

Midge Galls of Hokkaido

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Received for Publication August 29, 1978

Introduction

At least 215 sorts of midge gall on about 200 plant species have been known to occur in Japan^{4-6,17,20-22}). A large majority of those has been collected mainly from Honshu, Shikoku and Kyushu, and at most 8 of them from Hokkaido^{1-3,18,24}). In recent years the authors had some opportunities to examine many midge galls collected from various parts of Hokkaido. The present paper is intended to list the midge galls of Hokkaido together with the collecting data, and to describe new midge galls recorded, for the first time, from Japan. In addition, the present paper refers to new host-plant-records of gall midges, and to the midge galls previously described but newly recorded from Hokkaido during the course of this study. As a result, a total of 51 sorts of midge gall is recognized to be distributed in Hokkaido.

Materials and Methods

The midge galls listed in the present paper, except four previously described galls, were collected from various parts of Hokkaido through occasional field investigations during the period between 1974 and 1978. Some of the collected galls were measured by slide calipers, and dissected to confirm whether they were caused by gall midges. The number of larvae and larval chambers per gall was counted and the developmental stages were also examined. The rest of the galls were retained in the laboratory to rear adult midges. The collection of gall midge and the midge gall specimens examined here are kept in the Entomological Laboratory of Kagoshima University.

In listing gall-bearing plants and describing entries for each gall, the authors adopt a method similar to the one used in the check list of midge galls of Japan^{20,21}).

Pinaceae

Abies sachalinensis Fr. Schm. "Aka-todomatsu"

Needle, "Ha-tama-fushi"^{1,19,21,23}). *Paradiplosis manii* (Inouye).

To examine the gall from Hokkaido was not possible for the authors.

Picea jezoensis Carr. "Ezo-matsu"

Bud, twig, "Me-fushi"^{2,18,19,21}). *Dasineura ezomatsue* Uchida & Inouye.

To examine the gall from Hokkaido was not possible for the authors.

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Taxodiaceae

Cryptomeria japonica D. Don "Sugi"

Needle, "Ha-tama-fushi"^{2,19,21}. *Contarinia inouyei* Mani.

To examine the gall from Hokkaido was not possible for the authors.

Salicaceae

Salix holtenii Floderus var. *angustifolia* Kimura "Ezo-no-bakko-yanagi"

Leaf, "Ha-hime-kobufushi"^{6,20}. Midge not identified, but may be identical with *Iteomyia capreae* (Winnertz). new host rec. & new rec. from Hokkaido, Moiwayama, Sapporo, 24.X.1974, T. Sunose leg.; Shikotsu-kohan, Iburi, 4.IX.1977, J. Yukawa & S. Yamauchi leg.; Toyotaki, Sapporo, 5.IX.1977, T. Sunose leg.

Salix sp.

Stem, "Eda-kobu-fushi"^{4,10,14,17,19,20}. *Rhabdophaga salicis* (Schrank) (= *Rhabdophaga saliyonai* Shinji). new rec. from Hokkaido. Hakodateyama, Hakodate, 12.VI.1975, T. Sunose leg.; Shikotsu-kohan, Iburi, 15.V.1976, T. Sunose leg.; Asari, Otaru, 22.V. 1977, T. Sunose leg.

Betulaceae

Betula platyphylla Sukatchev. var. *japonica* Hara "Shira-kanba"

Female catkin, "Mi-fushi" new name. According to Roskam¹², three species of gall midge, *Semudobia betulae* (Winnertz), *Semudobia skuhravae* Roskam and *Semudobia tarda* Roskam are associated with the Japanese *Betula* species. Hokkaido Univ. campus, Sapporo, 9.I.1976, T. Sunose leg.

Fagaceae

Quercus mongolica Fisch. var. *grosseserrata* Rehd. et Wils. "Mizu-nara"

Leaf, "Haberi-ore" **new gall rec.** Adult unknown. A part of leaf margin folded downward. This gall is similar to that on *Quercus serrata* Thunb.^{6,20}, but is distinguished from it by the fact that in this gall the leaf margin is folded not upward but downward. Usuzan, Tôya-mura, Iburi, 8.VI.1978, T. Kumata leg. (Fig. A).

Ulmaceae

Ulmus davidiana Planch. var. *japonica* (Rehd.) Nakai "Haru-nire"

Leaf, "Haore" **new gall rec.** Adult unknown. Leaf blade folded along side vein; two or more white larvae inhabiting underside of the folded portion. Usuzan, Tôya-mura, Iburi, 8.VI.1978, T. Kumata leg. (Fig. B).

Leaf, "Hime-tsubo-fushi" **new gall rec.** Adult unknown. Relatively small, slender barrel-shaped swelling mainly on underside of the leaf; surface smooth, green; an elongated cylindrical larval chamber situated in the centre, usually containing one midge larva; height about 3.5 mm, diameter about 1.0 mm. Teshikaga, Kushiro, 23.IX.1977, T. Sunose leg.; Hokkaido Univ. campus, Sapporo, 29.IX.1977, T. Sunose

leg. (Fig. C).

Moraceae

Morus alba L. "Kuwa"

Leaf, petiole, "Eboshi-fushi"^{3,11,19,20}. ? *Diplosis morivorella* Naito (? = *Diplosis moricola* Matsumura). Tôya-kohan, Iburi, 7.VI.1975, T. Sunose leg.; Asari, Otaru, 10.VI.1978, T. Sunose leg.

Leaf, "Kobu-fushi"^{6,20}. Adult unknown. Ikeda, Tokachi, 22.IX.1977, T. Sunose leg.

Urticaceae

Boehmeria spicata (Thunb.) Thunb. "Akaso"

Fruit, "Mi-fushi" **new gall rec.** Adult unknown. Each fruit somewhat elongated, forming a globular cluster of fruits which is 10 to 16 mm in diameter and is larger than normal cluster of fruits; an ellipsoidal larval cavity situated in the centre; normally one midge larva inhabiting each cavity. Kôshunai, Bibai, 2.IX.1977, J. Yukawa leg.; Toyotaki, Sapporo, 5.IX.1977, T. Sunose leg.; Asari, Otaru, 7.X.1977, T. Sunose leg. (Fig. D).

Laportea bulbifera (Sieb. et Zucc.) Weddell "Mukago-irakusa"

Leaf, "Ha-kobu-fushi" **new gall rec.** Adult unknown. Spheroidal swelling on upper and lower surfaces; diameter about 4.0 mm, thickness about 3.5 mm; one midge larva inhabiting each gall; mature larva escaping from dehiscent lower portion of the gall. Moiwayama, Sapporo, 9.VII.1974, T. Sunose leg.; Jôzankei, Sapporo, 10.X.1975, K. Yamagishi leg.; Shiranuka, Kushiro, 22.IX.1977, T. Sunose leg. (Fig. E).

Urtica platyphylla Weddell "Ezo-irakusa"

Leaf, petiole, stem, "Haguki-fushi" **new gall rec.** Adult unknown.

Irregular, fleshy swelling on the leaf, petiole and stem; frequently many galls arising continuously; usually one midge larva inhabiting each larval chamber. Asari, Otaru, 7.X.1977, T. Sunose leg. (Fig. F).

Polygonaceae

Polygonum filiforme Thunb. "Mizuhiki"

Stem, "Zui-fushi"^{17,20}. Adult unknown. new rec. from Hokkaido.

Moiwayama, Sapporo, 11.X.1975, K. Yamagishi leg.; Takaoka, Tomakomai, 5.IX.1977, J. Yukawa & S. Yamauchi leg.

Polygonum sachalinensis Fr. Schmidt "Ôitadori"

Leaf, "Ha-maki" **new gall rec.** Adult unknown. Leaf margin rolled downward; many larvae inhabiting the roll. Shikotsu-kohan, Iburi, 4.IX.1977, S. Yamauchi & J. Yukawa leg. (Fig. G).

Saxifragaceae

Hydrangea paniculata Sieb. "Nori-utsugi"

Fruit, "Mi-fushi"^{4,15-17,19,20}. *Sylvestrina hydrangeae* (Shinji). new rec. from Hokkaido.

Toyotomi, Sôya, 1.IX.1975, T. Sunose leg.; Kabuka, Rebun I., Sôya, 4.IX.1975, T. Sunose leg.; Takaoka, Tomakomai, 4-5.IX.1977, S. Yamauchi & J. Yukawa leg.; Usuzan, Tôya-mura, Iburi, 10.IX.1977, T. Kumata leg.

Rosaceae

Filipendula purpurea Maxim. "Kyôganoko" (= "Ezo-no-shimotsukesô")

Leaf, "Hoso-tsubo-fushi" **new gall rec.** Adult unknown. Pear-shaped or club-shaped swelling, apically provided with a conical elevation; usually hypophyllous; surface smooth, green; an elongated cylindrical larval cavity situated in the centre; only one midge larva inhabiting each gall; height 3.0 to 6.4 mm, maximum diameter 1.0 to 2.9 mm. Shikotsu-kohan, Iburi, 4.IX.1977, S. Yamauchi & J. Yukawa leg. (Fig.H).

Rosa idaeus L. var. *aculeatissimus* C.A. Mey "Ezo-ichigo"

Stem, "Kobu-fushi"^{9,17,19,20}. Probably caused by *Lasioptera rubi* Heeger. new host rec. & new rec. from Hokkaido. Jôzankei, Sapporo, 10.X.1975, K. Yamagishi leg.

Leguminosae

Amphicarpaea edgeworthii Benth. var. *japonica* Oliver "Yabu-mame"

Leaf, "Haore" **new gall rec.** Adult unknown. Young leaves folded upward, associated with subglobular swellings of the affected parts; usually many larvae inhabiting a folded leaf. Takaoka, Tomakomai, 4.IX.1977, S. Yamauchi leg. (Fig. I).

Glycine max Merrill "Daizu"

Petiole, "Haguki-fushi"^{7,10,19,20,23}. *Resseliella soya* (Monzen). The authors could not examine the gall from Hokkaido.

Lespedeza bicolor Turcz. "Ezo-yama-hagi"

Leaf, petiole, "Haore" (= "Tamago-fushi")^{6,17,20}. Midge not identified. new rec. from Hokkaido. Tappuyama, Mikasa, 3.IX.1977, J. Yukawa & S. Yamauchi leg.

Pueraria lobata (Willd.) Ohwi "Kuzu"

Leaf, "Ha-marufushi"^{4,17,20}. Midge not identified. new rec. from Hokkaido. Moiwayama, Sapporo, 20.X.1974, T. Sunose leg.; Tappuyama, Mikasa, 3.IX.1977, J. Yukawa & S. Yamauchi leg.

Aquifoliaceae

Ilex crenata Thunb. subsp. *radicans* (Nakai) Tatewaki "Hai-inutsuge"

Axillary bud, "Me-tama-fushi"²⁰. *Asteralobia sasakii* (Monzen). new rec. from Hokkaido. Yakumo, Oshima, 27.V.1977, T. Sunose leg.; Hokkaido Univ. Botanical Garden, Sapporo, 30.VIII.1977, J. Yukawa & S. Yamauchi leg.

Celastraceae

Euonymus fortunei (Turcz.) Hand.-Mazz. var. *radicans* Rehd. "Tsuru-masaki"

Leaf, "Ha-fukure" new name²⁴. *Masakimyia pustulae* Yukawa & Sunose. Moiwayama, Sapporo, 11.V.1975, T. Sunose leg.

Aceraceae

Acer miyabei Maxim. "Ezo-itaya" (= "Kurobi-itaya")

Leaf, "Ha-kubomi" **new gall rec.** Adult unknown. Only a slight swelling and upward arching of the leaf blade; a red larva externally situated on underside of the swelling, producing a brownish circular spot on upper surface of the affected part. Hokkaido Univ. Botanical Garden, Sapporo, 30.VIII.1977, J. Yukawa leg. (Fig. J).

Balsaminaceae

Impatiens nolitangere L. "Ki-tsurifune"

Stem, "Kuki-tama-fushi"^{13,17,19,20}. *Lasioptera impatientis* (Osten Sacken). new rec. from Hokkaido. Hitsujigaoka, Sapporo, 12.X.1975, K. Yamagishi leg.; Moiwayama, Sapporo, 14.X.1975, T. Sunose leg.; Ikeda, Tokachi, 22.IX.1977, T. Sunose leg.; Asari, Otaru, 8.X.1977, T. Sunose leg.

Vitaceae

Ampelopsis brevipedunculata (Maxim.) Trautv. var. *heterophylla* Hara "Nobudô"

Flower bud, "Tsubomi-fushi" **new gall rec.** Adult unknown. Flower bud somewhat swollen, remaining closed; usually one midge larva inhabiting each gall. The galls containing mature larvae fall down to the ground in August and September. Moiwayama, Sapporo, 3.IX.1976, T. Sunose leg. (Fig. K).

Fruit, "Mi-fushi"^{4,8,10,17,19,20}. *Asphondylia baca* Monzen. new rec. from Hokkaido. Moiwayama, Sapporo, 24.X.1974, T. Sunose leg.; Asari, Otaru, 29.VIII.1977, T. Sunose leg.

Vitis coignetiae Pulliat "Yama-budô"

Leaf, "Kobu-fushi"^{17,20}. Adult unknown. new rec. from Hokkaido. Kôshunai, Bibai, 2.IX.1977, J. Yukawa leg.; Takaoka, Tomakomai, 5.IX.1977, J. Yukawa leg.

Leaf, "Tokkuri-fushi" (= "Eboshi-fushi")^{4,17,20}. ? *Cecidomyia viticola* Osten Sacken. new rec. from Hokkaido. Shikotsu-kohan, Iburi, 4.IX.1977, J. Yukawa leg.; Takaoka, Tomakomai, 5.IX.1977, J. Yukawa leg. (Fig. L).

Stem, petiole, "Tsuru-fushi"^{17,20}. *Dasineura vitis* Felt. new rec. from Hokkaido. Hokkaido Univ. campus, Sapporo, 3.IX.1974, T. Sunose leg.; Hokkaido Univ. Botanical Garden, Sapporo, 30.VIII.1977, J. Yukawa leg.

Tiliaceae

Tilia japonica Simk. "Shinanoki"

Leaf, "Ha-kobu-fushi" **new gall rec.** Adult unknown. Subglobular, reddish swelling on upper and lower surfaces; diameter about 2.5 mm, thickness about 1.8 mm; monothalamus. Moiwayama, Sapporo, 3.VI.1974, T. Sunose leg. (cf. *Tilia maximowicziana*, Fig. M).

Petiole, peduncle, "E-fukure"^{6,20}. *Contarinia tiliarum* Kieffer. new rec. from Hokkaido. Yamabe, Furano, 5.VII.1977, K. Yamagishi leg.

Tilia maximowicziana Shirasawa "Ôba-bodaiju"

Leaf, "Ha-kobu-fushi" **new gall rec.** Adult unknown. This gall is identical with that produced on *Tilia japonica*. Moiwayama, Sapporo, 6.VI.1978, T. Sunose leg. (Fig. M).

Petiole, peduncle, "E-fukure"^{6,20}. *Contarinia tiliarum* Kieffer. new host rec. & new rec. from Hokkaido. This gall is identical with that produced on *Tilia japonica*. Moiwayama, Sapporo, 6.VI.1978, T. Sunose leg.

Araliaceae*Aralia cordata* Thunb. "Udo"

Fruit, "Mi-fushi" **new gall rec.** Adult unknown. Galled fruit somewhat irregularly swollen, a little larger than normal one; one to several larvae inhabiting each galled fruit. Shikotsu-kohan, Iburi, 4.IX. 1977, S. Yamauchi leg. (Fig. N).

Caprifoliaceae*Weigela hortensis* (Sieb. et Zucc.) K. Koch "Tani-utsugi"

Axillary bud, "Me-fukure" (= "Me-fushi")^{4,9,17,19,21}. *Asphondylia diervillae* Felt. new rec. from Hokkaido. Asari, Otaru, 10.VI.1978, T. Sunose leg.; Toyotaki, Sapporo, 24.VI.1978, T. Sunose leg.

Valerianaceae*Patrinia villosa* (Thunb.) Juss. "Otoko-eshi"

Fruit, "Mi-fushi"^{4,17,19,21}. *Asphondylia patriniae* (Shinji). new rec. from Hokkaido. Takaoka, Tomakomai, 5.IX.1977, S. Yamauchi & J. Yukawa leg.

Campanulaceae*Adenophora triphylla* (Thunb.) A. Dc. subsp. *aperticampanulata* Kitam. "Tsurigane-ninjin"

Flower bud, "Tsubomi-fushi"^{4,21}. Adult unknown. new rec. from Hokkaido. Takaoka, Tomakomai, 5.IX.1977, S. Yamauchi & J. Yukawa leg.

Compositae*Artemisia montana* (Nakai) Pamp. "Yama-yomogi" (= "Ôyomogi")

Axillary bud, "Tsubo-fushi" (= "Kuki-tsubo-fushi")^{4,9,17,19,21}. *Misopatha artemisiae* Shinji. new host rec. & new rec. from Hokkaido. Kôshunai, Bibai, 2.IX.1977, J. Yukawa leg.; Shikotsu-kohan, Iburi, 4.IX.1977, J. Yukawa leg.; Shiranuka, Kushiro, 22.IX.1977, T. Sunose leg., Asari Otaru, 7.X.1977, T. Sunose leg.

Leaf, "Eboushi-fushi" (= "Ha-tsubo-fushi")^{3,4,17,19,21}. *Diathromyia yomogicola* (Matsumura). Oshidomari, Rishiri I., Sôya, 2.IX.1975, T. Sunose leg.; Kôshunai, Bibai, 2.IX.1977, J. Yukawa leg.; Shikotsu-kohan, Iburi, 4.IX.1977, J. Yukawa leg.; Shiranuka, Kushiro, 22.IX. 1977, T. Sunose leg.

Leaf, "Ke-tama-fushi" (= "Shiro-kefushi")^{4,8,9,17,19,21}. *Rhopalomyia cinerarius*

Monzen. new host rec. & new rec. from Hokkaido. Kôshunai, Bibai, 2.IX.1977, J. Yukawa leg.; Ikeda, Tokachi, 22.IX.1977, T. Sunose leg.; Shiranuka, Kushiro, 22.IX.1977, T. Sunose leg.; Asari, Otaru, 7.X.1977, T. Sunose leg.

Stem, "Kobu-fushi"^{4,8,9,19,21}). *Rhopalomyia struma* Monzen. new rec. from Hokkaido. Yamabe, Furano, 6.VII.1977, K. Yamagishi leg.; Shikotsu-kohan, Iburi, 4.IX.1977, J. Yukawa leg.; Shiranuka, Kushiro, 22.IX.1977, T. Sunose leg.

Stem, "Tsuto-fushi" **new gall rec.** Adult unknown. Elongated, spindle-shaped swelling on the stem; one to several larvae inhabiting each gall. This gall is similar in shape to the stem galls produced on *Artemisia* species by other insects than gall midge^{4,17}). This gall is, however, distinguished from them by the fact that it is apparently caused by a gall midge species. Shiranuka, Kushiro, 22.IX.1977, T. Sunose leg.; Asari, Otaru, 7.X.1977, T. Sunose leg. (Fig. O).

Aster glehni Franch. et Sav. "Gomana" (including "Ezo-gomana")

Flower, "Hana-fushi" **new gall rec.** Adult unknown. Irregularly subglobular swelling on the flower; maximum diameter 5 to 12 mm, height 5 to 8 mm; polythalamus. This gall is quite similar in appearance to those produced on *Aster scaber* and *Eupatorium chinense* var. *simplicifolium*^{17,21}). Kabuka, Rebun I., Sôya, 4.IX.1975, T. Sunose leg.; Moiwayama, Sapporo, 3.IX.1976, T. Sunose leg.; Kôshunai, Bibai, 2.IX.1977, J. Yukawa & S. Yamauchi leg.; Usuzan, Tôya-mura, Iburi, 10.IX.1977, T. Kumata leg. (Fig. P).

Leaf, "Ha-kubomi" **new gall rec.** Adult unknown. Only a slight swelling and upward arching of the leaf blade; a milky white larva externally situated on underside of the swelling, producing a brownish circular spot on upper surface of the affected part. Kôshunai, Bibai, 2.IX.1977, J. Yukawa & S. Yamauchi leg.

Eupatorium chinense L. subsp. *sachalinense* (Fr. Schmidt). Kitam. "Yotsuba-hiyodori"

Flower, "Hana-fushi"^{17,21}). Adult unknown. new host rec. & new rec. from Hokkaido. Kôshunai, Bibai, 2.IX.1977, J. Yukawa leg.

Stem, "Zui-fushi"^{17,19,21}). *Lasioptera eupobiae* Shinji. new host rec. & new rec. from Hokkaido. Kôshunai, Bibai, 2.IX.1977, S. Yamauchi leg.

Eupatorium chinense L. var. *simplicifolium* (Makino) Kitam. "Hiyodori-bana"

Flower, "Hana-fushi" (? = "Mi-fushi")^{17,21}). Adult unknown. new rec. from Hokkaido. Moiwayama, Sapporo, 11.X.1975, K. Yamagishi leg.; Takaoka, Tomakomai, 5.IX.1977, J. Yukawa & S. Yamauchi leg.

Stem, "Zui-fushi" (= "Kuki-fushi")^{17,19,21}). *Lasioptera eupobiae* Shinji. new rec. from Hokkaido. Moiwayama, Sapporo, 11.X.1975, K. Yamagishi leg.; Takaoka, Tomakomai, 5.IX.1977, J. Yukawa & S. Yamauchi leg.; Shiranuka, Kushiro, 22.IX.1977, T. Sunose leg.

Senecio cannabifolius Less. "Hangonsô"

Flower, axillary bud, "Tama-fushi"^{5,21}). Adult unknown. new rec. from Hokkaido. Kabuka, Rebun I., Sôya, 4.IX.1975, T. Sunose leg.; Kôshunai, Bibai, 2.IX.1977, S. Yamauchi & J. Yukawa leg.; Shikotsu-kohan, Iburi, 4.IX.1977, J. Yukawa leg.

Tarazacum platycarpum Dahlst. "Tanpopo"

Leaf, "Ha-fukure"^{6,21}). Adult unknown. new rec. from Hokkaido. Kôshunai, Bibai, 2.IX.1977, S. Yamauchi & J. Yukawa leg.

Gramineae

Sasa kurilensis Makino et Shibata "Chishima-zasa"

Bud, "Hime-sasauo-fushi"²¹⁾. Adult unknown. new host rec. & new rec. from Hokkaido. Himenuma, Rishiri I., Sôya, 3.IX.1975, T. Sunose leg.; Kabuka, Rebun I., Sôya, 4.IX.1975, T. Sunose leg.

Bud, "Sasauo-fushi"^{4,8,10,19,21)}. *Hasegawaia sasacola* Monzen. new rec. from Hokkaido. Moiwayama, Sapporo, 29.XI.1974, T. Sunose leg.; Himenuma, Rishiri I., Sôya, 3.IX.1975, T. Sunose leg.

Sasa senanensis Rehd. "Kumai-zasa"

Bud, "Sasauo-fushi"^{4,8,10,19,21)}. *Hasegawaia sasacola* Monzen. new host rec. & new rec. from Hokkaido. Moiwayama, Sapporo, 7.I.1975, T. Sunose leg.; Hokkaido Univ. Botanical Garden, Sapporo, 30.VIII.1977, T. Sunose & J. Yukawa leg.

Summary

In the present paper, 51 sorts of midge gall on 40 plant species are listed, together with the collecting data and some literature citations. Sixteen sorts of gall on 13 plant species are recorded, for the first time, from Japan, and these are briefly described under new Japanese names. Seven plant species are newly recognized as host plants of gall midges. As a result, the number of sorts of midge gall in Japan now stands at about 230.

Acknowledgements

The present authors would like to express their hearty thanks to Dr. K. Kamijo (Hokkaido Forest Exp. Stn.), Dr. T. Kumata, Dr. K. Ishigaki (Hokkaido Univ.), Mr. K. Yamagishi (Kyushu Univ.) and Mr. S. Yamauchi (Kagoshima Univ.) for their kind help in collecting midge galls. Gall-bearing plants were identified by Dr. K. Ito (Hokkaido Univ.) and Dr. K. Kikuzawa (Hokkaido Forest Exp. Stn.), to whom the authors are deeply indebted. Their thanks are also due to Prof. A. Nagatomi (Kagoshima Univ.) and Prof. T. Nakashima (Hokkaido Univ.) for their encouragement and support.

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Explanation of figures

- Fig. A. Leaf gall, “Haberi-ore” on *Quercus mongolica* var. *grosseserrata*, “Mizu-nara”
 Fig. B. Leaf gall, “Haore” on *Ulmus davidiana* var. *japonica*, “Haru-nire”
 Fig. C. Leaf gall, “Hime-tsubo-fushi” on *Ulmus davidiana* var. *japonica*, “Haru-nire”
 Fig. D. Fruit gall, “Mi-fushi” on *Boehmeria speciosa*, “Akaso”
 Fig. E. Leaf gall, “Ha-kobu-fushi” on *Laportea bulbifera*, “Mukago-irakusa”
 Fig. F. Leaf, petiole, stem gall, “Haguki-fushi” on *Urtica platyphylla*, “Ezo-irakusa”
 Fig. G. Leaf gall, “Ha-maki” on *Polygonum sachalinensis*, “Ôitadori”
 Fig. H. Leaf gall, “Hoso-tsubo-fushi” on *Filipendula purpurea*, “Kyôganoko”
 Fig. I. Leaf gall, “Haore” on *Amphicarpaea edgeworthii* var. *japonica*, “Yabu-mame”
 Fig. J. Leaf gall, “Ha-kubomi” on *Acer miyabei*, “Ezo-itaya”
 Fig. K. Flower bud gall, “Tsubomi-fushi” on *Ampelopsis brevipedunculata* var. *heterophylla*, “Nobudô”
 Fig. L. Leaf gall, “Tokkuri-fushi” on *Vitis coignetiae*, “Yama-budô”
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 Fig. N. Fruit gall, “Mi-fushi” on *Aralia cordata*, “Udo”
 Fig. O. Stem gall, “Tsuto-fushi” on *Artemisia montana*, “Yama-yomogi”
 Fig. P. Flower gall, “Hana-fushi” on *Aster glehnii*, “Gomana”



