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A new species of *Eclipta* (Compositae: Heliantheae) and its allies in eastern Asia

SHINYA UMEMOTO* & HIROSHIGE KOYAMA**

ABSTRACT. *Eclipta* (Compositae: Heliantheae) in eastern Asia is taxonomically revised, and four species are recognized, of which *E. angustata* is described here as new. One species, *Eclipta alba*, is introduced from the New World, and the other three species are endemic in eastern Asia. *Eclipta prostrata* and *E. angustata* are distributed in Thailand as well as in the neighbouring areas, but *E. thermalis* is known in the temperate regions of eastern Asia.

KEYWORDS: Asteraceae, achene morphology, leaf morphology, distribution.

INTRODUCTION

Eclipta L. is a small genus in the family Compositae (tribe Heliantheae), of which several species are distributed primarily in the New World and some in the Old World. One species, *Eclipta prostrata* sensu auct., is considered to be a widespread weed mainly in tropical and subtropical regions but also northward into temperate regions in East Asia (Kitamura, 1942; Huang; 1979, Koyama & Boufford, 1981; Koyama, 1985; Grierson & Long, 2001). It is commonly found in rice fields as well as waste and moist places by streamlets throughout Japan from Ryukyu to the northern part of Honshu.

In the course of our taxonomic studies of Eastern Asiatic regions, we found that *Eclipta prostrata* sensu auct. was variable in leaf shape, hairiness on stems and peduncles, and in surface features of the achenes.

Characters of the surface and shape of the achenes are considered to be diagnostic in *Eclipta*. There are two shapes of achenes in outline: obovate and angular obovate. In the obovate achene, there are winged parts on both sides, but in the angular obovate achene, there are no winged parts at all. There are many tubercles on the surface of achenes which are of two general patterns: in one they are conspicuous and the other inconspicuous. Sometimes, tubercles are clustered and form short ridges or a long ridge for the entire length of the achene. By analyzing the shape and surface features of achenes we can safely recognize three morphological types as shown in Fig. 1. One type is characterized by being obovate in outline and in having numerous tubercles in the centre but lacking tubercles along the margins of both sides. The second type is slender obovate in outline and has a

* Kii-oshima Research Station, Division of Human Ecosystem, Field Science Education and Research Centre, Kyoto University: Sue, Kushimoto-cho, Wakayama, 649-3632 Japan.

** Curator emeritus, Department of Botany, National Museum of Nature and Science: Amakubo 4-1-1, Tsukuba-shi, Ibaraki, 305-0005 Japan.

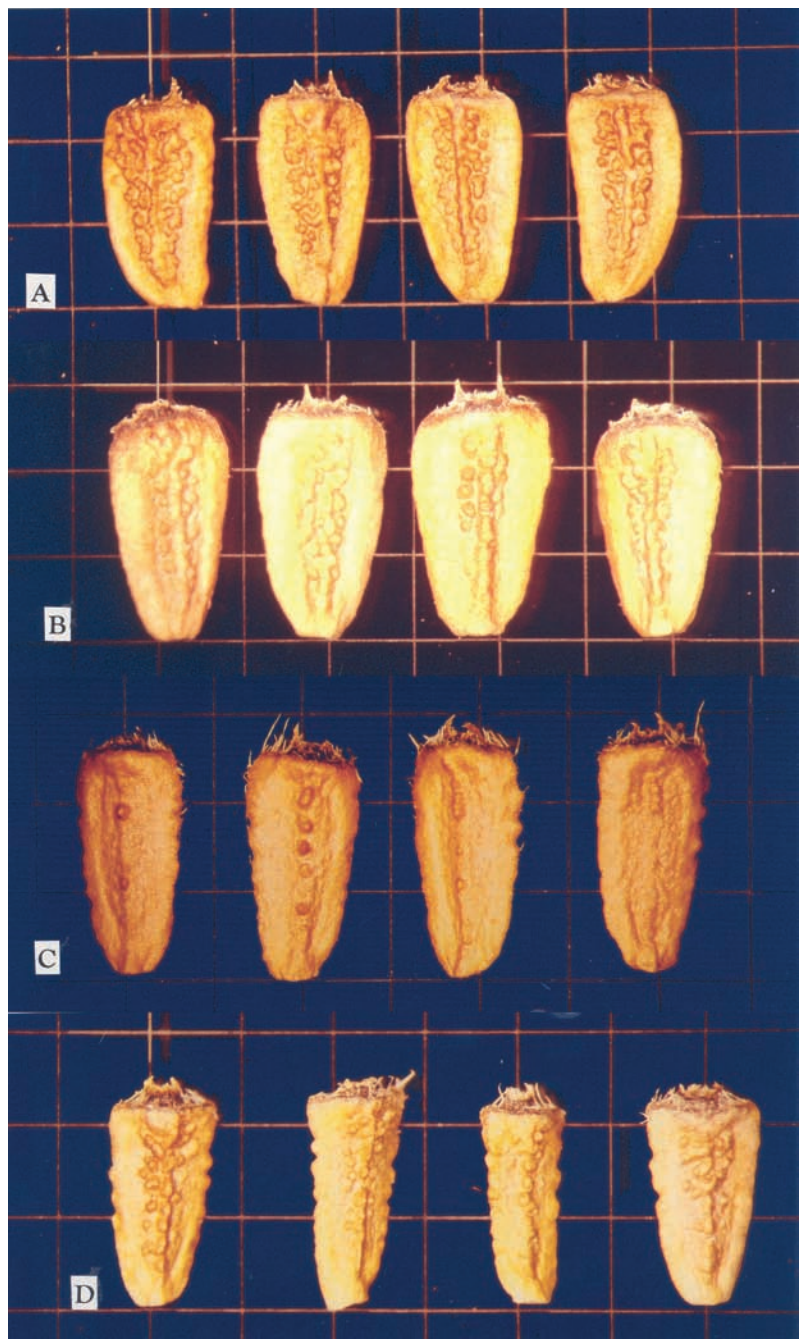

Figure 1. Achenes of four species. A. *Eclipta angustata*; B. *E. thermalis*; C. *E. prostrata*; D. *E. alba*. Three types are recognized in the tubercle features of achenes.

few tubercles in the centre and along the margins of both sides. The third type is slender in outline and has numerous tubercles both in the centre and along the margins.

Leaf shapes and margins are also diagnostic characters. There are three basic leaf-shapes: oblong, lanceolate and linear-lanceolate as shown in Fig. 2. Leaf margins are either roughly-dentate like those of *Quercus serrata* or if each dentation is low, then the margin is crenate or entire.

As mentioned, *Eclipta prostrata* sensu auct. is considered to be variable in leaf shape, hairiness of peduncles and in features of the achenes. By careful observations on the form of achenes and on leaf-shapes we concluded that *E. prostrata* sensu auct. might comprise two or more distinct taxa. *Eclipta prostrata* (L.) L. is distinguished from *E. alba* (L.) Hassk. by the form of hairs on stems, leaves and peduncles and by the shape of achenes. That is, *E. prostrata* has multi-cellular hairs and obovate achenes, while *E. alba* four-cellular hairs and angular obovate achenes. *Eclipta angustata*, proposed here, is distributed in Southeast Asia, and is distinct from *Eclipta thermalis* Bunge which occurs in more northern regions of East Asia.

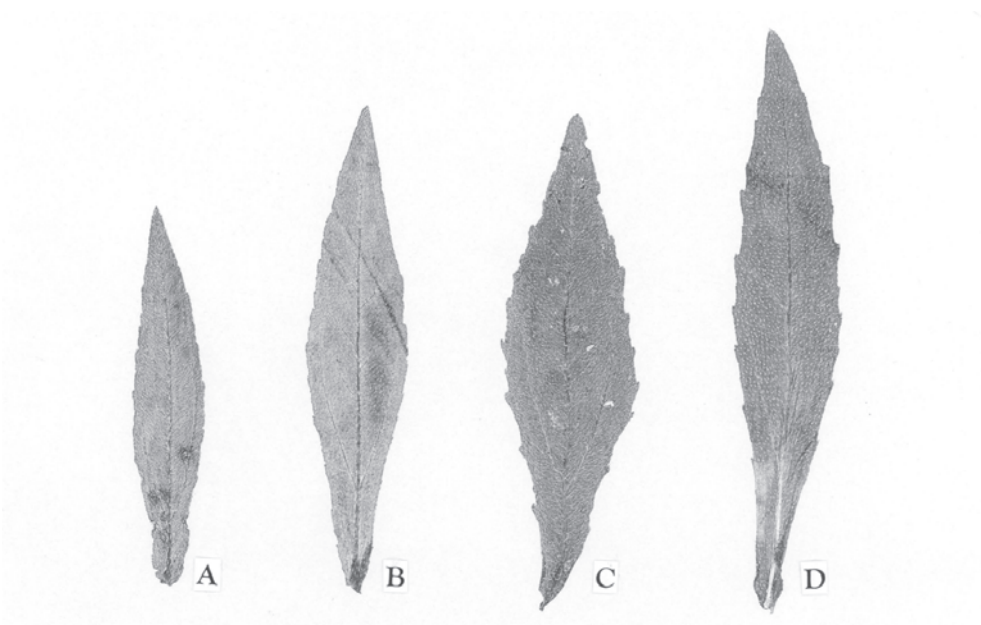

Figure 2. Leaves of four species. A. *Eclipta angustata*; B. *E. thermalis*; C. *E. prostrata*; D. *E. alba*. Two types are recognized in the margins of leaves.

TAXONOMIC TREATMENT

KEY TO THE SPECIES

1. Stems and leaves with long patent multi-cellular hairs; leaves subsessile, the leaf margins wavy; achenes with a few tubercles, usually arranged with a longitudinal row in the centre **1. E. prostrata**
1. Stems and leaves with appressed four-cellular hairs; leaves sessile, the leaf margins wavy or not; achenes with numerous tubercles, arranged longitudinally in more or less several rows in the centre
   2. Leaf-margins wavy; achenes angular obovate, rough all over the surface **2. E. alba**
   2. Leaf-margins not wavy; achenes obovate or subobovate, rough only in the centre, smooth on both sides
      3. Achenes obovate, light-brown, tubercles somewhat inconspicuous; leaves suboblong to lanceolate, margins more or less denticulate **3. E. thermalis**
      3. Achenes subobovate, gold-brown, tubercles conspicuous; leaves lanceolate to linear-lanceolate, margins more or less entire **4. E. angustata**

1. Eclipta prostrata (L.) L., Mant. Pl. 2: 286. 1771; Roxburgh, Fl. Ind. 3: 438. 1832.—*Verbesina prostrata* L., Sp. Pl. 902 (1753). Type: Hort. eltham. 139, t. 113, f. 138 (1732). Habitat in India. *Eclipta zippeliana* Blume, Bijdr. Fl. Nederl. Ind. 914. 1826; Pl. Jav. Rar. 530-531. 1848.—*Eclipta prostrata* var. *zippeliana* (Blume) Koster in Backer & Brink, Fl. Java 2: 402. 1965. Type: Indonesia (Java), *unknown collector* s.n. (L). *Eclipta philippinensis* Gand., Bull. Soc. Bot. France 65: 40. 1918. Type: The Philippines (*Cuming* 2436, syntype, not seen) and New Caledonia (*Debeaux*, syntype, not seen).

Erect or prostrate annual herbs; *stems* reddish, ascending, 5–45 cm tall, often fibrous, rooting at the nodes, stiffly appressed- and patent-pilose. *Leaves* opposite, simple, elliptic-lanceolate, 0.75–5.5 cm long, 1.5–15 mm wide, apex narrowly acute, base narrowed to short petiolate, margins largely serrate, both surfaces stiffly appressed- pilose. *Inflorescences* 1–2 on short peduncles in axils of upper leaves; peduncles slender, 0.5–4 cm long. *Capitula* radiate, ca 6 mm across at flowering, ca 9 mm across in fruit; receptacle flattish, slightly convex, paleaceous; paleae linear, 3–3.5 mm long, appressed-pubescent; *involucres* campanulate, ca 5 mm high, 3–5 mm diam.; *phyllaries* in 2 series, outer phyllaries herbaceous, oblong-ovate, 4–6 mm long, 1.5–3 mm wide, apex acute, covered with stiff, appressed-pilose hairs, inner phyllaries narrower and shorter. *Ray-florets* numerous per capitula in 2–3 series, female, rays white, lanceolate, 1.5–2.5 mm long, ca 0.25 mm wide, apex bifid, minutely hairy; basal tube 0.5 mm long; *disc-florets* 10–15 per capitula, bisexual, corolla white, tubular 1.5–1.75 mm long, apex 4-lobed. *Achenes* oblong or obovate, 3–3.5 mm long, 1.5 mm broad, triquetrous or compressed, with a longitudinal row of tubercles in the centre on each side, margins thinner with some tubercles, apex truncate, sparsely and minutely pubescent; *pappus* 2 minute weak scales ca 0.25 mm long. Chromosome no. 2n=22

Thailand.— NORTHERN: Chiang Rai [Wat Thamsaohin Phayanak, 14 Feb. 1983, *Koyama, Terao & Wongprasert* T-33545 (**KYO**)]; Tak [Lansang National Park, 21 July 1973, *Murata, Fukuoka & Phengklai* T-16629 (**BKF**, **KYO**); Khao Phra War, 21 Jan. 1983, *Koyama, Terao & Wongprasert* T-32839 (**KYO**)]. NORTHEASTERN: Khon Kaen [Phaphuang Forest Park, 21 Dec. 1982, *Koyama, Terao & Wongprasert* T-31510 (**KYO**, **TNS**); Phothiyan Cave, 21 Dec. 1982, *Koyama, Terao & Wongprasert* T-31514 (**KYO**)]; Loei [Ban Wong Wiean, 27 Aug. 1988, *Koyama* T-61363 (**KYO**)].

Burma.— Mandalay Division [Popa Mountain Park, 15 Jan. 2001, *Aye & Htwe* 21328 (**MBK**)]; Sagaing Division [Monywa to Yinmabin, 5 Dec. 2004, *Kobayashi & Hamaguchi* 31465 (**MBK**)].

Distribution.— A weed or equivalent plant of mainly Indian sub-continental distribution; scattered in Southeast Asia.

Ecology.— Moist ground, paddy fields and margins of water storage dams, deciduous, dipterocarp and bamboo forests, at foot of limestone hills, 350–550 m alt.; flowering December to August, probably all the year round.

Notes.— This species is characterized by having soft long hairs along the peduncles, stems and main veins of leaves, and by having oblong or obovate achenes with a few tubercles.

2. Eclipta alba (L.) Hassk., Pl. Java. Rar. 528. 1848.—*Verbesina alba* L., Sp. Pl. 902. 1753. Type: Hort. eltham. 138, t. 113, f. 137 (1732). Habitat in Virginia.

Annual, strigose herbs from fibrous roots; *stems* prostrate, ascending, sometimes erect to 80 cm tall, often fibrous, rooting at nodes. *Leaves* opposite, simple, lanceolate to lanceolate-linear, 2–15 cm long, 0.4–3 cm wide, apex acuminate, base attenuate, margins clearly dentate, both surfaces with stiffly appressed pilose hairs. *Inflorescences* axillary and terminal. *Capitula* radiate, 8–10 mm across after flowering; receptacle flattish or slightly convex, paleaceous; paleae slender, fragile, somewhat bristle-like, central paleae sometimes wanting; *involucres* globose-campanulate, 4–5 mm high, 4–5 mm diam.; *phyllaries* in 1–2 series, outer phyllaries herbaceous or herbaceous-tipped, subequal, inner phyllaries narrower and shorter. *Ray-florets* numerous per capitula, in 2–3 series, female, fertile, rays white, lanceolate, 1.8–2.5 mm long, ca 0.3 mm wide, apex bifid; basal tube 0.2–0.3 mm long; *disc-florets* ca 30 per capitulum, bisexual, corolla white, tubular, ca 1.3 mm long, apex mostly 4-toothed; basal tube ca 0.3 mm long. *Achenes* angular obovate, 2–2.5(–2.8) mm long, rough, often triquetrous and with 1 surface opposite a phyllary, the others generally quadrangular and somewhat compressed along radii of capitula; *pappus* a nearly obsolete crown. Chromosome no. 2n = 22.

Japan.— HONSHU: Kanto [Ibaraki, Tsukuba, 2 July 1997, *Konta & Momose* 179 (**TNS**); Kanagawa, Kamakura, 3 Sept. 1961, *Morimoto* s.n. (**MBK**); Tokyo: Setagaya, 4 Sept. 2003, *Nakaike* s.n. (**TNS**); Tama, 21 July 2001, *Kiyozuka* 1180 (**TNS**)]; Chubu [Aichi, Kasugai, 19 Sept. 1993, *Fukuoka* 2838 (**TNS**); Nagoya, 11 Sept. 1992, *Fukuoka* 1945 (**TNS**); Nukada, 25 July 1990, *Fukuoka* 939 (**TNS**); Gifu, Seki, 23 Aug. 1995, *Takahashi* 16278 (**TNS**); Nagano, Higashi-chikuma, 28 Sept. 1980, *Yokouchi* s.n. (**TNS**); Matsumoto, 22 Aug. 1998, *Shimizu* 42311 (**TNS**); Shimoina, 7 Aug. 1993, *Asano & Asano* 68867 (**MBK**); Shizuoka, Hamamatsu, 9 Oct. 1983, *Toda* s.n. (**TNS**); Mishima, 25 Aug. 1957, *Asahina* s.n. (**TNS**); Shizuoka, 3 Aug. 1974, *Saiki & Konta* 1747 (**TNS**)]; Hokuriku [Ishikawa, Komatsu, 23 Aug. 1996, *Takeuchi* 470 (**TNS**)]; Kinki [Kyoto, Funai, 23 Sept. 1964, *Murata* 19028 (KYO-315) (**TNS**); Kameoka, 28 Sept. 1988, *Takahashi* 972 (**TNS**); Maidzuru, 3 Sept. 1997, *Tsugaru & Takahashi* 25562 (**TNS**); Naka, 15 Sept. 1991, *Nuno* s.n. (**TNS**); Nagaokakyo, 23 Sept. 2001, *Murata & Sawada* 30987 (**MBK**); Takeno, 11 Sept. 1998, *Tsugaru, Murata & Takahashi* 26787 (**TNS**); Osaka, Iwafune, 12 Sept. 1954, *M. Hori* s.n. (**TNS**)]. SHIKOKU: Kochi [Kochi, 20 Aug. 1992, *Koukami* 92-052 (**MBK**); Nagaoka, 28 Aug. 2005, *Hosokawa et al.* FOK-073917 (**MBK**)]. KYUSHU: Fukuoka [Ohmuta, 22 Aug. 1957, *Sugino* 1 (**TNS**); Kumamoto, Hitoyoshi, 6 Sept. 1959, *Mayebara* 6011 (**TNS**)].

Distribution.— Introduced to southeastern and temperate East Asia, possibly indigenous to the New World.

Ecology.— Moist upland fields and orchards, along edges of aqueducts, rather moist roadsides and waste wet places; flowering July to November.

Notes.— The first record for Japan was from material collected by T. Muroi in 1948 after the World War II from Kobe.

3. Eclipta thermalis Bunge, Enum. Pl. Chin. Bor. 39. 1833. Type: *ad thermas prope* Tanschan, China (type not seen). *Eclipta prostrata* sensu Kitamura, Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B. 16 (3): 266. 1942; Huang, Xiu-lan, Fl. Reip. Popul. Sin. 75: 345, Pl. 58-1-5. 1979.

Annual, strigose herbs from fibrous roots; *stems* prostrate, ascending, sometimes erect to 60 cm tall, often fibrous rooting at nodes. *Leaves* opposite, simple, suboblong to lanceolate, 2–13 cm long, 0.4–3.3 cm wide, apex acute, base attenuate, margins subentire, more or less denticulate, both surfaces with stiffly appressed pilose hairs. *Inflorescences* axillary and terminal. *Capitula* radiate, 9–12 mm across after flowering; receptacle flattish or slightly convex, paleaceus; paleae slender, fragile, somewhat bristle-like, central paleae sometimes wanting; *involucres* globose-campanulate, ca 5 mm high, ca 5 mm diam.; *phyllaries* in 2 series, outer phyllaries herbaceous or herbaceous-tipped, subequal, inner phyllaries narrower and shorter. *Ray-florets* numerous per capitulum in 2–3 series, female, fertile, rays white, lanceolate, 1.7–2.0 mm long, ca 0.3 mm wide, apex bifid; basal tube ca 0.6 mm long; *disc-florets* ca 25 per capitulum, bisexual, fertile, corolla white, tubular, ca 1.3 mm long, apex mostly 4-toothed; basal tube ca 0.3 mm long. *Achenes* subobovate, 2–2.8 mm long, rough except for smooth wings, often triquetrous and with 1 surface opposite a phyllary, or the others generally quadrangular and somewhat compressed along radii of capitula; *pappus* a nearly obsolete crown, usually with 2 rather long aristae. Chromosome no. 2n = 22.

Japan.— HONSHU: Tohoku [Aomori, Nishi-tsugaru, 7 Sept. 1961, *Hosoi* s.n. (**TNS**); Yamagata: Yunohama-onsen, 1 Sept. 1960, *Senda* s.n. (**TNS**)]; Kanto [Chiba, Inba, 4 Sept. 2002, *Hasegawa* 17339-3 (**TNS**); Kashiwa, 27 Oct. 1957, *Okuyama* 21069 (**TNS**); Gunma, Ohta, 7 Oct. 1954, *Wakana* s.n. (**TNS**); Ibaraki: Tsukuba, 17 Nov. 1999, *Saeki* 4 (**TNS**); Kanagawa, Fujisawa, 28 Sept. 1931, *Momose* 437 (**TNS**); Saitama; Urawa, 5 Sept. 1947, *Kawasaki* 3408 (**TNS**); Koshigaya, 25 Oct. 1948, *Ohwi* s.n. (**TNS**); Kita-adachi, 1 Aug. 1942, *Suzuki* s.n. (**TNS**); Tochigi, Ashikaga, 13 Aug. 1903, *Aiba* s.n. (**TNS**); Kawachi, Aug. 1931, *Izawa* s.n. (**MBK**); Tokyo, Nerima, 2 Sept. 1951, *Ohkawa* s.n. (**TNS**); Higashi-murayama, 15 Oct. 1933, *Izawa* s.n. (**MBK**); Minami-tama, 23 Aug. 1959, *Morimoto* s.n. (**MBK**)]; Chubu [Aichi, Toyota, 30 Aug. 1933, *Fukuoka* 1933 (**TNS**); Nukada, 30 July 1990, *Fukuoka* 1026 (**TNS**); Nagano, Shimoina, 18 Aug. 1946, *Miyashita* 91 (**TNS**); Hanishina, 18 Aug. 1921, *Tanaka* 65324 (**TNS**); Minami-azumi, 1 Oct. 1921, *Koidzumi* 2229 (**TNS**); Kita-saku, 8 Oct. 1940, *Koidzumi* 112446 (**TNS**); Shizuoka; Atami, 1 Jan. 1932, *Nemoto* s.n. (**TNS**); Fujinomiya, 7 Aug. 1976, *Konta & Takahashi* 191 (**TNS**); Yamanashi: Minami-koma, 25 Oct. 1975, *Kadota* 760 (**TNS**)]; Kinki [Hyogo, Takarazuka, Oct. 1956, *Togashi* s.n. (**TNS**-1495) (**TNS**); Kanzaki, 18 Oct. 1964, *Tagawa & Konta* 582 (**TNS**); Kyoto, Kyoto, 25 Sept. 1936, *Yamamoto* s.n.

(**TNS**); Kameoka, 5 Aug. 1991, *Tsugaru* 14980 (**TNS**); Osaka, Idzumi, 12 Oct. 1972, *Oya* s.n. (**MBK**); Shiga: Gamou, 2 Sept. 1954, *Hashimoto* s.n. (TSM-1146) (**TNS**); Shiga, 2 Oct. 1991, *Murata* 70768 (**TNS**)]; Chugoku [Okayama, Kurashiki, 25 Nov. 1942, *Iki* 8204 (**MBK**); Okayama, 28 Aug. 1976, *Nishihara* 7274 (**MBK**)]. SHIKOKU: Ehime [Matsuyama, 30 Sept. 1984, *Matsumoto* 2527 (**MBK**); Kochi: Tosa, 24 Aug. 1997, *Horiuchi* 9804 (**MBK**); Kochi, 15 Sept. 1992, unknown *collector* 8848 (**MBK**); Hata, 1 Sept. 2002, *Sakai, Sada, Kuroiwa et al.* FOK-044509 (**MBK**); Tokushima: Tokushima, 17 Aug. 1913, *Nikai* 2549 (**TNS**)]. KYUSHU: Fukuoka [Ohmuta, 3 Sept. 1932, *Morikawa* s.n. (**TNS**); Kumamoto; Hitoyoshi, 14 Sept. 1959, *Mayebara* 6010, (**TNS**); Miyazaki, Higashi-usuki, 19 Aug. 1943, *Nagasawa* s.n. (**TNS**); Nichinan, 8 Aug. 1942, *Hattori* 605 (**TNS**); Nagasaki: Ohmura, 10 Aug. 1948, *Toyama* s.n. (**TNS**)]. **China**. ANHUI: [Mt. Qingliang-feng, 25 Oct. 1993, *Konta* CH-3280 (**TNS**)]. HUBEI: [Tschao-Tschao, 11 Aug. 1905, *Chanet* 83 (**TNS**)]. SHANGHAI M.: [Isl. Chongmin, 5 Nov. 1993, *Konta* CH-3333 (**TNS**)]. YUNNAN: [Yunnan-sen, Pro Vicar Apostolic, Nov. 1906, *Maire* 1215 (**TNS**); Pan-larg-se, Mzreres, Nov. ?, *Maire* s.n. (**TNS**)]. ZHEJIANG: [Xihu, July 1927, *Hsia* 7 (**TNS**); Hangzhou C., Oct. 1909, unknown *collector* s.n. (**TNS**)].

Nepal.— [Majenda to Khanchok, 10 Jan. 1979, *Kanai* 670595 (**TNS**)].

Distribution.— A weed traditionally used as a medicinal herb for disinfection, as a vegetable and hair dye (Fukazu, 1979; Nanba, 1986; Umemoto, personal observations), in temperate continental China, Korean Peninsula and the Japanese Archipelago except Hokkaido. Once cultivated occasionally in China (Umemoto, personal observations).

Ecology.— Paddy fields, along edges of aqueducts, wet roadsides and wet waste places; flowering July to November.

Notes.— Archaeological finds of the achenes of this species have been confirmed from the late Johmon Era, approximately in the third century B.C. (Umemoto et al., 1998). Artificial crosses of this species with *E. alba* resulted in ca 50% in pollen fertility (Umemoto et al., 1985).

4. Eclipta angustata Umemoto & H. Koyama, **sp. nov.** Achenia subobovata, 2–2.5(–2.8) mm longa, ca 0.8 mm lata, margine anguste alatae; folia lanceolata aut lineari-lanceolata, margine plus minus subserrulata vel subundulata.— Typus: Thailand, Central, Phra Nakhon, Bang Khen, north of Bangkok, 13 Nov. 1965, *Iwatsuki* T-254, (holotype **KYO**; isotypes **BKF**, **TNS**). Fig. 3.— *Eclipta prostrata* sensu Koyama in Acta Phytotax. Geobot., 36: 63. 1985, p.p. —*Eclipta alba* sensu Kerr, Fl. Siam. Enum., 2 (3): 274. 1936), p.p.

Strigose, annual herbs from fibrous roots; *stems* prostrate, sometimes erect to 60 cm tall, or ascending, often fibrous rooting at nodes. *Leaves* opposite, simple, lanceolate or lance-elliptic to lance-linear, 2–10 cm long, 4–25 mm wide, apex acute, base attenuate, margins slightly serrulate or subentire, both surfaces with stiffly appressed pilose hairs. *Inflorescences* axillary and terminal; peduncles slender, 0.5–4 cm long. *Capitula* radiate, ca 9 mm across after flowering; receptacle flattish, slightly convex, paleaceous, paleae linear, somewhat bristle-like, fragile, appressed-pubescent, central paleae sometimes lacking; *involucres* globose-campanulate, ca 5 mm high, ca 5 mm diam.; *phyllaries* in 2 series, outer phyllaries herbaceous or herbaceous-tipped, subequal, inner phyllaries narrower and shorter. *Ray-florets* numerous per capitulum in 2–3 series, female, fertile, rays white,

lanceolate, 2.5–3 mm long, 0.4 mm wide, apex bifid; basal tube 0.2–0.5 mm long; *disc-florets* ca 30 per capitulum, bisexual, fertile, corolla white, tubular, ca 1.5 mm long, apex mostly 4-toothed; basal tube 0.4 mm long. *Achenes* thick, 2–2.5(–2.8) mm long, rough, often triquetrous with 1 surface opposite a phyllary or quadrangular and somewhat compressed along radium of capitula; *pappus* crown nearly obsolete, distant from marginal or truncate achene. Chromosome no. 2n = 22.

Japan.— KYUSHU: Kagoshima [Amami-Ohshima, 6 May 1973, *Tsugaru* 266 (**TNS**); Tanegashima, 16 Sept. 1955, *Ohuchiyama* 48 (**TNS**)]. RYUKYU: Okinawa [Iriomote, 23 March 1973, *Koyama, Fukuoka & Kato* 174 (**TNS**); Ishigaki, 27 March 1973, *Koyama, Fukuoka & Kato* 314 (**TNS**); Izena, 24 March 1979, *Tamura, Okada &. Ueda* 26717 (**MBK**); Okinawa, 21 Aug. 1984, *Ito* 962 (**TNS**); Okinoerabu, 7 Aug. 1911, *Tashiro* s.n. (**TNS**); Yonaguni, 2 Oct. 1973, *Hatusima* et al. 317000 (**TNS**)].

Philippines.— LUZON: Laguna [Los Banos, 21 Feb. 1963, *Tateoka* 2085 (**TNS**)].

Singapore.— [21 Oct. 1881, *unknown collector* 5 (**TNS**)].

Indonesia.— SUMATRA: Benkoelen [Tjoeroep, 25 Aug. 1931, *Tokura* s.n. (**TNS**)]. KALIMANTAN TIMUR: [Samarinda, 21 Jan. 1979, *Murata, Kato & Mogea* B-2675 (**TNS**)].

Malaysia.— SARAWAK: Bintulu [4th Division, 4 Nov. 1963. *Hotta* 15661 (**TNS**)].

China.— HAINAN: Wanqiao [Wenchan Co., 15 July 1940, *Mori* s.n. (**TNS**); Haikou, 23 Aug. 1940, *M. Mori* s.n. (**TNS**)]. HONGKONG: [Kowloon, July 1937, *Takahashi* 68 (**TNS**)]. HUNAN: [26.4 N, 110.8 E, Xining Co., 19 July 1994, *Lin-bo* 39 (**TNS**)]. JIANGXI: Shahe [Jiujiang Co., 13 Oct. 1995, *Ce-ming* 95860 (**TNS**)]. KWEICHOW: [Bord des rivieres et endroits humides, *Esquirol* 3201 (**TNS**)]. YUNNAN: Jinghong [Xishuang-banna Dai Aut. Pr., 11 Aug. 1994, *Konta & Takahashi* 3490 (**TNS**); Pro Vicar Apostolic, Yunnan-sen Nov. 1906, *Maire* 974 (**TNS**)].

Taiwan.— ILAN [Jaoxi-xiang, Ilan to Jaoxi, 7 Apr. 1996, *Kawasaki* 2122 (**TNS**); Nan-shan, Piyanan, 26 July 1963, *Tamura & Shimizu* 20983 (**MBK**)]. KEELUNG: [Keelung, 27 June 1963, *Tamura, Shimizu & Kao* 20023 (**MBK**)]. TAIPEI: [Pinglin-xiang, Pinglin, 16 June 1998, *Kawasaki* 5351 (**TNS**)]. PENGHU: [Shanshui, 119°35’ 50"E; 23°30’ 82"N, 22 June 1994, *Chen & Hu* 700 (**TNS**); Tungpanyu, 119°31’02"E; 23°30’80"N, 23 June 1994, *Chen & Hu 734* (**TNS**)]. KAOHSIUNG: [Kizan Rokki, 18 July 1938, *Okamoto* s.n. (**TNS**)]. MIAOLI: [Tung-hsiao, Ping-ting, 2 Aug. 1964, *Tamura & Koyama* 23110 (**MBK**, **TNS**)]. TAITUNG: [Lutao, June 1926, *Sasaki* s.n. (**TNS**); 16 July 1924, *Sasaki* s.n. (**TNS**); Shou-lutao, 20 June 1926, *Sasaki* s.n. (**TNS**); Lanyu, 2 June 1929, *Sasaki* s.n. (**TNS**)].

Vietnam. —[Nguroi Giam Dinh, 30 June 2000, *unknown collector* s.n. (**TNS**)].

Thailand.— NORTHERN: Chiang Mai [Fang, 2 July 1978, *Phengklai, Tamura, Niyondham & Sangkachand* 4229 (**MBK**); Maerim to Samoeng Road, 24 June 1998, *Thongson* 34 (**MBK**); Chiang Mai, 3 July 1994, *W. Nanakorn et al.* 1119 (**MBK**)]; Lampang [Doi Pang La, T-10806 (**KYO**)]; Mae Hong Son [Huai Yuak, T-32444 (**KYO**)]; Phitsanulok [Phitsanulok to Bang Rakam, T-17242 (**KYO**)]. NORTHEASTERN: Loei [Phu Kradung, *Sangkhachang* 2041 (**BKF**, **KYO**)]; Nongkhai [Bungkan, T-31060 (**KYO**); Srichiengmai, T-31102 (**KYO**)]; Phetchabun [Nam Nao National Park, T-31766 (**KYO**)]. EASTERN: Nakhon Ratchasima [Khao Yai National Park, T-30068, T-30125, (**BKF**, **KYO**)]. CENTRAL: Krung

Figure 3. Type specimen of *Eclipta angustata* Umemoto et H. Koyama, sp. nov. Thailand, CENTRAL, Prov. Phra Nakhon: Bang Khen, north of Bangkok, 13 Nov. 1965, *Iwatsuki* T-254 (holotype in **KYO**, isotype in **BKF**, **TNS**).

Thep Maha Nakhon [Bangkok, 7-8 Aug. 1982, *Nuno* s.n. (**TNS**); Soi Somprasong, 31 Jan. 1966, *Fukuoka* T-7079 (**KYO**, **TNS**)]; Pathum Thani [Pathum Thani, T-17346 (**BKF**, **KYO**)]; Phra Nakhon Si Ayutthaya [Nong Khae, T-14770 (**BKF**, **KYO**)]; Samut Prakan [Ban Bang Pu Kao, 14 Aug. 1967, *Shimizu et al.* T-7549 (**BKF**, **KYO**, **TNS**)]; Saraburi [Phu Kae Botanic Garden, T-14800 (**KYO**), T-17882 (**BKF**, **KYO**); Saraburi, T-17828 (**BKF**, **KYO**); Tharn Pra Photisat, T-19405, T-19521 (**KYO**)]; Suphan Buri [U-thong Distr., 13 Jan. 1985, *Koyama et al.* T-49053 (**TNS**)]. SOUTHEASTERN: Prachin Buri: Khao Yai National Park, *Larsen & Smitinand* 396 (**AAU**, **BKF**, **KYO**); Chakan Arboretum, T-33129 (**KYO**)]. SOUTHWESTERN: Kanchanaburi [Sai Yok, 14°09'N 99°10'E, *van Beusekom et al.* 3930 (**BKF**, **C**, **KYO**, **MO**); Khao Kamphaeng, T-30534 (**KYO**)]; Prachuap Khiri Khan [Bang Saphan, T-7809 (**BKF**, **KYO**); Uthaithani: Huai Kha Kaeng Wildlife Sanctuary, 11 Nov. 1979, *Shimizu et al.* T-22220, T-22360 (**BKF**, **KYO**, **TNS**)]. PENINSULAR: Narathiwat [Sungai Kolok, 20 Dec. 1993, *Fukuoka & Koyama* T-61964 (**TNS**).

India.—Bengal [Dopada, 30 Feb. 1971, *Biwas* 4963 (**TNS**)].

Nepal.— [Stebus, 28 July 1953, *Nakao* s.n. (**TNS**)].

Distribution.— A tropical weed, sometimes used as a medicinal herb, hair dye and as a vegetable (Umemoto, personal observation), in Southeast Asia and northward into subtropical regions; Japan (Ryukyu), Taiwan, S China, SE Asia and N India.

Ecology.— Dried up rice fields, waste and moist places by streamlets and in pools, 0–1000 m alt.; flowering December to August, probably all the year round.

Notes: *Eclipta parviflora* Wall. ex DC. is similar to the present species in general appearance (viewed on Microfiche). Thai plants of this species are artificially easy to cross with Japanese plants of *E. thermalis* (Umemoto, unpublished data).

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