron* sp., 1 ex. (dead sample), 25.XI.2012; on *Leucadendron* sp., 1 ex., 2.XI.2008; on *Leucadendron* sp., 1 ex., 25.XI.2002.

Note: The host plant of this species is unknown (Cassis & Gross, 1995).

37. *Sanazarius cuneatus* Distant * (Fig. 37)

Specimens examined: **SOUTH AFRICA:** on *Metalasia* sp., 1 ex., 14.II.2020; on *Metalasia* sp., 1 ex., 5.V.2019; on *Metalasia* sp., 1 ex., 11.II.2019; on *Phaenocoma* sp., 1 ex., 17.XI.2017; on *Phaenocoma* sp., 1 ex., 7.XII.2003; on *Phaenocoma* sp., 2 exs., 2.II.2002; on *Stoebe* sp., 2 exs. (dead samples), 16.XII.2018.

Notes: This species feeds on *Lobostemon argenteus* (Boraginaceae)

(Göllner-Scheiding, 2004). The examined specimens were found on *Metalasia* spp., *Phaenocoma* spp., and *Stoebe* sp. (Compositae) which are not recorded as its host plants.

38. *Stephanitis nashi* Esaki & Takeya (Fig. 38)

Specimen examined: CHINA: on perilla (*Perilla* sp.), 1 ex., 8.X.2018.

Note: This species is a pest of *Pyrus pyrifolia* (Rosaceae) (Inoue, 2003).

39. *Stephanitis pyrioides* (Scott) (Fig. 39)

Specimen examined: TAIWAN: on *Cordyline* sp., 1 ex., 29.V.2012.

Note: This species is a pest of *Rhododendron* spp. (Ericaceae) (Neal & Schaefer, 2000).

40. *Stephanitis typica* (Distant) (Fig. 40)

Specimens examined: THAILAND: on banana leaf (*Musa* sp.), 1 ex. (dead sample), 10.V.2020; on banana leaf, 1 ex. (dead sample), 6.XI.2018; on banana leaf, 1 ex., 23.X.2018; on banana leaf, 2 exs., 11.II.2017; on *Dendrobium* sp., 1 ex., 6.VI.2007; on *Dendrobium* sp., 1 ex. (dead sample), 9.VI.2003; on *Hydrangea* sp., 2 exs., 20.II.2014. SINGAPORE: on *Alpinia* sp., 1 ex., 6.VI.2007.

Note: This species is a pest of *Musa* sp. (Musaceae), *Cocos nucifera* (Arecaceae), and various members of the Zingiberaceae (Neal & Schaefer, 2000).

41. *Tingis cardui* (Linnaeus) * (Fig. 41)

Specimen examined: ITALY: on *Cupressus* sp., 1 ex., ??XI.1997.

Notes: This species feeds on *Carduus* spp. and *Cirsium* spp. (Compositae) (Drake & Ruhoff, 1965; Péricart, 1983). The examined specimen was found on *Cupressus* sp. (Cupressaceae) which is not recorded as its host plant.

42. *Tingis griseola* (Puton) * (Fig. 42)

Specimens examined: ITALY: on *Viburnum* sp., 1 ex., 16.X.2020; on *Viburnum* sp., 1 ex., 29.VIII.2020; on *Viburnum* sp., 1 ex., 22.VIII.2020; on *Viburnum* sp., 1 ex., 20.X.2019; on *Viburnum* sp., 1 ex., 25.VII.2019; on *Viburnum* sp., 1 ex., 9.IX.2018; on *Viburnum* sp., 1 ex., 12.VIII.2018; on *Viburnum* sp., 1 ex., 27.IX.2017; on *Viburnum* sp., 1 ex., 9.VII.2017; on *Viburnum* sp., 1 ex., 11.X.2015; on *Viburnum* sp., 1 ex., 24.VII.2015; on *Viburnum* sp., 2 exs., 19.IX.2013; on *Viburnum* sp., 1 ex., 4.I.2013; on *Viburnum* sp., 1 ex., 2.VIII.2012; on *Viburnum* sp., 2 exs., 10.X.2011; on *Viburnum* sp., 1 ex., 25.IX.2010; on *Hedera* sp., 1 ex., 21.X.2009; on *Viburnum* sp., 1 ex., 6.X.2005; on *Viburnum* sp., 1 ex., 25.IX.2005. TURKEY: on wreath, 1 ex., 17.XI.2010.

Notes: This species feeds on *Juniperus* sp. (Cupressaceae) (Drake & Ruhoff, 1965). Most of the examined specimens were found on *Viburnum* spp. (Adoxaceae) which are not recorded as its host plant.

Acknowledgements

I would like to thank Jun Souma (Entomological Laboratory, Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University) for his valuable advice and incisive comments. I also thank Yoshinori Seino (Narita Sub-station Yokohama Plant Protection Station) for providing useful references. I am deeply grateful to Masaaki Genka and Hiroaki Shigetoh (Yokohama Plant Protection Station) for kindly reviewing the manuscript and offering various helpful comments for its improvement.

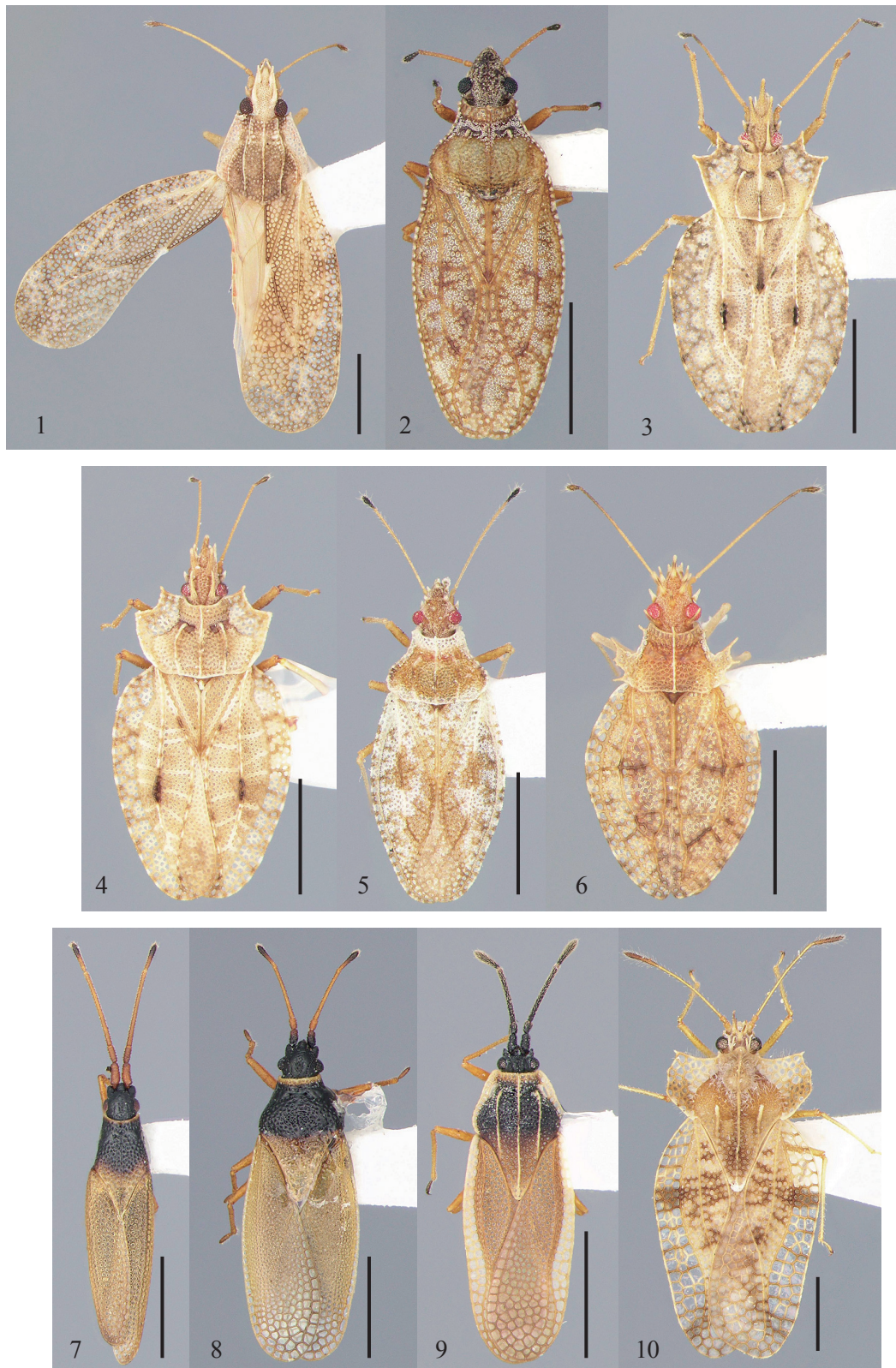
References

- Aukema, B., C. Rieger & W. Rabitsch (2013) *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 6. Supplement*. The Netherlands Entomological Society, Amsterdam, Netherlands: xxiv + 629 pp.
- Blatchley, W. S. (1926) *Heteroptera or true bugs of eastern North America, with especial reference to the faunas of Indiana and Florida*. The Nature Publishing Company, Indianapolis, U.S.A.: 1116 pp.
- CABI (2020) Crop Protection Compendium (online), available from <https://www.cabi.org/cpc/>, (accessed 2020-06-22)
- Campodonico, J. F., A. Fierro, S. Rothmann (2021) Presence of *Monosteira unicostata* (Mulsant and Rey, 1852) (Hemiptera: Tingidae) in Chile. *Rev. Chil. Entomol.*, **47**(1): 101-104. [in Spanish]
- Carpintero, D. L., R. J. López Plantey, V. N. Quiroga & M. G. Holgado (2017) First appointment of *Monosteira unicostata* (Mulsant & Rey, 1852) (Hemiptera: Tingidae) for Argentina, found in Mendoza province. *Historia natural*, **7**(1): 121-127. [in Spanish]
- Cassis, G. & C. Symonds (2008) Systematics, biogeography and host associations of the lace bug genus *Inoma* (Hemiptera: Heteroptera: Tingidae). *Acta Entomol. Mus. Natl. Pragae*, **48**(2): 433-484.
- Cassis, G. & G. F. Gross (1995) Hemiptera: Heteroptera (Coleorrhyncha to Cimicomorpha) In *Zoological Catalogue of Australia. Vol. 27.3A*. (Houston, W. W. K. & G. V. Maynard eds.). CSIRO, Canberra, Australia: 506 pp.
- Cassis, G., C. Symonds & L. Branson (2019) Systematics and species radiation of the sheoak lace bug genus *Epimixia* Kirkaldy (Insecta : Heteroptera : Tingidae) in Australia, New Caledonia and Papua New Guinea. *Invertebr. Syst.*, **33**: 277-366.
- Deckert, J. & U. Göllner-Scheiding (2006) Lace bugs of Namibia (Heteroptera, Tingidae). *Denisia*, **19**(50): 823-856.
- Distant, W. L. (1904) On South African Tingididae and other Heteropterous Rhynchota. *Trans. R. Soc. S. Afr.*, **14**: 425-436.

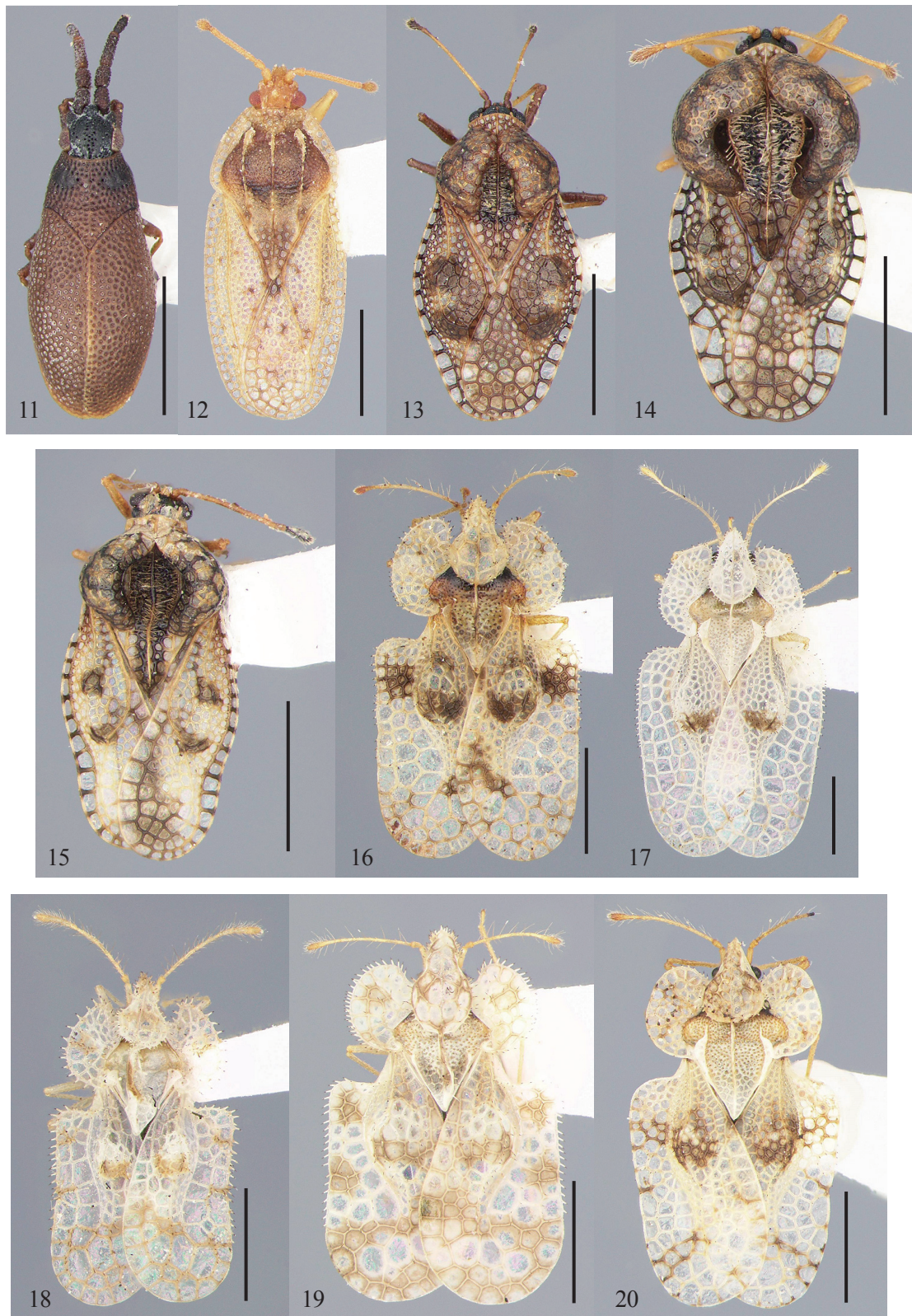
- Distant, W. L. (1902) Rhynchotal Miscellanea. *Ann. S. Afr. Mus.*, **2**: 237-254.
- Distant, W. L. (1909) New Oriental Tingididae. *Ann. Soc. Ent. Belg.*, **53**: 113-123.
- Distant, W.L. (1902) *The fauna of British India, including Ceylon and Burma. Rhynchota 2 (Heteroptera)*. Taylor & Francis, London, Britain: 503 pp.
- Drake, C. J. (1918) A new corn insect from California (Heteroptera). *J. Econ. Entomol.*, **11**(4): 385.
- Drake, C. J. (1939) Three new species of Tingitidae (Hemiptera) from Australia. *Pan-Pac. Entomol.*, **15**(2): 87-88.
- Drake, C. J. (1942) New Australian Tingitidae (Hemiptera). *J. Wash. Acad. Sci.*, **32**(12): 359-364.
- Drake, C. J. (1947) Australian Tingidae (Hemiptera). *Bull. South. Calif. Acad. Sci.*, **46**(3), 111-121
- Drake, C. J. (1954) A miscellany of new Tingidae (Hemiptera). *Proc. Biol. Soc. Wash.*, **67**: 1-16.
- Drake, C. J. (1954) New genera and species of Tingidae from the Old World (Hemiptera). *Philipp. J. Sci.*, **83**: 69-73.
- Drake, C. J. (1954) Tingidae: descriptions and synonymic data (Hemiptera), *Great Basin Nat.*, **14**(1-2): 1-10.
- Drake, C. J. (1956) New African and Asian Tingidae (Hemiptera). *Great Basin Nat.*, **16**: 18-22.
- Drake, C. J. (1961) Some Australian Tingidae (Hemiptera), including new genera and new species. *Rec. Aust. Mus.*, **25**(6): 107-114.
- Drake, C. J. & T. Maa (1955) Chinese and other Oriental Tingoidea (Hemiptera) Part III. *Q. J. Taiwan Mus.*, **8**(1): 1-11.
- Drake, C. J. & F. A. Ruhoff (1961) The genus *Epimixia* Kirkaldy (Hemiptera: Tingidae). *Trans. Royal Soc. New Zeal. Zool.*, **1**: 1-6.
- Drake, C. J. & F. A. Ruhoff (1961) New genera and new species of lacebugs from the eastern hemisphere (Hemiptera: Tingidae). *Proc. U. S. Natl. Mus.*, **113**(3455): 125-183.
- Drake, C. J. & F. A. Ruhoff (1965) Lace bugs of the world, a catalog (Hemiptera: Tingidae). *Bull. Am. Mus. Nat. Hist.*, **243**: 1-634.
- Duarte-Rodrigues, P. (1981) African Tingidae. XVII: Eleven new species, new synonyms and new data of *Cysteochila* Stål (Heteroptera). *EOS, Rev. Esp. Entomol.*, **57**: 69-90.
- Duarte-Rodrigues, P. (1982) African Tingidae, XXI: Lacebugs in the British museum (Natural History) (Heteroptera). *Arq. Mus. Bocage Nova Ser. C, Suppl.*, **1**(5): 133-200.
- Duarte-Rodrigues, P. (1982) African Tingidae, XXII: Lacebugs in the plant protection research institute (Pretoria) (Heteroptera). *Arq. Mus. Bocage Nova Ser. C, Suppl.*, **1**(6): 201-253.
- Duarte-Rodrigues, P. (1982) *Cochlochila* Stål (Heteroptera): descriptions of a new subgenus and nine new species (African Tingidae XXVII). *J. Entomol. Soc. South Afr.*, **45**(2): 163-181.
- Duarte-Rodrigues, P. (1987) African Tingidae, XVIII three new species and new data from south and south west Africa (Heteroptera), *Arq. Mus. Bocage Nova Ser. B*, **2**(21): 175-185.
- Duarte-Rodrigues, P. (1987) New species and records of lacebugs (Heteroptera: Tingidae) from southern Africa. *Ann. Transvaal Mus.*, **34**(16): 349-369.
- Duarte-Rodrigues, P. (1990) African Tingidae, XLVII Nine new species and new data from southern Africa (Heteroptera). *Arq. Mus. Bocage (N. S.)*, **1**(44): 625-659.
- Esaki, T. & C. Takeya (1931) Identification of a Japanese tingitid injurious to the pear tree. *Mushi*, **4**: 51-59.
- Froeschner, R. C. (1968) Notes on the systematics and morphology of the Lacebug subfamily Cantacaderinae. *Proc. Entomol. Soc. Wash.*, **70**: 245-254.
- Froeschner, R. C. (1996) Lace bug genera of the world, I: Introduction, subfamily Cantacaderinae (Heteroptera: Tingidae). *Smithson. Contr. Zool.*, **574**: 1-43.
- Froeschner, R. C. (2001) Lace bug genera of the world, II: subfamily Tinginae: tribes Litadeini and Ypsotingini (Heteroptera: Tingidae). *Smithson. Contr. Zool.*, **611**: 1-28.
- Genka, M. & H. Yoshitake (2014) Chronological change of taxonomic composition of exotic weevils (Coleoptera: Curculionoidea) intercepted by Japanese Plant Quarantine. *Res. Bull. Pl. Prot. Japan*, **50**: 17-46. [in Japanese.]
- Genka, M. & H. Yoshitake (2018a) A list of Metapocyrtus weevils (Coleoptera, Curculionidae, Entiminae) intercepted at import plant quarantine in Japan, with descriptions of two new species. *Elytra, (new series)*, **8** (2): 249-262.
- Genka, M. & H. Yoshitake (2018b) Chronological change of taxonomic composition of exotic weevils (Coleoptera: Curculionoidea) intercepted in import plant quarantine at Narita International Airport. *Res. Bull. Pl. Prot. Japan*, **54**: 1-47. [in Japanese]
- Gibson, E. H. (1918) The genus *Corythucha* Stål (Tingidae: Heteroptera). *Trans. Am. Entomol. Soc.*, **44**: 69-104.
- Göllner-Scheiding, U. (2004) Die Tingidae (Netzwanzen) der Äthiopis (Insecta, Heteroptera: Tingoidea) : Katalog der afrikanischen Arten. *Nova Suppl. Entomol.*, **17**: 1-173.
- Hacker, H. (1927) New Tingitoidea (Hemiptera) in the Queensland museum. *Mem. Queensl. Mus.*, **9**(2): 174-188.
- Hadley, A. (2010) Combine ZP. (online), <<http://www.hadleyweb.pwp.blueyonder.co.uk/>> , (accessed 2020-02-12) currently available from <<https://combinezp.software.informer.com/>>
- Hayase, T. (1991) A list of thrips (Thysanoptera) intercepted in plant quarantine. *Res. Bull. Pl. Prot. Japan*, **27**: 93-99. [in Japanese]
- Horváth, G. (1906) Synopsis Tingitidarum regionis Palaearcticae. *Annls hist.-nat. Mus. natn. hung.*, **4**: 1-118.
- Horváth, G. (1912) Species generis Tingitidarum *Stephanitis*. *Annls hist.-nat. Mus. natn. hung.*, **10**: 319-339.
- Horváth, G. (1925) Results of Dr. E. Mjöberg's Swedish scientific

- expeditions to Australia 1910–1913. 45. Tingitidae. *Ark. zool.*, **17**(24): 1-17.
- Inoue, K. (2003) In *Agricultural insect pests in Japan*. (Umeya, K. and T. Okada, eds.). Zenkoku Noson Kyoiku Kyokai, Tokyo, Japan: 386. [in Japanese]
- Inoue, T., G. Tokihiro, G. Takahashi & Y. Tatematsu (2006) A list of intercepted scales (Homoptera: Coccoidea) in imported plants at the plant quarantine of Narita Airport. *Res. Bull. Pl. Prot. Japan*, **42**: 51-57. [in Japanese]
- Jackson, G. (2019) Pacific Pest, Pathogens & Weeds. (online), available from https://apps.lucidcentral.org/pppw_v10/text/web_full/entities/bean_lace_bug_253.htm, (accessed 2021-10-01).
- Kamiji, T. (2012) Fruit flies (Diptera: Tephritidae) intercepted by Japanese import plant quarantine at Narita International Airport. *Res. Bull. Pl. Prot. Japan*, **48**: 33-42.
- Kamiji, T. & H. Matsuura (2022) An illustrated key and annotated list of species of the subfamilies Phytalmiinae and Tephritinae (Diptera: Tephritidae) detected in Japanese quarantine. *J. Asia Pac. Biodivers.*, **15**(2): 196-217.
- Kamiji, T. & R. Iwaizumi (2013) Four species of Agromyzidae (Diptera) intercepted by Japanese import plant quarantine. *Res. Bull. Pl. Prot. Japan*, **49**: 53-61.
- Kaneda, M. & M. Masaki (1994) A supplementary list of Acarina intercepted in plant quarantine. *Res. Bull. Pl. Prot. Japan*, **30**: 125-126. [in Japanese]
- Kasugai, K., R. Iwaizumi, M. Kumagai & T. Tsuchiya (2001) Agromyzidae (Diptera: Agromyzidae) detected in the import plant quarantine of Japan. *Res. Bull. Pl. Prot. Japan*, **37**: 105-109. [in Japanese]
- Linnavuori, R. (1977) Hemiptera of the Sudan, with remarks on some species of the adjacent countries 5. Tingidae, Piesmididae, Cydnidae, Thaumastellidae and Plataspidae. *Acta Zool. Fenn.*, **147**: 1-81.
- Lis, B. (2003) Revision of the genus *Cantacader* Amyot et Serville, 1843 (Hemiptera: Heteroptera: Cantacaderidae). *Pol. pis. entomol.*, **72** (supplement): 1-222.
- Masaki, M. (1991) A list of Acarina intercepted in plant quarantine. *Res. Bull. Pl. Prot. Japan*, **27**: 87-92. [in Japanese]
- Masaki, M. (2001) Note on the some tetranychid mites on the Thai plants intercepted at Narita airport in Japan. *Res. Bull. Pl. Prot. Japan*, **37**: 111-116. [in Japanese]
- Masaki, M. & H. Kitamura (2004) A list of intercepted tetranychoid mites (Acari: Tetranychoidae) on imported plants at the plant quarantine of Narita Airport. *Res. Bull. Pl. Prot. Japan*, **40**: 119-125. [in Japanese]
- Masumoto, M., G. Takahashi, T. Kawai, K. Minoura, Y. Oda & T. Hayase (2005) Additional list of thrips (Thysanoptera) intercepted at Japanese plant quarantine. *Res. Bull. Pl. Prot. Japan*, **41**: 75-78. [in Japanese]
- Masumoto, M., K. Minoura and K. Fujimoto (2012) Additional list of thrips (Thysanoptera) intercepted by Japanese plant quarantine [V]. *Res. Bull. Pl. Prot. Japan*, **48**: 43-53.
- Masumoto, M., Y. Oda & T. Hayase (1999) Additional list of thrips (Thysanoptera) intercepted in plant quarantine. *Res. Bull. Pl. Prot. Japan*, **35**: 149-150. [in Japanese]
- Masumoto, M., Y. Oda & T. Hayase (2003) Additional list of thrips (Thysanoptera) intercepted at plant quarantine of Japan III. *Res. Bull. Pl. Prot. Japan*, **39**: 89-92. [in Japanese]
- Matsumoto, N. & T. Kurozumi (2004) A list of slugs (Gastropoda: Pulmonata) intercepted at plant quarantine in Japan. *Res. Bull. Pl. Prot. Japan*, **40**: 127-133.
- Miller, L. T. (2001) A taxonomic study of the genus *Atheas* Champion (Heteroptera: Tingidae). *Insecta Mundi*, **15**(3): 167-179.
- Miller, L. T. & T. Nagamine (2005) First records of *Corythucha gossypii* (Hemiptera: Tingidae) in Hawaii, including notes on host plants. *Proc. Hawaii. Entomol. Soc.*, **37**: 85-88.
- Neal, J. W., Jr. & C. W. Schaefer (2000) Lace Bugs (Tingidae). In *Heteroptera of Economic Importance* (Schaefer, C. W. & A. R. Panizzi, eds.). CRC Press, Boca Raton, U.S.A.: 85-137.
- Oda, Y. & T. Hayase (1994) Additional list of thrips (Thysanoptera) intercepted in plant quarantine. *Res. Bull. Pl. Prot. Japan*, **30**: 123-124. [in Japanese]
- Ohno, S. (1990a) The Scolytidae and Platypodidae (Coleoptera) from Borneo found in logs at Nagoya Port I. *Res. Bull. Pl. Prot. Japan*, **26**: 83-94.
- Ohno, S. (1990b) The Scolytidae and Platypodidae (Coleoptera) from Borneo found in logs at Nagoya Port II. *Res. Bull. Pl. Prot. Japan*, **26**: 95-103.
- Ohno, S., K. Yoneyama, H. Nakazawa & K. Yoshioka (1987) The Scolytidae and Platypodidae (Coleoptera) from Philippines, found in logs at Nagoya port. *Res. Bull. Pl. Prot. Japan*, **23**: 87-91.
- Ohno, S., K. Yoneyama & H. Nakazawa (1987) The Scolytidae and Platypodidae (Coleoptera) from Molucca Islands, found in logs at Nagoya port. *Res. Bull. Pl. Prot. Japan*, **23**: 93-97.
- Ohno, S., K. Yoshioka, K. Yoneyama & H. Nakazawa (1988a) The Scolytidae and Platypodidae (Coleoptera) from Solomon Islands, found in logs at Nagoya port, I. *Res. Bull. Pl. Prot. Japan*, **24**: 91-95.
- Ohno, S., K. Yoshioka, K. Yoneyama & H. Nakazawa (1988b) The Scolytidae and Platypodidae (Coleoptera) from Solomon Islands, found in logs at Nagoya port, II. *Res. Bull. Pl. Prot. Japan*, **24**: 97-99.
- Ohno, S., K. Yoshioka, N. Uchida, K. Yoneyama & K. Tsukamoto (1989) The Scolytidae and Platypodidae (Coleoptera) from Bismarck Archipelago found in logs at Nagoya port. *Res. Bull. Pl. Prot. Japan*, **25**: 59-69.
- Önder, F. & N. Lodos (1977) A new species of *Galeatus* Curtis

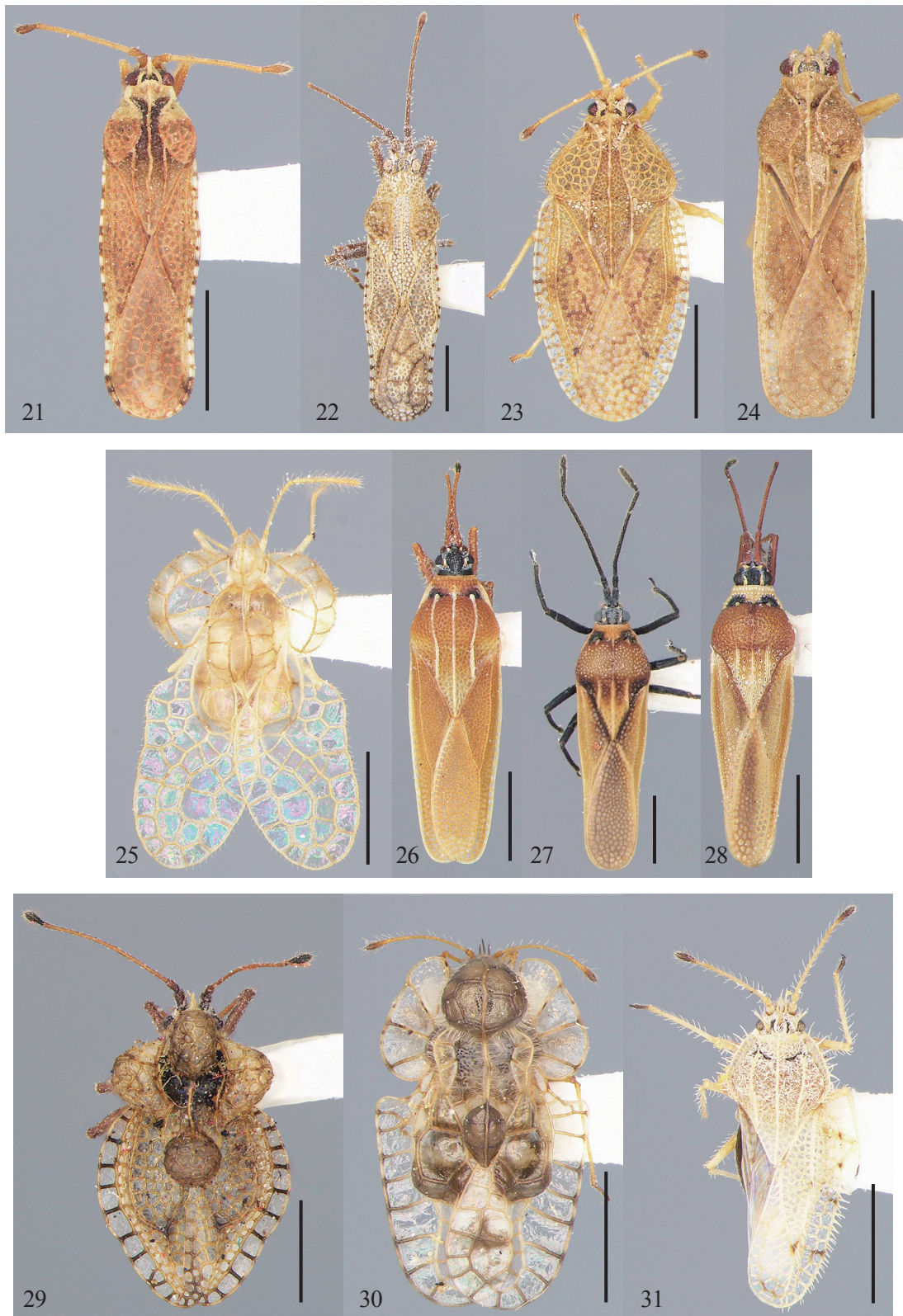
- (Heteroptera: Tingidae) from Turkey. *Türk. Bit. Kor. Derg.*, **1**(2): 23-27.
- Önder, F. & N. Lodos (1980) A short note about *Galeatus helianthi* Önder and Lodos (Heteroptera: Tingidae). *Türk. Bit. Kor. Derg.*, **4**(4): 231-232.
- Péricart, J. (1983) *Hémiptères Tingidae Euro-Méditerranéens. Faune de France 69*. Fédération Française des Sociétés de Sciences Naturelles. Paris, France: 618 pp.
- Péricart, J. & V. B. Golub (1996) Superfamily Tingoidea Laporte, 1832. In *Catalogue of the Heteroptera of the Palaearctic region. Vol. 2. Cimicomorpha I*. (Aukema, B. & C. Rieger, eds.). The Netherlands Entomological Society, Amsterdam, Netherland: 3-78.
- Rodstrom, R. A. & J. J. Brown (2017) Lace bugs : *Corythucha salicata* Gibson (Heteroptera: Tingidae). Washington State University Extension Publication FS274E. (online), available from <https://research.libraries.wsu.edu/xmlui/bitstream/handle/2376/12192/FS274E.pdf>, (accessed 2021-10-12).
- Sato, K. (1975) A list of bark beetles and pin-hole borers imported into Japan with timbers from abroad. *Res. Bull. Pl. Prot. Japan*, **12** (supplement): 2-67. [in Japanese]
- Schuh, R. T. & C. Weirauch (2020) *True bugs of the world (Hemiptera: Heteroptera) Classification and Natural History (Second Edition)*. Siri Scientific Press, Manchester, Britain: xxxii + 767 pp.
- Scudder, G. G. E. (2012) *Monosteira unicostata* (Mulsant & Rey) (Hemiptera: Tingidae) established in North America, with a key to the genera of Tingidae in Canada. *Entomol. Am.*, **118**(1): 295-297.
- Sugimoto, S., H. Kon & S. Kimura (2003) Additional list of aphids (Homoptera: Aphididae) intercepted at Japanese plant quarantine, II. *Res. Bull. Pl. Prot. Japan*, **39**: 79-84.
- Sugimoto, S. & K. Kitagawa (1991) Annotated list of the aphids (Homoptera: Aphidoidea) intercepted on import plant quarantine inspection. *Res. Bull. Pl. Prot. Japan*, **27**: 101-106. [in Japanese]
- Sugimoto, S. & K. Kitagawa (1994) Additional list of the aphids (Homoptera: Aphididae) intercepted on import plant quarantine inspection. *Res. Bull. Pl. Prot. Japan*, **30**: 127-129. [in Japanese]
- Sugimoto, S., M. Kadoi & E. Tasaka (1996) Miscellaneous notes on the scale insects (Homoptera: Coccoidea) intercepted at quarantine inspection on bananas. *Res. Bull. Pl. Prot. Japan*, **32**: 99-101. [in Japanese]
- Takahashi, G., Y. Yoshida, H. Kon & H. Kitamura (2003) Additional list of Lepidoptera intercepted at plant quarantine of Narita Airport in Japan, II. *Res. Bull. Pl. Prot. Japan*, **39**: 93-102. [in Japanese]
- Takeya, C. (1933) New or little-known lace bugs from Japan, Corea and Formosa (Hemiptera: Tingitidae). *Mushi*, **6**: 32-39.
- The Plant List (2013) Version 1.1. (online) (<http://www.theplantlist.org/>), (accessed 2022-03-15).
- Tomokuni, M. & T. Saito (1998) *Dulinius conchatus* Distant (Heteroptera, Tingidae), presumably a recent invader to Japan. *Rostria*, **47**: 23-28.
- Tokihiro, G. (1998) A list of Lepidopterous insects on imported plants at Narita Airport. *Res. Bull. Pl. Prot. Japan*, **34**: 81-88. [in Japanese]
- Tokihiro, G. (1999) A list of coleopterous and hemipterous insects intercepted on imported cut flowers and vegetables from Australia. *Res. Bull. Pl. Prot. Japan*, **35**: 151-155.
- Tokihiro, G. (2006) List of mealybugs (Homoptera: Pseudococcidae) intercepted at Japanese plant quarantine mainly from areas without a record of distribution. *Res. Bull. Pl. Prot. Japan*, **42**: 59-61. [in Japanese]
- Tokihiro, G., K. Tanaka & K. Kondo (2003) Occurrence of the sycamore lace bug, *Corythucha ciliata* (Say) (Heteroptera: Tingidae) in Japan. *Res. Bull. Pl. Prot. Japan*, **39**: 85-87.
- Ueda, I. (1990) Powder-post beetles intercepted on incoming plant material. *Res. Bull. Pl. Prot. Japan*, **26**: 105-111. [in Japanese]
- Yamada, K. & M. Tomokuni (2012) Family Tingidae Laporte, 1832 Lace bugs. In *A field guide to Japanese bugs. Terrestrial heteropterans. Vol. 3*. (Ishikawa, T., Takai, M. & T. Yasunaga, eds.). Zenkoku Noson Kyoiku Kyokai, Tokyo, Japan: 180-215, pls. 2-13. [in Japanese]
- Yoshitake, H., E. Colonnelli & M. Genka (2017) Ceutorhynchinae weevils (Coleoptera, Curculionidae) intercepted at the Narita Sub-station, Yokohama Plant Protection Station, Japan. *Elytra*, (new series), **7**(2): 499-516.
- Yoshitake, H., R. S. Anderson & M. Genka (2014) A list of New World weevils (Coleoptera: Curculionidae) intercepted at the Kobe Plant Protection Station, Japan. *Coleopt. Bull.*, **68**: 628-630.
- Zúbrik, M., A. Gubka, S. Rell, A. Kunca, J. Vakula, J. Galko, C. Nikolov & R. Leontovyč (2019) First record of *Corythucha arcuata* in Slovakia - Short Communication. *Plant Prot. Sci.*, **55**(2): 129-133.



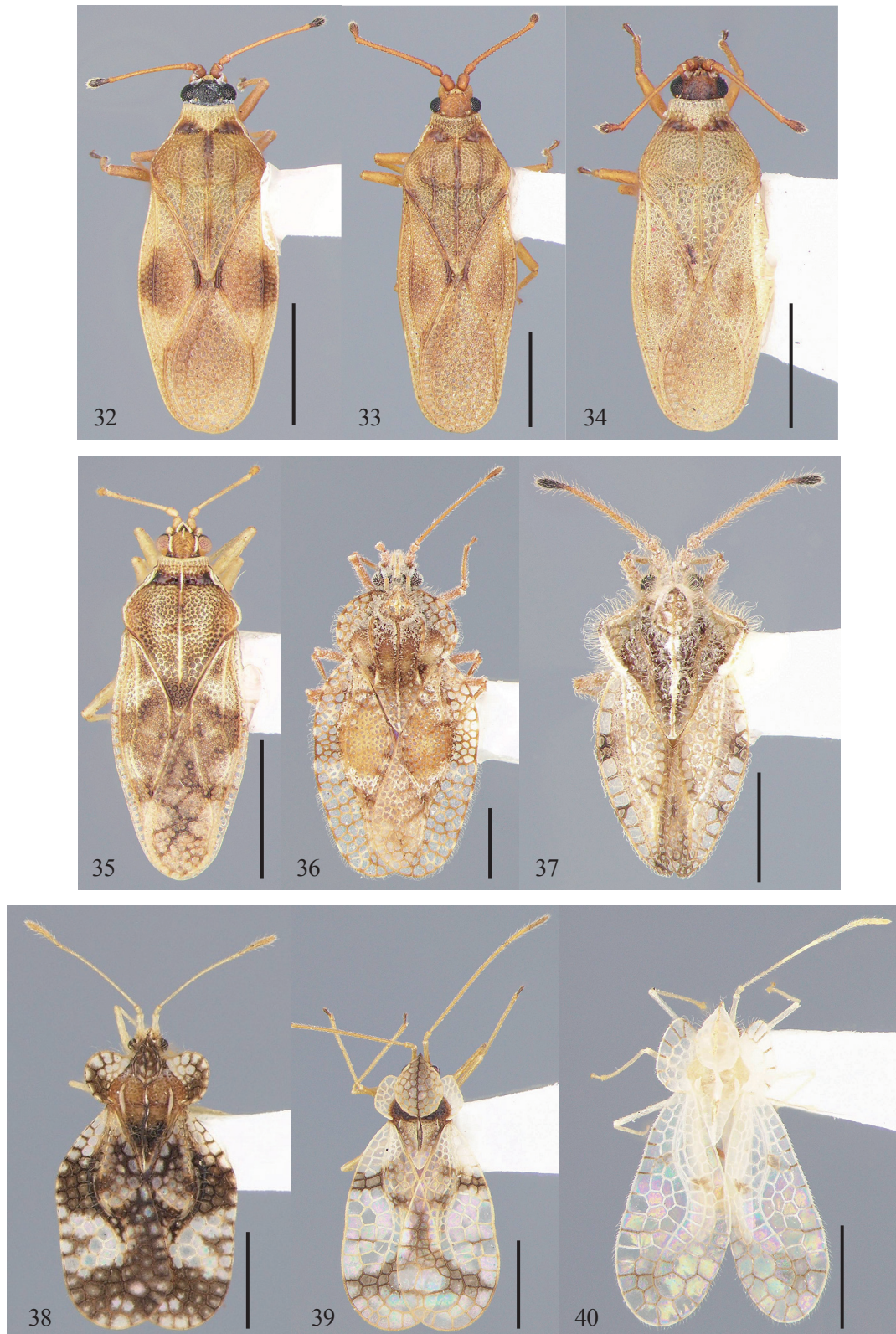
Figs. 1-10 Dorsal habitus of lace bugs intercepted at Narita International Airport. — 1: *Cantacader quinquecostatus* (Fieber); 2: *Cnemiandrus typicus* Distant; 3: *Phatnoma* sp. 1; 4: *Phatnoma* sp. 2; 5: *Sinalda* sp.; 6: Cantacaderinae gen. sp.; 7: *Agramma* sp. 1; 8: *Agramma* sp. 2; 9: *Atheas nigricornis* Champion; 10: *Beleus dentatus* (Fieber). Scale bars = 1.0mm.



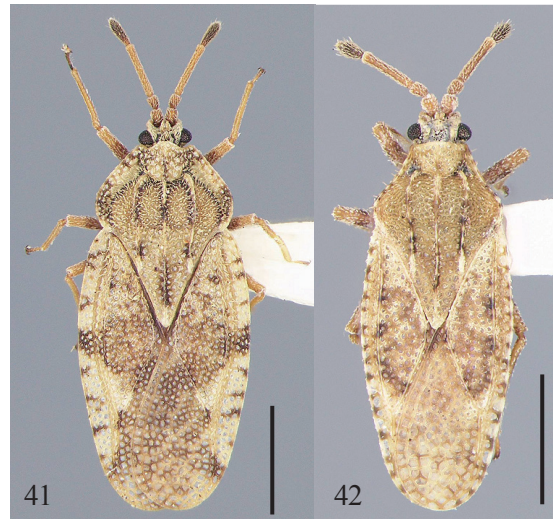
Figs. 11-20 Dorsal habitus of lace bugs intercepted at Narita International Airport. — 11: *Ceratinoderma fornicata* Stål; 12: *Chorotingis indigena* Drake; 13: *Cochlochila austroafricana* Rodrigues; 14: *Cochlochila bullita* (Stål); 15: *Cochlochila* sp.; 16: *Corythucha arcuata* (Say); 17: *Corythucha ciliata* (Say); 18: *Corythucha gossypii* (Fabricius); 19: *Corythucha marmorata* (Uhler); 20: *Corythucha salicata* Gibson. Scale bars = 1.0mm.



Figs. 21-31 Dorsal habitus of lace bugs intercepted at Narita International Airport. — 21: *Cysteochila endeca* Drake; 22: *Cysteochila* sp. 1; 23: *Cysteochila* sp. 2; 24: *Cysteochila* sp. 3; 25: *Dulinius conchatus* Distant; 26: *Epimixia dysmica* Drake & Ruhoff; 27: *Epimixia veteris* Drake; 28: *Epimixia vittata* Horváth; 29: *Euhanes inflatus* Distant; 30: *Galeatus scrophicus* Saudners; 31: *Inoma* sp. Scale bars = 1.0mm.



Figs. 32-40 Dorsal habitus of lace bugs intercepted at Narita International Airport. — 32: *Malandiola semota* Drake; 33: *Malandiola* sp. 1; 34: *Malandiola* sp. 2; 35: *Monosteira unicastata* (Mulsant & Rey); 36: *Pontanus accedens* (Drake); 37: *Sanazarius cuneatus* Distant; 38: *Stephanitis nashi* Esaki & Takeya; 39: *Stephanitis pyrioides* (Scott); 40: *Stephanitis typica* (Distant). Scale bars = 1.0mm.



Figs. 41-42 Dorsal habitus of lace bugs intercepted at Narita International Airport. — 41: *Tingis cardui* (Linnaeus); 42: *Tingis griseola* (Puton). Scale bars = 1.0mm.

Figs. 43-46 Dorsal habitus of live last-instar nymphs. — 43: *Phatnoma* sp. 1; 44: *Sinalda* sp.; 45: Cantacaderinae gen. sp.; 46: *Malandiola* sp. 1.

和 文 摘 要

成田空港における輸入植物検疫で発見されたゲンバイムシ科（カメムシ目）（英文）

能登 靖貴¹⁾

横浜植物防疫所成田支所

1997年から2020年の24年間に成田空港における輸入植物検疫で発見されたゲンバイムシ科の標本422点を調査した。調査標本は42種に類別され、種まで同定されたものは29種362点、属まで同定されたものは7属59点、亜科までの同定に留めたものは1点であった。本邦未発生であった34種のうち、*Cochlochila bullita*、*Corythucha arcuata*、*Corythucha gossypii*、*Cysteochila endeca*、*Galeatus scrophicus* 及び *Monosteira unicastata* の6種は、Heteroptera of Economic Importance (Neal &

Schaefer, 2000) 及び Crop Protection Compendium (CABI, 2020) において、経済的な被害をもたらす害虫として報告のある種に該当した。産地及び付着植物のデータとともに、全42種の目録を作成した。これらの標本写真を撮影し、被写体全体に焦点のあった多焦点合成処理を行った画像を図示した。また、飼育により成虫を得た4種については、幼虫の生体写真も併せて図示した。

¹⁾ 横浜植物防疫所東京支所