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Tokuda, Makoto
Laboratory of System Ecology, Faculty of Agriculture, Saga University

Matsuo, Kazunori
Entomological Laboratory, Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University

Yukawa, Junichi
Entomological Laboratory, Faculty of Agriculture, Kyushu University

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Insect Galls Found on Miyakejima and Hachijojima, the Izu Islands, Tokyo, Japan

Makoto Tokuda1), Kazunori Matsuo2) and Junichi Yukawa3)

1) Laboratory of System Ecology, Faculty of Agriculture, Saga University, Saga, 840-8502 Japan
2) Entomological Laboratory, Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University, Fukuoka, 812-8581 Japan
3) Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, 812-8581 Japan

Abstract. Cecidomyiid and other insect galls were surveyed from 2009 to 2011 on Miyakejima and Hachijojima, the Izu Islands, Tokyo, Japan. We found 18 and 21 sorts of cecidomyiid gall on Miyakejima and Hachijojima, respectively. Among them, leaf gall or necrosis on Machilus thunbergii (Lauraceae), leaf gall on Styrax japonica var. kotoensis (Styracaceae), and stem gall on Artemisia indica var. maximowiczii (Asteraceae) were newly discovered in this study. Stem gall induced on Castanopsis sieboldii (Fagaceae) was previously recorded only from Okinawa Island, but we revealed that it is distributed also on the Izu Islands. Furthermore, eight sorts of cecidomyiid gall were newly found from the Izu Islands, six sorts were from Miyakejima, and six sorts were from Hachijojima. As a supplementary result, two gall midge species newly found on Mikurajima Island were also reported in this study. Leaf gall induced by Trioza cinna-momi and Trioza nigra (Hemiptera: Psylloidea) was new to Miyakejima, and leaf gall induced by Liothrips kawanai (Thysanoptera: Phlaeothripidae) and stem gall induced by Ornataclides trifidus (Coleoptera: Curculionidae) were new to Hachijojima. Then petiole gall induced by Paratephritis fukaii (Diptera: Tephritidae) was recorded for the first time from Miyakejima and Hachijojima.

Key words: biogeography, Cecidomyiidae, gall midge, host plant, new distribution records.

Introduction

Many biologists have paid special attention to island biota, which exhibits differences in various aspects from that of mainland (e.g. MacArthur & Wilson, 1967; Thornton, 1996; Stuessy & Ono, 1998; Thornton et al., 2002). The Izu Islands consist of several volcanic islands located south of the Izu Peninsula, Honshu, Japan, extending for about 230 km from north to south. The Islands have a unique biota represented by insects (e.g. Kurosawa, 1978; Inoue & Amano, 1986; Takaoka & Saito, 2005), terrestrial reptiles (e.g. Hasegawa, 2003), and plants (e.g. Inoue, 1988; Oiki et al., 2001; Miyake & Inoue 2003).

Gall-inducing insects are suitable organisms for biogeographic studies, because galls are generally specific in shape and structure to gall inducers and remain on plants for a long period. Moreover, evidence indicating death or survival of gall inducers exists long after the event. These features enable us to identify gall inducers without dissection of galls, evaluate population density, compile the life table of inducers, and investigate the gall-inducer fauna of nominated localities within a short period of surveys (e.g. Partomihardjo et al., 2011; Tokuda et al., 2012).

Various organisms such as predators, parasitoids, inquilines, cecidophages, and successors are known to be associated with galls and gall inducers (Mani, 1964; Yukawa, 1983). Gall inducers can be regarded as keystone taxa of the terrestrial ecosystem, because they affect not only associated organisms but also other herbivores through the manipulation of host characteristics (e.g. Ohgushi, 2005).

Gall inducers generally have high host specificity and the induction of galls is essential for the survival of most of them. Therefore, the colonization of oceanic islands by
gall inducers is premised on the existence of their host plants. In addition, many gall inducers such as gall midges (Diptera: Cecidomyiidae) are known to have weak flight and dispersal abilities due to degenerated wing veins and very short adult life span (e.g. Gagné, 1989, 1994; Yukawa & Masuda, 1996; Yukawa & Rohfrisch, 2005). Thus, the dispersal of gall midges depends primarily on the power of wind (Yukawa & Partomihardjo, 1997; Partomihardjo et al., 2011).

As has been summarized by Tokuda et al. (2012), some researchers recorded gall midges occurring on the Izu Islands (Ishizawa, 1942; Yukawa, 1971, Sunose, 1981, Hachijojima Interpretation Association, 2007). Most recently Tokuda et al. (2012) reported gall midge faunas of Mikurajima and Aogashima Islands. Prior to the comprehensive biogeographic study of gall-inducers in the mainland (Honshu, Japan) and the Izu Islands, this paper intends to accumulate the faunal information on gall-inducing insects on Hachijojima (Hachijo, hereafter) and Miyakejima (Miyake) Islands, the Izu Islands, Tokyo, Japan. As supplementary records, gall midges newly found on Mikurajima Island (Mikura) were also included in this paper.

Methods

Galls induced by cecidomyiids and other gall inducers were surveyed on Miyake (10-12 Apr. & 6-7 May 2009 by MT; 5-6 Apr. 2010 by MT & KM; 16 Nov. 2011 by MT), Mikura (16-17 Nov. 2011 by MT, as a supplementary survey to Tokuda et al., 2012), and Hachijo (8-9 Apr. & 8-9 May 2009 by MT; 8-10 Apr. 2010 by MT & KM; 6-7 Apr. 2011 by MT & KM; 20-23 Sept. 2011 by MT & KM; 17-18 Nov. 2011 by MT). Detailed methods of field survey and collecting galls are fundamentally the same as those described in Tokuda et al. (2012).

Each collecting record of gall consists of latitude, longitude, altitude, and collecting date. Galls induced by cecidomyiids are first listed according to the order in Yukawa & Masuda (1996) and then followed by those induced by other insects. Gall numbers designated by Yukawa & Masuda (1996) are shown in brackets for respective galls. Corresponding reference is cited in the case when the taxonomic status of gall inducer was newly proposed after Yukawa & Masuda (1996). Absence records of gall are also included in the results.

The family name of host plants follows the Angiosperm Phylogeny Group (APG) system of plant classification (Stevens, 2008). Plant and insect specimens collected during the course of this study are kept in the Laboratory of System Ecology, Faculty of Agriculture, Saga University, Japan or in the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Japan.

Results

Galls induced by cecidomyiids

FAGACEAE

Stem gall induced by an unidentified cecidomyiid on Castanopsis sieboldii (Makino) Hatus. ex T. Yamaz. et Mashiba [C-163] (New distribution record from Tokyo) (Fig.1)

Japanese name: ‘Sudajii-eda-donguri-fushi’

[Miyake] N34°06′ E139°31′, Alt. 314 m, 16 Nov. 2011; N34°03′ E139°32′, Alt. 10-84 m, 16 Nov. 2011; N34°03′ E139°31′, Alt. 20 m, 16 Nov. 2011; N34°05′ E139°29′, Alt. 41 m, 16 Nov. 2011; N34°06′ E139°30′, Alt. 357 m, 16 Nov. 2011; N34°06′ E139°33′, Alt. 3 m, 16 Nov. 2011.

[Mikura] N33°54′ E139°36′, Alt. 106-233 m, 16-17 Nov. 2011; N33°53′ E139°37′, Alt. 368 m, 17 Nov. 2011.

[Hachijo] N33°07′ E139°47′, Alt. 16 m, 21 Sept. 2011; N33°06′ E139°48′, Alt. 68-301 m, 23 Sept. & 17 Nov. 2011; N33°07′ E139°49′, Alt. 108 m, 18 Nov. 2011; N33°05′ E139°48′, Alt. 270 m, 18 Nov. 2011; N33°04′ E139°49′, Alt. 198 m, 18 Nov. 2011; N33°04′ E139°50′, Alt. 271 m, 18 Nov. 2011; N33°06′ E139°51′, Alt. 225-282 m, 18 Nov. 2011.

Remarks: This gall was previously reported only from Okinawa Island (Yamauchi et al., 1982). Detailed life history of the gall midge is still unknown.

AMARANTHACEAE

Stem gall induced by Lasioptera achyranthii Shinji on Achyranthes bidentata var. japonica Miq. [C-245] (New distribution record from the Izu Islands)

Japanese name: ‘Inokozuchi-kuki-maruzui-fushi’

[Miyake] N34°03′ E139°31′, Alt. 10-84 m, 16 Nov. 2011; N34°05′ E139°31′, Alt. 3 m, 16 Nov. 2011; N34°06′ E139°33′, Alt. 108 m, 16 Nov. 2011; N34°06′ E139°34′, Alt. 357 m, 16 Nov. 2011; N34°06′ E139°35′, Alt. 3 m, 16 Nov. 2011.

[Mikura] N33°54′ E139°36′, Alt. 106-233 m, 16-17 Nov. 2011; N33°53′ E139°37′, Alt. 368 m, 17 Nov. 2011.

[Hachijo] N33°07′ E139°47′, Alt. 16 m, 21 Sept. 2011; N33°06′ E139°48′, Alt. 68-301 m, 23 Sept. & 17 Nov. 2011; N33°07′ E139°49′, Alt. 108 m, 18 Nov. 2011; N33°05′ E139°48′, Alt. 270 m, 18 Nov. 2011; N33°04′ E139°49′, Alt. 198 m, 18 Nov. 2011; N33°04′ E139°50′, Alt. 271 m, 18 Nov. 2011; N33°06′ E139°51′, Alt. 225-282 m, 18 Nov. 2011.

Remarks: This gall was previously reported only from Okinawa Island (Yamauchi et al., 1982). Detailed life history of the gall midge is still unknown.

LAURACEAE

Leaf gall induced by Pseudasphondylia neolitseae Yukawa on Neolitsea sericea (Blume) Koidz. [C-254] (New distribution record from the Izu Islands)

Japanese name: ‘Shirodamo-ha-kobu-fushi’


[Hachijo] N33°05′ E139°47′, Alt. 86 m, 21 Sept. 2011; N33°06′ E139°48′, Alt. 198 m, 22 Sept. 2011; N33°09′ E139°45′, Alt. 59 m, 22 Sept. 2011.
Barrel-shaped leaf gall induced by *Daphnephila machilicola* Yukawa on *Machilus thunbergii* Sieb. et Zucc. [C-256]  
**Japanese name:** ‘Tabunoki-haura-usu-fushi’  
**[Miyake]** N34°06′ E139°30′, Alt. 357 m, 11 Apr. 2009; N34°06′ E139°31′, Alt. 318 m, 11 Apr. 2009; N34°07′ E139°33′, Alt. 29-66 m, 11 Apr. 2009; N34°03′ E139°29′, Alt. 40 m, 5 Apr. 2010; N34°04′ E139°33′, Alt. 77 m, 6 Apr. 2010; N34°04′ E139°32′, Alt. 319 m, 6 Apr. 2010.  
**[Hachijo]** N 33°06′ E 139°48′, Alt. 307 m, 8 Apr. 2009; N 33°05′ E 139°49′, Alt. 499-563 m, 8 Apr. 2009; N33°06′ E139°50′, Alt. 330-478 m, 9 Apr. 2009 & 9 Apr. 2010; N33°06′ E139°50′, Alt. 179 m, 6 May 2009; N33°05′ E139°47′, Alt. 235 m, 8 Apr. 2010; N33°07′ E139°47′, Alt. 16-90 m, 6 Apr. & 21 Sept. 2011; N33°09′ E139°45′, Alt. 59 m, 7 Apr. 2011; N33°06′ E139°47′, Alt. 86 m, 21 Sept. 2011; N33°07′ E139°46′, Alt. 27 m, 22 Sept. 2011.

Stem gall induced by an unidentified cecidomyiid on *M. thunbergii* [C-259]  
**Japanese name:** ‘Tabunoki-eda-zui-fushi’  
**[Miyake]** N 33°05′ E 139°49′, Alt. 499-563 m, 8 Apr. 2009; N 33°05′ E 139°49′, Alt. 499-563 m, 8 Apr. 2009; N33°07′ E139°47′, Alt. 35-211 m, 11 Apr. 2009 & 6 Apr. 2010; N33°06′ E139°32′, Alt. 245 m, 6 Apr. 2010 (old galls); N33°04′ E139°47′, Alt. 179 m, 6 Apr. 2010 (old galls); N33°06′ E139°47′, Alt. 86 m, 21 Sept. 2011; N33°07′ E139°46′, Alt. 27 m, 22 Sept. 2011.  
**[Hachijo]** N33°06′ E139°49′, Alt. 666 m, 8 Apr. 2009 (old galls); N33°07′ E139°49′, Alt. 33 m, 9 Apr. 2009 (old galls).

Leaf gall or necrosis induced by an unidentified cecidomyiid on *M. thunbergii* (New finding) (Figs. 2-3)  
**[Miyake]** N34°03′ E139°31′, Alt. 20 m, 6 Apr. 2010.  
**Remarks.** The gall midge larvae were found in the inter-leaf spaces of host buds that were about to open. Leaf parts injured by the larvae blackened in April (Fig. 2), probably by the necrosis of host tissue surrounding the larvae. The injured parts turned into grayish brown spots in mature leaves (MT, Nov. 2011, personal observation of leaves marked in April 2010; Fig. 3). The spots were somewhat similar in color to the gall scars of C-262 in Yukawa and Masuda (1996),
but the shape was not round but rather amorphous, and larger than the latter. The detailed life history of gall midge is unknown. Although we tentatively included the symptom in this list, further histological studies are needed to determine whether the leaf parts injured by the gall midge are galls or simple necrosis.

THEACEAE
Leaf-vein gall induced by *Lasioptera cameriae* Ohno & Yukawa on *Camellia japonica* L. [C-280]

**Japanese name:** ‘Yabutsubaki-hamyaku-fukure-fushi’

[Miyake] N34°03′ E139°33′, Alt. 88 m, 12 Apr. 2009; N34°07′ E139°33′, Alt. 57 m, 6 Apr. 2010.

FABACEAE
Leaf gall induced by *Pitydiplosis puerariae* Yukawa, Ikenaga & Sato on *Pueraria lobata* (Willdenow) Ohwi [C-339] (New distribution record from the Izu Islands)

**Japanese name:** ‘Kuzu-ha-togaritama-fushi’

Reference: Yukawa et al. (2012).

[Mikura] N33°54′ E139°36′, Alt. 125 m, 17 Nov. 2011.

AQUIFOLIACEAE
Bud gall induced by *Asteralobia sasakii* (Monzen) on *Ilex crenata* var. *hachijoensis* Nakai [C-373]

**Japanese name:** ‘Hachijjonutsuge-me-tama-fushi’

Reference: Tokuda et al. (2004a).

[Miyake] N34°05′ E139°30′, Alt. 369 m, 5 Apr. 2010; N34°06′ E139°30′, Alt. 357 m, 5 Apr. 2010; N34°05′ E139°31′, Alt. 272 m, 5 Apr. 2010; N34°06′ E139°30′, Alt. 357 m, 5 Apr. 2010; N34°07′ E139°30′, Alt. 300 m, 5 Apr. 2010; N34°05′ E139°30′, Alt. 300 m, 5 Apr. 2010.

[Hachijo] N33°06′ E139°48′, Alt. 200 m, 7 Apr. 2011; N33°07′ E139°52′, Alt. 156 m, 6 Apr. 2011.

Bud gall induced by *Asteralobia soyogo* (Kikuti) on *Ilex integra* Thunb. [C-375] (New distribution record from Hachijo)

**Japanese name:** ‘Mochinoki-me-tama-fushi’

Reference: Tokuda et al. (2004a).

[Hachijo] N33°09′ E139°51′, Alt. 212 m, 7 May 2009; N33°05′ E139°51′, Alt. 272 m, 5 Apr. 2010; N33°06′ E139°50′, Alt. 16 m, 5 Apr. 2010.

VITACEAE
Fruit gall induced by *Asphondylia baca* Monzen on *Ampelopsis glandulosa* (Wall.) Momiy. var. *heterophylla* (Thunb.) Momiy. [C-386]

**Japanese name:** ‘Nobudou-mi-fukure-fushi’

[Hachijo] N33°07′ E139°49′, Alt. 33-211 m, 20 Sept 2011; N33°06′ E139°48′, Alt. 100-315 m, 23 Sept 2011.

ELAEAGNACEAE
Leaf gall induced by an unidentified cecidomyiid on *Elaeagnus umbellata* Thunb. (New distribution record from the Izu Islands)

**Japanese name:** ‘Aki-gumi-ha-kobu-fushi’


[Miyake] N34°03′ E139°29′, Alt. 36 m, 5 Apr. 2010.

ARALIACEAE
Fruit gall induced by *Asphondylia sp.* on *Hedera rhombea* (Miq.) Bean [C-417] (New distribution record from the Izu Islands)

**Japanese name:** ‘Kizuta-mi-fukure-fushi’

Reference: Tokuda et al. (2004b).

[Hachijo] N33°06′ E139°47′, Alt. 100-315 m, 7 Apr. 2010; N33°07′ E139°52′, Alt. 80 m, 7 Apr. 2011.

STYRACACEAE
Ovate leaf gall induced by *Oxycephalomyia styraci* (Shinji) on *Styrax japonica* Sieb. et Zucc. var. *kotoensis* (Hayata) Masam. et T. Suzuki [D-015] (New distribution records from Miyake and Hachijo)

**Japanese name:** ‘Ohbaegonoki-ha-tsubo-fushi’

Reference: Tokuda et al. (2004b).

[Miyake] N34°06′ E139°33′, Alt. 381-315 m, 7 Apr. 2010; N33°06′ E139°49′, Alt. 312 m, 7 Apr. 2011; N33°07′ E139°48′, Alt. 100-315 m, 7 Apr. 2011.

Leaf gall induced by an unidentified cecidomyiid on *S. japonica* var. *kotoensis* (New gall) (Figs. 4-5)
Japanese name: ‘Ohbaegonoki-haura-midoritama-fushi’ (new name)

[Miyake] N33°04′ E139°29′, Alt. 118 m, 10 Apr. 2009; N34°05′ E139°29′, Alt. 136 m, 9 May 2009; N34°06′ E139°31′, Alt. 317 m, 5 Apr. 2010.

Remarks: The gall is similar to D-016 in Yukawa and Masuda (1996), but the shape is more globular than D-016.

OLEACEAE
Fruit gall induced Asphondylia sphaera Monzen on L. ovalifolium Hassk. var. pacificum (Nakai) M. Mizush.

Japanese name: ‘Hachijoibota-mi-midori-fushi’

[Hachijo] N33°06′ E139°48′, Alt. 315 m, 23 Sept. 2011.

APOCYNACEAE
Root gall induced by Ametrodiplosis sp. on Trachelospermum asiaticum (Sieb. et Zucc.) Nakai

Japanese name: ‘Teikakazura-ne-kobu-fushi’

[Hachijo] N33°06′ E139°48′, Alt. 364 m, 8 Apr. 2010; N33°09′ E139°45′, Alt. 59 m, 9 Apr. 2010; N33°06′ E139°47′, Alt. 37 m, 10 Apr. 2010.

RUBIACEAE
Flower bud gall induced by Asphondyliini gen. sp. on Paederia scandens (Lour.) Merr.

Japanese name: ‘Hekusokazura-tsubomi-maru-fushi’

[Hachijo] N33°06′ E139°47′, Alt. 26 m, 9 Apr. 2010.

ASTRACEAE
Leaf gall induced by Rhopalomyia chrysanthemum Monzen on C. pacificum Nakai [D-075]

Japanese name: ‘Isogiku-ha-ibo-fushi’

Reference: Tokuda et al. (2012).

[Miyake] N34°07′ E139°33′, Alt. 21 m, 8 May 2009; N34°06′ E139°29′, Alt. 12 m, 9 May 2009 & 5 Apr. 2010.

[Hachijo] N33°04′ E139°50′, Alt. 18 m, 6 May 2009 & 9 Apr. 2010; N33°07′ E139°49′, Alt. 9-84 m, 7 May 2009 & 10 Apr. 2010; N33°06′ E139°46′, Alt. 26 m, 9 Apr. 2010.

Leaf gall induced by Rhopalomyia sp. on C. pacificum [D-087] (New distribution record from Miyake)

Japanese name: ‘Isogiku-me-nagatsubo-fushi’

Reference: Tokuda et al. (2012).

[Miyake] N34°05′ E139°29′, Alt. 32 m, 5 Apr. 2010.

Stem gall induced by Rhopalomyia sp. on Artemisia indica var. maximowiczii [New gall] (Fig. 6)

Japanese name: ‘Yomogi-negiwakuki-kobu-fushi’ (new name)

[Miyake] N34°05′ E139°29′, Alt. 32 m, 8 May 2009.

[Hachijo] N33°07′ E139°45′, Alt. 84 m, 7 May 2009.

Remarks: This gall is similar in shape to D-102 in Yukawa and Masuda (1996), but it is multi-chambered and induced only on the basal part of stem (= situated very close to the ground). The gall does not dehisce when gall midge adults emerge from it.

Leaf gall induced by Rhopalomyia cinerarius Monzen on A. indica var. maximowiczii [D-113] (New distribution record from the Izu Islands)

Japanese name: ‘Yomogi-ha-shiroketama-fushi’

[Miyake] N34°05′ E139°29′, Alt. 32 m, 8 May 2009.

[Hachijo] N33°07′ E139°49′, Alt. 49 m, 20 Sept 2011; N33°06′ E139°48′, Alt. 68 m, 21 Sept 2011; N33°05′ E139°47′, Alt. 198 m, 22 Sept 2011.
POACEAE
Seed gall induced by an unidentified cecidomyiid on *Setaria glauca* (L.) P. Beauv. (New distribution record from the Izu Islands)

Japanese name: ‘Kin-enokoro-mi-fukure-fushi’

[Hachijo] N33°09′ E139°45′, Alt. 59 m, 22 Sept. 2011.

Galls induced by insects other than Cecidomyiidae

Stem gall induced by *Merus piceus* (Roelofs) (Coleoptera: Curculionidae) on *C. sieboldii* [C-105]

Japanese name: ‘Sudajii-wakaeda-maruzui-fushi’

[Hachijo] N33°07′ E139°49′, Alt. 78 m, 20 Sept. 2011; N33°06′ E139°48′, Alt. 315 m, 23 Sept. 2011.

Leaf-vein gall induced by *Trioza cinnamomi* (Boselli) (Hemiptera: Psylloidea) on *Cinnamomum tenuifolium* (Makino) Sugim. ex. H. Hara (Lauraceae) [C-263] (New distribution record from Miyake)

Japanese name: ‘Yabunikkei-hamyaku-ibo-fushi’

[Miyake] N34°06′ E139°30′, Alt. 359 m, 11 Apr. 2009; N34°06′ E139°31′, Alt. 333 m, 11 Apr. 2009; N34°07′ E139°33′, Alt. 38 m, 11 Apr. 2009; N34°03′ E139°29′, Alt. 40 m, 12 Apr. 2009; N34°03′ E139°31′, Alt. 22 m, 12 Apr. 2009; N34°01′ E139°33′, Alt. 33 m, 12 Apr. 2009.

[Haychi] N33°05′ E139°47′, Alt. 128 m, 8 Apr. 2009; N33°07′ E139°49′, Alt. 32-211 m, 9 Apr. 2011; N33°06′ E139°49′, Alt. 424 m, 9 Apr. 2009; N33°05′ E139°51′, Alt. 71 m, 6 May 2009; N33°06′ E139°48′, Alt. 315-364 m, 8 Apr. 2010 & 23 Sept. 2011; N33°06′ E139°47′, Alt. 86 m, 21 Sept 2011; N33°07′ E139°46′, Alt. 27 m, 22 Sept. 2011.

Leaf gall induced by *Liothrips kuwanai* (Moulton) (Thysanoptera: Phlaeothripidae) on *Piper kadsura* (Choisy) Ohwi (Piperaceae) [C-269] (New distribution record from Hachijo)

Japanese name: ‘Fuhtoukazura-ha-chijimi-fushi’

[Miyake] N34°04′ E139°29′, Alt. 153 m, 10 Apr. 2009; N34°06′ E139°30′, Alt. 359 m, 11 Apr. 2009; N34°06′ E139°31′, Alt. 333 m, 11 Apr. 2009; N34°07′ E139°33′, Alt. 38 m, 11 Apr. 2009; N34°03′ E139°29′, Alt. 40 m, 12 Apr. 2009; N34°03′ E139°31′, Alt. 22 m, 12 Apr. 2009; N34°01′ E139°33′, Alt. 33 m, 12 Apr. 2009.

[Haychi] N33°05′ E139°47′, Alt. 128 m, 8 Apr. 2009; N33°07′ E139°49′, Alt. 33-211 m, 9 Apr. 2009 & 20 Sept. 2011; N33°06′ E139°49′, Alt. 424 m, 9 Apr. 2009; N33°05′ E139°51′, Alt. 71 m, 6 May 2009; N33°06′ E139°48′, Alt. 315-364 m, 8 Apr. 2010 & 23 Sept. 2011; N33°06′ E139°47′, Alt. 86 m, 21 Sept 2011; N33°07′ E139°46′, Alt. 27 m, 22 Sept. 2011.

Absence records of gall inducers

On Miyake, we surveyed several individuals of *Euonymus japonicus* Thunb. (Celastraceae), *H. rhombea*, and *Alpinia intermedia* Gagnep. (Zingiberaceae), but galls were not found.

On Hachijo, we surveyed about 50 trees of *Camellia japonica*, 50 trees of *E. japonicus*, 75 trees of *Elaeocarpus sylvestris* (Lour.) Poir. var. *ellipticus* (Thunb.) H. Hara (Elaeocarpaceae), and 50 plants of *A. intermedia*, but galls were not found.

The bud gall on *C. pacificum* [D-087] was found on Miyake (present study) and Mikura (Tokuda *et al.*, 2012), while not on Hachijo in spite of the intensive survey of about 20 communities (at least 2,000 individuals) during...
the course of the field surveys from 2009 to 2011. In addition, we searched for galls induced by Quadrastriochus erythrinae Kim (Hymenoptera: Eulophidae) on about 20 trees of Erythrina cristaga galli L. (Fabaceae) and those induced by Asteralobia patriniae (Shinji) (Diptera: Cecidomyiidae) on 60 individuals of Patrinia villosa (Thunb.) Duff. (Valerianaceae) on Hachijo in September 2011, but we did not find these galls.

**Discussion**

Through the field surveys from 2009 to 2011, 18 and 21 sorts of cecidomyiid gall were found on Miyake and Hachijo, respectively. In addition, stem gall on C. sieboldii (Fig. 1) and leaf gall on P. lobata were newly recorded from Mikura. Leaf gall or necrosis on M. thunbergii (Figs 2 and 3), leaf gall on S. japonica var. kotoensis (Figs. 4-5), and stem gall on A. indica var. maximoviczii (Fig. 6) were newly discovered in this study. Stem gall induced on C. sieboldii (Fig. 1) was previously recorded only from Okinawa Island (Yamauchi et al., 1982), but we revealed that it is distributed also on the three islands surveyed in this study. Furthermore, eight sorts of cecidomyiid gall were newly found from the Izu Islands, six sorts were from Miyake, and six sorts were from Hachijo.

As a result of our field survey on southern parts of the Izu Islands (from Miyake to Aogashima), galls recorded from Miyake, Mikura, Hachijo, and Aogashima became 18, 16, 23, and 3 sorts, respectively. Among the 23 sorts on Hachijo, fruit gall on A. glandulosa and bud gall on W. coraeensis var. fragrans are induced by the same gall midge species, A. baca, as a result of host alternation (Uechi et al., 2004). Therefore, the numbers of gall-inducing cecidomyiids recorded are 18, 16, 22, and 3 species on Miyake, Mikura, Hachijo, and Aogashima, respectively.

*L. camelliae* was previously recorded from Izu-Ohshima, the northern most island of the Izu Islands, to Mikura, but not from Hachijo (Sunose, 1981; Tokuda et al., 2012). Through our field survey, we also did not find *L. camelliae* on Hachijo, suggesting that the gall midge has never colonized Hachijo or its population density was extremely low on this island.

*T. cinnamoni* was previously known to occur on Hachijo, Mikura, and Aogashima (Miyatake, 1966, Tokuda et al., 2012), and was reported for the first time from Miyake in this study.

**References**


Ishizawa, J., 1942. [Insects in the Four Seasons.] Ars, Tokyo. (In Japanese.)


