

Taxonomic Studies in the Compositae of Thailand 12.
Vernonia Shreb. sect. *Tephrodes* DC. and sect. *Cyanopsis* Bl.

Hiroshige Koyama

Department of Botany, National Science Museum,
Amakubo 4-1-1, Tsukuba-shi, Ibaraki, 305-0005 Japan

Abstract Sects. *Tephrodes* and *Cyanopsis* of *Vernonia* are taxonomically examined. For *Vernonia benguetensis* and *V. cinerea* var. *montana* of Sect. *Tephrodes*, this is the first record from Thailand. *Vernonia patula* of Sect. *Cyanopsis* has been found to be unvariable in our area, though three varieties of this species were enumerated in the Malay Archipelago.

Key words: Compositae, taxonomy, Thailand, *Vernonia* sects. *Tephrodes* and *Cyanopsis*.

In the present part of this series, Sects. *Tephrodes* and *Cyanopsis* are taxonomically examined and can be distinguished as follows.

1. Pappus hairs uni-seriate, caducous, white, 2–3 mm long; achenes 4–6 angular, glabrous, glandular dotted. Sect. *Cyanopsis*
2. Pappus hairs bi-seriate, persistent, the outer shorter than 0.3 mm, more or less squamiform; achenes not conspicuously angular, pubescent, glandular dotted.
..... Sect. *Tephrodes*

Sect. *Tephrodes* DC.

Eight species are enumerated in the Flora of Malay Archipelago (Koster, 1935) in this section, but in Thailand, following two species could be found. *Vernonia cinerea* (L.) Less. including var. *parviflora* (Reinw. ex DC.) Bl., has been recorded by several authors in Thailand, but for var. *montana* (C. B. Clarke) Koster, this is the first record from Thailand. *Vernonia benguetensis* Elm. was described as a species very similar to some forms of *V. cinerea*. As enumerated in the list of distribution of the species, I have seen some specimens collected from Luzon and Mindanao at the Herbarium, National Museum of Natural History, Paris in France. They are characterized by having leaves lanceolate and corollas longer than pappi. Some specimens collected from Phu Kradung can be considered to be identified as the same taxon by having narrow leaves and corollas longer than pappi.

Key to the species

1. Corollas of florets nearly the same as inner pappi in length at anthesis; lower leaves rhombic-ovate or ovate. *V. cinerea*
2. Corollas of florets much longer than inner pappi in length at anthesis; lower leaves linear-lanceolate or lanceolate. *V. benguetensis*

1. *Vernonia benguetensis* Elm.

Leaflet. Philip. Bot. **1**: 361 (1908), type not seen.

Erect perennial herb.; stems 45–55 cm tall, subglabrous, branched above. Leaves cauline; median leaves linear elliptic, ca. 3 cm long, ca. 0.8 cm wide, obtuse, base cuneate, subentire, a few mucronate-toothed, upper surface subglabrous, lower surface pubescent, especially on nerves, glandular dotted; upper leaves gradually smaller, narrower, linear. Heads discoid, ca. 10 mm across, loosely corymbose; involucre campanulate, 5–6 mm high, fulvously pubescent, glandular dotted; phyllaries in 5 series, outer phyllaries linear, ca. 2 mm long, acuminate, median and inner phyllaries linear-lanceolate, awn tipped. Flowers fewer than 20 per head, 5-lobed, bisexual, fertile; corollas ca. 6–7 mm long, violet. Achenes (unripe) densely short hispid, glandular dotted. Pappus of capillary bristles, fulvous whitie, in 2 series, inner bristles 4–5 mm long, outer bristles shorter, ca. 0.1 mm long.

Specimens examined. NE Loei: Phu Kradung (11–1958 Sorensen *et al.* 6182 C; 7–1959 Floto 7453 C; 1–1960 Abbe *et al.* 9470 A, L; 11–1970 Charoenphol *et al.* 4615 AAU).

Habitat: among grasses on grassy fields at the summit, alt. 1100–1300 m.

Distr.: Philippines (Luzon: 3–1913 Vanoverbergh 2761 P; Mindanao: 7–1910 Fenix 26037 P), Yunnan (Legendre 1841 P) and Thailand.

2. *Vernonia cinerea* (L.) Less.

in Linnaea **4**: 291 (1829); Kerr, Fl. Siam. Enum. **2** (3): 236 (1936); Kitam. in Acta Phytotax. Geobot. **24**: 14 (1969). —*Conyza cinerea* L., Sp. Pl.: 862 (1753), type not seen.

In Thailand, three varieties can be recognized as follows.

1. Involucre 2.5–3.5 mm high, flowers fewer than 20 per head. var. *parviflora*
1. Involucre 4–6 mm high, flowers ca. 20 or more per head.
 2. Stems fulvously villous. var. *montana*
 2. Stems gray pubescent. var. *cinerea*

As shown in Fig. 1, var. *montana* is confined to the mountainous areas, up to 1000–2000 m high and var. *parviflora* is found in rather human habitation than var. *cinerea*.

var. *cinerea*

Erect, annual or perennial herb, from tap roots; stems 40–100 cm tall, gray pu-

bescent, branched above. Leaves cauline; median leaves rhombic-ovate or ovate, 3.5–6.5 cm long, 1.3–3.0 cm wide, acute, base cuneate, mucronate-toothed or undulate-toothed, upper surface pubescent, lower surface soft grayish pubescent, especially on nerves, glandular dotted, petiole 10–25 mm long; upper leaves gradually smaller, narrower, broadly lanceolate to linear. Heads discoid, ca. 8–10 mm across, in corymbose panicles, rose-purple; peduncle 0.5–2.0 cm long; involucre campanulate, 4–5 mm high, pubescent, glandular dotted; phyllaries in 4 series, outer phyllaries linear, 1.5–2.0 mm long, acuminate, median and inner phyllaries linear-lanceolate, awn tipped. Flowers nearly year round; ca. 20 or more (ca. 23) per head, 5-lobed, bisexual, fertile; corollas 4.5–5.5 mm long, purple, violet or white. Achenes terete, ca. 2 mm long, densely short hispid, glandular dotted. Pappus of capillary bristles, whitish, in 2 series, inner bristles 4–5 mm long, outer bristles shorter, 0.25 mm long.

Specimens examined. **N** Chiang Mai: Doi Chiang Dao (9–1967 Tagawa *et al.* T-9795 KYO), Doi Suthep (6–1958 Sorensen *et al.* 3704 C), Fang (2–1958 Sorensen *et al.* 1783 C). Lampang: Tham Pha Thai to Huai Tak (9–1967 Tagawa *et al.* T-10630 BKF, KYO). Lamphun: Ban Khun Tan to Doi Khun Tan (9–1967 Tagawa *et al.* KYO), Doi Khun Tan (9–1967 Tagawa *et al.* T-9285 KYO). Phitsanulok: Thung Salaeng Luang National Park (10–1979 Shimizu *et al.* T-18338 BKF, KYO, T-188347 KYO). Phrae: Den Chai (10–1929 Franck 400 C). Tak: Larn Sarng National Park (8–1967 Tagawa *et al.* T-8547 KYO; 7–1973 Murata *et al.* T-16675 KYO, T-16634 BKF, KYO). **NE** Loei: Nam Thop to Ban Na Luang (12–1965 Tagawa *et al.* T-1963 A, BKF, KYO), Phu Kradung (8–1988 Koyama T-61317 KYO, 9–1988 Takahashi & Tamura T-60659 KYO, 9–1988 Koyama T-61504 KYO). Phetchabun: Nam Nao National Park (12–1982 Koyama *et al.* T-31743 TNS). Phitsanulok: Thung Salaeng National Park (12–1982 Koyama *et al.* T-31889 TNS). **E** Buri Ram: 40 km S of Buri Ram city (10–1984 Murata *et al.* T-37451 KYO). Nakhon Nayok: Khao Yai National Park (10–1984 Murata *et al.* T-52587 TNS). Nakon Ratchasima: Sakaerat (12–1983 Fukuoka & Ito T-34700 KYO). **SW** Kanchanaburi: Erawan fall (10–1971 Murata *et al.* T-16140 BKF, KYO), Ban Thasao (11–1979 Shimizu *et al.* T-21360 BKF, KYO), Salakphra Wildlife Sanctuary (11–1979 Shimizu *et al.* T-21238 BKF, KYO), Sai Yok (12–1961 Larsen 8776 C; 11–1979 Shimizu *et al.* T-21700, T-21716 BKF, KYO). Uthaitani: Huay Kha Kaeng Wildlife Sanctuary (11–1979 Shimizu *et al.* T-22224, T-22460 KYO). C Phra Nakhon S. A.: Ayutthaya (11–1979 Shimizu *et al.* T-26074 BKF, KYO). Nakhon Nayok: Khao Yai National Park (11–1979 Shimizu *et al.* T-19715 BKF, KYO), Nang Rong (11–1982 Koyama *et al.* T-30220 TNS). Saraburi: Tharn Phra Photisat (10–1979 Shimizu *et al.* T-19409 BKF, KYO, TNS). **SE** Chantaburi: Khao Sabap (2–1935 Seidenfaden 2732 C). Chon Buri: Khao Khieo Wildlife Sanctuary (11–1979 Shimizu *et al.* T-23255 BKF, KYO). Rayong: Khao Cha Mao National Park (11–1979 Shimizu *et al.* T-23495 KYO). Trat: Koh Chang (5–1929 Nielsen 740 C; 8–1973 Murata *et al.* T-17537 KYO). PEN Phuket: Khao Pataeo Wildlife Sanctuary (12–1979 Shimizu *et al.* T-27155 BKF, KYO, TNS). Ranong:

Khao Phota Luangkaeo (12–1979 Shimizu *et al.* T-27011 BKF, KYO). Surat Thani: Wat Sua Um (1–1935 Seidenfaden 2195 C). Trang: Ban Nam Phrai (12–1979 Shimizu *et al.* T-27576 BKF, KYO).

Habitat: on waysides or cultivated fields, up to 1500 m from sea level, but usually abundant in lowlands. In some places such as an open clayey slopes, we have found a narrow leaf form (Koyama T-61504) of this variety which is similar to var. *linifolia* (Bl.) Koster.

Distr.: tropical and subtropical regions of Eastern Asia, Southeast Asia, Malaysia, Indonesia and Pacific Islands.

var. **montana** (C. B. Clarke) Koster

in Blumea **1**: 416 (1935), in Nova Guinea Bot. (24): 511 (1966). —*V. cinerea* β . *montana* C. B. Clarke, Comp. Ind.: 21 (1876), type from Khasia hill, Assam, not seen.

Branches fulvously villous, mixed with crisped, appressed hairs. Leaves sharply mucronately serrate, recurved at the margin, coriaceous, upper surface scabrid and villous, lower surface densely fulvously villous, glandular dotted. Involucre broadly campanulate, 5–6 mm high, phyllaries densely fulvously villous, 5–6 mm long, very long pointed at the top. Pappus somewhat fulvous.

Specimens examined. **N** Chiang Mai: Doi Chang (10–1979 Shimizu *et al.* T-20358 KYO, T-20676 BKF, KYO), Doi Chiang Dao (12–1948 Suvarnakoset 1012 TNS; 12–1955 Ploenchit 970 US), Doi Inthanon (Garrett 922 BKF; 10–1971 Murata *et al.* T-15635, T-15810 KYO), Doi Suthep (6–1958 Sorensen *et al.* 3736 C; 1–1959 Sorensen *et al.* 6588 BKF, C; 12–1965 Iwatsuki & Fukuoka T-3230 BKF, KYO; 10–1979 Shimizu *et al.* T-18709 KYO), Bo Luang tableland (1–1964 Hansen *et al.* 11001 BKF, C; 10–1979 Shimizu *et al.* T-19248 BKF, KYO), Ban Mae Kon (1–1962 Matsuoka OCKUBE 123 KYO), Ban Ang Ka Noi (6–1979 Vidal *et al.* 6291 P), Mae Tamang (11–1984 Koyama *et al.* T-39661 TNS). Chiang Rai: Mae Sai (1–1962 Matsuoka OCKUBE 165 KYO). Nan: Pha Sing (12–1957 Walker 7942 TNS). **NE** Loei: Phu Kradung (7–1959 Floto 7751 C; 11–1979 Shimizu *et al.* T-22561, T-22807 KYO, T-22617 BKF, KYO; 12–1982 Koyama *et al.* T-31213 TNS; 9–1988 Takahashi & Tamura T-63331 KYO). **E** Nakhon Ratchasima: Khao Yai National Park (7–1973 Murata *et al.* T-16440 KYO). **SW** Kanchanaburi: Ban Khao Kaeng Khaep (11–1979 Shimizu *et al.* T-21450 KYO), Erawan National Park (11–1979 Shimizu *et al.* T-21633 KYO), Huai Bankan (1971/72 Beusekom *et al.* 3508 BKF, C, KYO, P), Tham Than Lot National Park (11–1979 Shimizu *et al.* T-22169 KYO, T-22031 BKF, KYO), Thong Pha Phum (1–1985 Koyama *et al.* T-48941 KYO).

Habitat: on mountain slopes of waysides or old clearings in evergreen forests at the higher elevation, alt. 1000–2000 m.

Distr.: Assam (type locality), Tonkin (12–1937 M. Poilane 26955 P), Laos (12–1917 M. Chevalier 37120 P, 4–1932 M. Poilane 20628 P), Thailand, Annan (9/11–

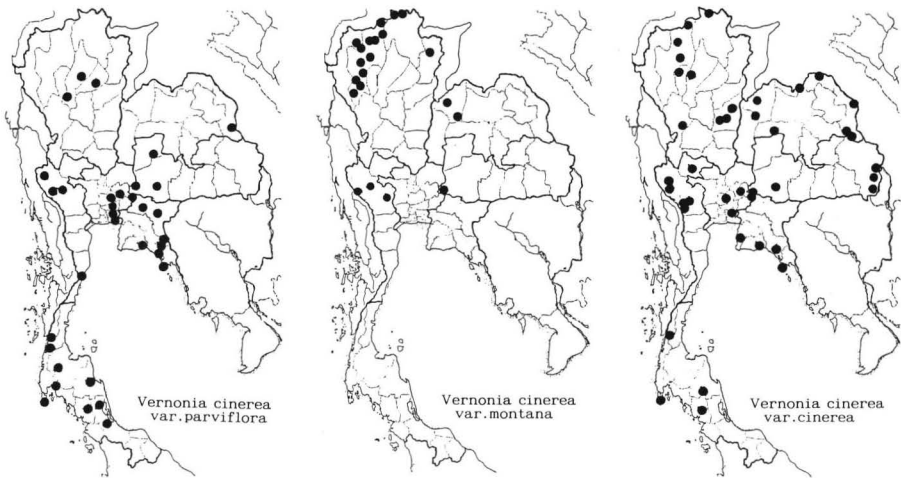


Fig. 1. Ranges of the infraspecific taxa of *Vernonia cinerea* in Thailand. Black spots are marked with the station of specimens examined in this studies.

1929 M. Lichy 43 P) and Sumatra (Koster, 1935).

var. **parviflora** (Reinw. et Blume) DC.

Prodr. **5**: 24 (1836); Kitam. in Acta Phytotax. Geobot. **24**: 414 (1969). —*V. parviflora* Reinw. in Blume, Flora van Nederl. Ind.: 893 (1826), type not seen.

Median leaves elliptic-ovate or broadly ovate to nearly circular, upper surface pubescent, lower surface sparingly pubescent. Heads 5–7 mm across, in loose corymbose panicles; flowers fewer than 20 (ca. 18) per head; involucre campanulate, 2.5–3.5 mm high. Achenes 1.0–1.5 mm long; pappus whitish, 2.5–3.0 mm long; corolla 2.5–3.0 mm long.

Specimens examined. **N** Chiang Mai: Doi Suthep (8–1988 Tamura *et al.* T-60669 KYO). Lampang: Mae Thak (3–1958 Sorensen *et al.* 1848 BKF, C), 50 km S of Thoen (10–1979 Shimizu *et al.* T-18546 KYO). Phrae: Phrae (10–1929 Franck 400 C). **SW** Prachuap Khiri Khan: Sam Roi Yot National Park (12–1979 Shimizu *et al.* T-26093 KYO). **C** Nakhon Nayok: Khao Yai National Park (10–1979 Shimizu *et al.* T-19720 KYO). Pathum Thani: Pathum Thani (7–1973 Murata & Fukuoka T-17330 BKF, KYO). Krung Thep M. N.: Bangkok (1899 Zimmermann 7 MO, S), Bang Khen (11–1965 Iwatsuki T-246 BKF, KYO). Phra Nakhon S. A.: Nongkhae (8–1971 Murata *et al.* T-14764 BKF, KYO). Samut Prakan: Ban Bang Pu Kao (8–1967 Shimizu *et al.* T-7550 BKF, KYO, TNS). Saraburi: Phukae Botanic Garden (10–1979 Shimizu *et al.* T-17875 KYO), Muak Lek (8–1982 Shimizu *et al.* T-28361 KYO), 7 km S of Saraburi (8–1988 Koyama T-61275 KYO). **SE** Chanthaburi: Chantaboon (Vesterdal 11-D C), Khao Soidao (2–1966 Iwatsuki *et al.* T-7313 KYO), Khitchakut National Park (11–1979 Shimizu *et al.* T-23946 KYO). Rayong: Khao Cha Mao National Park

(11–1979 Shimizu *et al.* T-23453 BKF, KYO, TNS). Trat: Koh Chang (7–1955 Sangkhachand 484 BKF, TNS; 8–1973 Murata *et al.* T-17537 TNS). **PEN** Krabi: Than Bokhorani Arboretum (12–1979 Shimizu *et al.* T-27412 KYO). Pha-tthalung: Ban Phot (12–1979 Shimizu *et al.* T-27755 KYO), Khao Khao (1–1958 Sorensen *et al.* 709 C). Phuket: Nai Han beach (12–1979 Shimizu *et al.* T-27296 KYO, TNS). Ranong: Hot Spring Park (12–1979 Shimizu *et al.* T-26228 BKF, KYO, T-26236 KYO), Ban Kam Phuran (12–1979 Shimizu *et al.* T-26331 KYO). Songkhla: Boriphath fall (12–1979 Shimizu *et al.* T-27630, T-27668 BKF, KYO). Surat Thani: Aerodrome Road (Seidenfaden 2067, 2387 C), Khao Sok National Park (12–1979 Shimizu *et al.* T-27122 BKF, KYO). Trang: Khao Chong Botanic Garden (12–1979 Shimizu *et al.* T-27497 KYO).

Habitat: on sunny slopes of roadsides, old clearings, cultivated fields and of grassy fields in dry dipterocarp forests, alt. 80–1000 m.

Distr.: nearly the same area as that of var. *cinerea*. In Japan, however, the occurrence of this variety is limited in Yaeyama-gunto of the Ryukyu and in Chichi-jima of the Bonin Islands, though var. *cinerea* spreads northward Kagoshima Prefecture, Kyushu.

Sect. *Cyanopus* Bl.

Although about five species are known from Asia and Africa, there is no revision of this section. In Thailand, there is only one species which has been found to be unvariable, though it seems to be more or less variable in the Malay Archipelago (Koster, 1935).

1. *Vernonia patula* (Dryand) Merr.

in Philip. Journ. Sc. Bot. **3**: 439 (1908); Kerr, Fl. Siam. Enum. **2**(3): 241 (1936). — *Conyza patula* Dryand. in Ait., Hort. Kew. **3**: 184 (1789), type not seen.

Erect, annual or biennial herb, from tap roots; stems 20–90 cm tall, terete, ribbed, sparsely pubescent, sometimes purplish, branched at the base. Leaves cauline; median leaves broadly ovate, ovate-elliptic, nearly circular or elliptic, 2.5–10.5 cm long, 1.0–4.5 cm wide, acute or obtuse, base suddenly attenuate into petiole, mucronately serrate, repandate or subentire, upper surface subglabrous or slightly pubescent, lower surface greyish silky villous or felty tomentose, glandular dotted; petiole 3–20 mm long; upper leaves gradually smaller, narrower, broadly lanceolate. Heads discoid, ca. 12 mm across, in the dichotomous branches, pale purple or purple; peduncle 1.0–4.5 cm long; involucre campanulate or subglobular, ca. 6 mm high, sparsely greyish villous, more or less glandular dotted; phyllaries in 4 series, outer phyllaries subulate, ca. 3 mm long, terminating into a prickle, median phyllaries linear, inner phyllaries oblong-lanceolate or lanceolate, mucronate tipped. Flowers July to January; ca. 90 or more per head, 5-lobed, bisexual, fertile, purple, violet or white.

Achenes 4-6-angular, ca. 1.8 mm long, glabrous, glandular dotted. Pappus of capillary bristles, ca. 3.0 mm long, whitish, uniseriate, caducous.

Specimens examined. **N** Sukhothai: Yahng-N (Maxwell 71-643 BK). **NE** Mukdahan: Ban Wan (6-1932 Lakshnakara 948 BK). E Buri Ram: Buri Ram (Phengkklai *et al.* 3392 BKF). Nakhawn Sawan: Paknampo (Vanpruk 1015 BKF). **SW** Prachinburi: Chakan Arboretum (1-1983 Koyama *et al.* T-33138 KYO, TNS, T-33133 KYO). **C** Krung Thep M. N.: Bangkok (1859 Schomburgk 156 P). Samut Prakan: Bahng Gra Jow (Maxwell 70-19 BK). **PEN** Surat Thani: Kisiras Nikom (Sutheesorn 1875 BK).

Habitat: on dry rocky hills in limestone area and on open grassy slopes or on banks along river, alt. 50-150 m.

Distr.: Tenasserium & Andamans (Helfer 3108 P), Kwangtung (Tsui 631 SING), Fukien (Lin 6154 SING), Taiwan (10-1921 Ito 84473 TNS; 11-1926 Sasaki 420206 TNS; 8-1927 S. Suzuki TNS; 9-1919 Kudo & Sasaki 15259 TNS), Hainan (7-1940 S. Mori TNS; 7-1981 Yamazaki 2676 TNS; Fung 20219 SING), Tonkin (12-1913 Chevalier 29536 P; 12-1918 Chevalier 39514 P; 1-1938 M. Poilane 110, 27166 P), Annam (7-1923 M. Poilane 6995 P, 5-1924 M. Poilane 10639 P; 1919 Chevalier 39874 P; Pierre 1023 BKF), Thailand, Singapore (Burkill 1146 BKF), Sumatra (Koster, 1935), Celebes (5-1929 Kjellberg 4072 S), Philippines (1-1914 Merrill 235 TNS; Elmer 14493 S; Ramos & Edano 47233 S) and Java (8-1973 Murata *et al.* J-1303, J-1409 TNS; Zollinger 6 S).

Although this species is noted by Koster (1935) to be distributed in Japan, this species does not occur in Japan. Three varieties are distinguished by Koster (1935) for the plants of Malay Archipelago, but in Thailand and adjacent countries, special extreme forms can not be found at all.

Reference

- Koster, J. Th., 1935. The Compositae of the Malay Archipelago. I. Vernoniae and Eupatorieae. *Blumea*, **1**(3): 351-536.

