 Tribe 7. Eupatorieae

A. Anthers with appendage at apex; pappus of bristles or setose tipped scales (Subtribe I. Ageratinae)
B. Pappus of capillary bristles .......................................................... 78. Eupatorium
B. Pappus of 5–6 distinct, shortly setose tipped scales ........................................... 79. Ageratum
A. Anthers without appendage at apex; pappus clavate (Subtribe II. Piquerinae) .............. 80. Adenostemma

Subtribe I. Ageratinae

78. Eupatorium L.


Note: In the genus Eupatorium, about 2000 species had been included until King and Robinson revised it in a series of taxonomic papers published from 1960s to 1980s. They split the genus Eupatorium into a lot of new genera and their system is comprehensively summarized in their monograph published in 1987. In the current concept, the genus Eupatorium includes 23 North American, about 25 Asian and an European species.

Among Japanese species of the genus Eupatorium, E. lindleyanum, E. glehni, E. makinoi and E. variabile include sexual diploids and agamosperous polyploids. These four species are distinct in the diploid level, but the boundaries are unclear in the polyploid level because agamosperous polyploids with intermediate morphology are common. These intermediates are probably of hybrid origin. Among them, the intermediates between E. lindleyanum and E. makinoi are named as E. tripartitum, and the intermediates between E. variabile and E. makinoi are named as E. laciniatum. Because these intermediates reproduce agamosperously and are common in the field, they are treated as species, not as hybrids in the following description.

A. Stems curved on the base; rhizomes creeping. Leaves opposite, frequently trilobed, lustrous, without gland. Flowers strongly fragrant
A. Stem erect; rhizome erect. Flowers not or slightly fragrant .............................................. 1. E. japonicum
B. Leaves and stems densely hairy
C. Leaves ovate to ovate-lanceolate, trifid, triparted, or trisected; apical lobes often further triparted; petioles 2–4 cm long .......................................................... 2. E. formosanum
C. Leaves linear-lanceolate, simple or trisected, sessile or subsessile
D. Stems thin, lower than 60 cm .................................................................................. 3. E. lindleyanum
D. Stems robust, taller than 60 cm .................................................................................. 4. E. tripartitum
B. Leaves and stems glabrescent or sparsely hairy
C. Leaves verticillate, lanceolate, sparsely hairy, simple, glandular; stems sparsely hairy .............................................. 5. E. glehni
C. Leaves opposite
E. Leaves triparted or trisected
F. Leaves narrowly cuneate at base; lobes grossly serrate, linear-lanceolate, acuminate at apex, glandular .......................................................... 6. E. yakushimense
F. Leaves widely cuneate or rounded at base; lobes finely serrate, oblong-lanceolate, apex acute or obtuse
G. Leaves not lustrous, hairy, usually densely glandular, base usually cuneate; petioles usually less than 1 cm long ................................................................ 7. E. makinoi
G. Leaves lustrous, glabrescent, not or sparsely glandular, base usually rounded; petioles usually more than 1 cm long
H. Stems usually less than 80 cm. Leaves not glandular ............................................................................................ 8. E. variabile
H. Stems usually more than 80 cm. Leaves sparsely glandular ............................................................................................ 9. E. laciniatum
E. Leaves entire
F. Leaves not lustrous, hairy, usually densely glandular, base usually cuneate; petioles usually less than 1 cm long ........................................................................ 7. E. makinoi
F. Leaves lustrous, glabrescent, glandular or not glandular, base usually rounded; petioles usually more than 1 cm


Japanese name: Fuji-bakama.

Perennial occurring in moist grassland along river banks, having many creeping rhizomes by which plants propagate vegetatively. Flowering stems curved on the base, 1–2 m tall, glabrescent or sparsely hairy, ending in corymb with many heads from August to September. Leaves opposite, oblanceolate to oblanceolate, 8–13 cm long, usually trifoliate, serrate, apex acuminate, base acute, with 5–10 mm long petioles, lustrous, sparsely hairy, without gland. Flowers strongly fragrant; corolla 4–6 mm long, purpurel; involucral bracts 7–8 mm; pappus 5–6 mm long; achenes 2.5–3 mm.

Chromosome number: 2n = 40.

Japan: Honshu, Shikoku and Kyushu.


Note: This species has often been claimed to be introduced from China. This is because the species is often cultivated in the garden as a member of the seven popular flowers in autumn ("Aki-no-nanakusa") while its natural habitats are rare and not well studied. Recently, the authors confirmed that the species is a member of natural moist grassland flora on river banks in Kanto Dist. Due to urbanization of Kanto Dist., the habitats are now restricted to very small area, and the species is endangered. Some limited number of habitats are known from the other part of Honshu, Shikoku, and Kyushu.


*Eupatorium quasitrifurtum* Hayata in Icon. Pl. Formos. 8: 44 (1919).

Japanese name: Taiwan-hiyodori, Taiwan-hiyo-modori.

Weedy perennial common in roadsides of Okinawa and Yaeyama Islands. Flowering stems, 1–1.5 m high, densely hairy, often lignified at base, ending in corymb with many heads from January to August. Leaves opposite, ovate to ovate-lanceolate, 5–15 cm long, 2.5–10 cm wide, trifid, tripertated, or trisected with apical lobes often further triparted, irregularly serrate, apex obtuse or acute, base obtuse or truncate, petiole 2–4 cm long, densely hairy, glandulate. Corolla 2.5–3 mm long, white or slightly purplish; involucral bracts 3–4 mm long; pappus 3–4 mm long; achenes 2–2.5 mm long.

Chromosome number: 2n = 20.

Japan: Ryukyu.


Japanese name: Sawa-hiyodori.

Perennial occurring in open moist places. Flowering stems, 40–100 cm tall, densely hairy, ending in corymb with many heads from August to October. Leaves opposite, linear, elliptic lanceolate, or elliptic, 6–12 cm long, 0.5–2.5 cm wide, simple and triprinerved, or trisected and apparently verticillate, serrate with obtuse teeth, apex and base obtuse. sessile, densely hairy. glandular. Corolla 3.5–4.5 mm long, purpurel; involucral bracts 4–6 mm long; pappus 5–6 mm long; achenes 2.5–3 mm long.

Chromosome number: 2n = 20, 30, 40, 50.

Japan: Hokkaido, Honshu, Shikoku, Kyushu and Ryukyu.


Note: Polyploids reproduce agamospermously while diploids reproduce sexually. Agamospermous polyploids are widespread.


Japan: C. Honshu (Chiba Pref. and Izu Islands). Endemic.


Perennial occurring in open moist places. Flowering
intermediates are regarded as hybrid derivatives between two species.

var. oppositifolium (Koidz.) Kawahara et Yahara, comb. nov.


Japanese name: Hiyodoribana baisū-tai, Ōhiyodoribana.

Japan: Hokkaido, Honshu, Shikoku and Kyushu.

Distr.: Japan, Korea and China.

Icones: Kitamura et al., Herb. Pl. 1: t. 29 223; Masamune, Ill. Fl. Nippon 6(2): 199, 200, upper, as var. angustatum; Terasaki, rev. ed.: t. 2934; Makino, rev. ed.: t. 2952.

Note: Agamospermous polyploids of E. makinai are morphologically distinct from the sexual diploids and are treated here as var. oppositifolium. Var. oppositifolium differs from var. makinai in higher stems (30–150 cm tall), larger leaves (7–17 cm x 2–5 cm), larger corolla (3.5–5 mm), and longer pappus (4–5.5 mm). Var. oppositifolium occurs in open or half-open places along forest margins, along road sides or in grasslands while var. makinai prefers more shaded places in or along forests. E. makinai var. oppositifolium intergrades with agamospermous races of E. lindleyanum, E. glehni and E. variabile.


Japanese name: Yama-hiyodori.

Perennial occurring in open or half-open places along margins of evergreen forests. Flowering stems, 40–120 cm tall, glabrescent, ending in corymbs with a few to many heads from September to November. Leaves opposite, obovate to elliptic lanceolate, 4–8 cm long, 2.5–5 cm wide, trinerved, simple or deeply dissected with lobes rounded at apex, serrate with obtuse teeth, apex acute, truncate, base rounded or cordate, petiole 4–20 mm long, nearly glabrous, lustrous above, without glands beneath. Corolla 3–4 mm long, white; involucral bracts 3–5 mm long; pappus 3–4.5 mm long; achenes 2.5–3 mm long.

Chromosome number: 2n = 20.


Japanese name: Hiyodoribana baisū-tai, Ōhiyodoribana.

Japan: Hokkaido, Honshu, Shikoku and Kyushu.

Distr.: Japan, Korea and China.

Icones: Kitamura et al., Herb. Pl. 1: t. 29 223; Masamune, Ill. Fl. Nippon 6(2): 199, 200, upper, as var. angustatum; Terasaki, rev. ed.: t. 2934; Makino, rev. ed.: t. 2952.

Note: Agamospermous polyploids of E. makinai are morphologically distinct from the sexual diploids and are treated here as var. oppositifolium. Var. oppositifolium differs from var. makinai in higher stems (30–150 cm tall), larger leaves (7–17 cm x 2–5 cm), larger corolla (3.5–5 mm), and longer pappus (4–5.5 mm). Var. oppositifolium occurs in open or half-open places along forest margins, along road sides or in grasslands while var. makinai prefers more shaded places in or along forests. E. makinai var. oppositifolium intergrades with agamospermous races of E. lindleyanum, E. glehni and E. variabile.


Japanese name: Yama-hiyodori.

Perennial occurring in open or half-open places along margins of evergreen forests. Flowering stems, 40–120 cm tall, glabrescent, ending in corymbs with a few to many heads from September to November. Leaves opposite, obovate to elliptic lanceolate, 4–8 cm long, 2.5–5 cm wide, trinerved, simple or deeply dissected with lobes rounded at apex, serrate with obtuse teeth, apex acute, truncate, base rounded or cordate, petiole 4–20 mm long, nearly glabrous, lustrous above, without glands beneath. Corolla 3–4 mm long, white; involucral bracts 3–5 mm long; pappus 3–4.5 mm long; achenes 2.5–3 mm long.

Chromosome number: 2n = 20.

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stems, 50–150 cm tall, densely hairy, ending in corymbs with many heads from August to October. Leaves opposite, elliptic, 6–17 cm long, 2–5 cm wide, triparted or trisected and apparently verticillate, serrate, apex acute, base acute or obtuse, petaled short (1–5 mm long), densely hairy, glandular. Corolla 3.5–5 mm long, purplish; involucral bracts 4–6 mm long; pappus 5–6 mm long; achenes 3–5 mm long.

Chromosome number: 2n = 30, 40.

Japanese name: Hokkaido, Honshu, Shikoku and Kyushu.

Distr.: Japan, Korea and China.


Note: This polyploid species is all-agamospermous and morphologically intermediate between E. lindeleanum and E. makinoi. It is considered to be of hybrid origin between these two species both of which include sexual and agamospermous races. Typical plants of E. tripartitum differ from E. lindeleanum in more robust stems, shortly petiolate leaves, and larger achenes, and differ from E. makinoi in densely hairy stems, shorter petals, and purplish flowers. However, E. tripartitum often intergrades with agamospermous races of E. lindeleanum and E. makinoi and the boundaries among these three are not clear.


Perennial occurring in open grasslands or half-open forest margins. Flowering stems, 70–180 cm tall, sparsely hairy, ending in corymbs with many heads from July to September. Leaves verticillate with 3–5(–7) leaves at a node, elliptic lanceolate to lanceolate, 7–20 cm long, 1–7 cm wide, simple, serrate, apex acute or acuminate, base acute or obtuse, petiole short (1–5 mm long), sparsely hairy, glandular. Corolla 3.5–5 mm long, purplish; involucral bracts 4–6.5 mm long; pappus 3–6 mm long; achenes 2.5–3 mm long.

Chromosome number: 2n = 20, 30, 38, 40, 50.

Japanese name: S. Kuriles, Hokkaido, Honshu and Shikoku.

Distr.: Japan, Sakhalin and the Kuriles.

Icones: Kitamura et al., Herb. Pl. 1: t. 29 225; Terasaki, rev. ed.: t. 2932; Satake et al., Herb. Pl. 3: photo. 187 2; Makino, rev. ed.: t. 2953.

Note: Polyploids reproduce agamospermy while diploids reproduce sexually. Sexual diploids are common in Hokkaido and northern and central parts of Honshu while agamospermous polyploids are common in western Honshu and Shikoku. Agamospermous races of E. glehni intergrade with agamospermous races of E. makinoi and the boundary between these two species is often unclear.


Japanese name: Yakushima-hiyodori.

Perennial occurring on moist rock wall along open stream margin. Flowering stems, 30–90 cm tall, glabrescent, ending in corymbs with many heads from August to October. Leaves opposite, 5–15 cm long, deeply triparted with lobes narrow lanceolate to linear, serrate with acute teeth, apex acuminate, base acute or obtuse, petiole 5–20 mm long, lustrous, glabrescent, glandular. Corolla ca. 4 mm long, white or purplish; involucral bracts 4–5 mm long; pappus ca. 5 mm long; achenes 2.5–3 mm long.

Japanese name: Kyushu (Yakushima). Endemic.


7. Eupatorium makinoi Kawahara et Yahara, nom. nov.


var. makinoi


Perennial occurring in shaded or half-open places of forest understories or forest margins. Flowering stems, 10–100 cm tall, sparsely hairy, ending in corymbs with a few to many heads from July to September. Leaves opposite, obovate to lanceolate, 4–13 cm long, 1–4 cm wide, simple or deeply dissected, serrate, apex acute, base obtuse, petiole 3–20 mm long, sparsely hairy, glandular. Corolla 2.5–4 mm long, purplish; involucral bracts 3–5 mm long; pappus 2.5–4.5 mm long; achenes 2.5–3 mm long.

Chromosome number: 2n = 20.

Japanese name: Honshu (Shizuoka Pref., Kii Peninsula, Chugoku Dist.), Shikoku and Kyushu.

Distr.: Japan and China.

Icones: Satake et al., Herb. Pl. 3: photo. 187 1.

Note: This species has been included in E. chinense because E. makinoi intermediates with E. chinense in China. However, the intermediates are all agamospermous. Sexual populations of E. chinense found in the southeastern part of China are morphologically distinct from sexual populations of E. makinoi in Japan. The
ASTERACEAE (COMPOSITAE)

Japanese name: Sawa-shima-fujibakama.
Presumption: E. lindleyanum × E. luchuense.

Presumption: E. lindleyanum × E. japonicum.

79. Ageratum L.

A. Involucre glabrous or with long, nonviscid hairs, not glandular ......................................................... 1. A. conyzoides
A. Involucre stipitate glandular and long hairy .................................................................................................. 2. A. houstonianum

Japanese name: Kakkō-azami.
Japan: Naturalized in Ryukyu.
Distr.: A native of tropical America.

Japanese name: Murasaki-kakkōazami.
Japan: Naturalized in Ryukyu.
Distr.: A native of tropical America.

Subtribe II. Piquerinae


   Japanese name: Numa-daikon.
   Erect, perennial herbs from fibrous rhizomes; stems 30–100 cm tall, lower part of stem rooting, more or less creeping, puberulent at apex; branches often spreading. Leaves 4–8, cauline, opposite; lower leaves smaller, usually withering before flowering; median leaves ovate or ovate-oblong, 4–20 cm long, 3–12 cm wide, base rounded-cuneate, obtusely toothed, sparsely pilose, petiole 1–6 cm long; upper leaves oblong, linear in inflorescence. Heads discoid, 9–10 mm across, in loose panicles; peduncle slender, 1.5–3 cm long, densely hairy; involucre subglobose, ca. 4 mm high; phyllaries in 2 series, equal, connate at base, narrowly oblong, apex rounded, reflexed. Flowers September to November; ca. 30 per head, white, bisexual, corolla 2.5 mm long, densely hairy, tube glandular pilose. Style branches dilate at upper part, much exceeding corolla, ca. 2.5 mm long. Achenes ob lanceolate, ca. 4 mm long, tubercled, whitish brown or sometimes smooth, blackish, rounded at apex, narrowed to base. Pappus of 3 or 4 thick spreading setae, ca. 1 mm long.
   Chromosome number: 2n = 20.
   Japan: Honshu, Shikoku, Kyushu and Ryukyu. Wet ground along streams in lowlands and low mountains.
   Distr.: Japan, Taiwan, S. China, SE Asia, India and Sri Lanka.
   Icones: Kitamura et al., Herb. Pl. 1: t. 164; Masamune, Ill. Fl. Nippon 6(2): t. 204; Satake et al., Herb. Pl. 3: photo. 187 3; Makino, rev. ed.: t. 2949, as Adenostemma viscousum.