

Taxonomic Study of the Genus *Eurya* from the Ryukyu Archipelago

Sumihiko HATUSIMA

(Laboratory of Silviculture)

The Ryukyu Archipelago (also known as Loochoo) stretching between the main land of Kyusyu (Japan) and Formosa is rich in the species of *Eurya* and about a dozen species have been recorded by various authors. But, according to my examination of the abundant specimens preserved in the herbarium of the Kagoshima University and my series of observations in the field seven species of *Eurya* occur in the Ryukyus of which one is new. Of seven species *E. yakushimensis*, *E. zigzag*, *E. sakishimensis*, *E. osimensis* and *E. yaeyamensis* are endemic to the Ryukyus. All the specimens enumerated in this paper are preserved in the herbarium of the Department of Agriculture, Kagoshima University.

Key to the species, variety and form.

- A. Flowers sessile, branchlets densely pubescent, leaves oblong to oblong-lanceolate, rarely elliptic-lanceolate, subsessile, serrulate (5-6 teeth per 1 cm. long), anthers crenulate on the margins.
 - B. Fruits glabrous *E. osimensis*
 - B. Fruits silky *E. osimensis* var. *Kanehirae*
- A. Flowers distinctly pedicellate, leaves not subsessile, anthers entire on the margins.
 - B. Branchlets prominently winged and more or less zigzag, 2-2.5 mm. thick, glabrous.
 - C. Leaves oblong to oblong-elliptical, coriaceous, minute serrulate, 7-11 cm. long and 2.5-3.5 cm. broad, terminal buds up to 1.5 cm. long, glabrous, fruits ovoideous about 7 mm. long..... *E. yaeyamensis*
 - C. Leaves oblong-elliptical, thick and coriaceous, serrulate, 4-7 cm. long and 1.5-2.7 cm. broad, fruits globose smaller..... *E. zigzag*
 - B. Branchlets not winged and scarcely zigzag, usually less than 2 mm. thick.
 - C. Branchlets light brown or grayish light brown when dried, more or less pubescent rarely glabrous, terminal buds about 2-3 mm. long, leaves obovate to oblanceolate obtuse to slightly emarginate rarely acutish, brownish when dried, usually less than 5 cm. long *E. emarginata*
 - C. Branchlets differs in its colour, terminal buds about 3-6 mm. long. leaves usually acute to shortly acuminate.
 - D. Branchlets of the first year more or less keeled, glabrous rarely pilose, greenish in colour when dried.
 - E. Branchlets slender \pm 1 mm. thick glabrous, leaves more or less falcately

- oblanceolate 15–3.5 cm. long and less than 1 cm. broad, flower buds about 1.5 mm. in diameter *E. yakushimensis*
- E. Branchlets thicker, leaves larger and scarcely falcate, flower buds larger.
- F. Branchlets, buds and leaves glabrous *E. japonica*
- F. Upper parts of branchlets, buds, and occasionally lower parts of the mid-ribs of the undersurface of leaves more or less pilose... *E. japonica* f. *australis*
- D. Branchlets of the first year scarcely keeled, pilose to pubescent, not greenish when dried *E. sakishimensis*

Eurya osimensis Masamune in Trans. Nat. Hist. Formos. **25** (1935) 249; Hara, Enum. Spermatophyt. Jap. **3** (1954) 168; Masamune, Enum. Tracheophyt. Ryukyu Insl. **6** (1955) 13.

'*Eurya strigillosa* Hay.': Masamune, l. c. (1955) 13, p. p.

Hab. Isl. Amami-oshima: Asado, S. Kawagoe, July 1919; Shinokawa, S. Kawagoe, Aug. 1910; without precise locality, T. Naito, Jan. 1938; Koniya Pass, alt. 300 m., S. Hatusima 20115; between Yuwan and Shinmura, H. Noguchi 3520; Nozigawa-Yuwan, R. Kanehira 3392; near the summit of Mt. Yuwandake, alt. 650 m., a frequent tree 5 m. ht., S. Hatusima & Sako 21807. Isl. Tokunoshima: Mt. Amagidake, alt. 500 m., S. Hatusima 19227; in the forest on the watershed between Boma and Nishinakama, alt. 300 m., S. Hatusima 19356. Isl. Okinawa: Mt. Onna, M. Ishiwaru.

Distr. Endemic. var. ***Kanehirae*** (Hatusima) Hatusima, **comb. et. stat. nov.**

Eurya Kanehirae Hatusima in Journ. Jap. Bot. **15** (1939) 134, f. II, 3; Walker et al., Fl. Okinawa (1952) 103; Walker, Imp. Trees Ryukyus (1954) 220, f. 135; Masamune, l. c. (1955) 13, **syn. nov.**

? '*Eurya symplocina* Bl.': Sakaguchi, Gen. Ind. Fl. Okinawa (1924) 38

'*Eurya strigillosa* Hay.': Masamune, l. c. (1955) 13, pro maj. part.

Hab. Isl. Okinawa: Mt. Genka, T. Amano 6969; Mt. Uisiga, S. Nakamine; Mt. Taniyu, T. Naito; Beki, T. Naito. Isl. Ishigaki: Mt. Omoto, S. Kawagoe, E. Takamine 2017. Isl. Iriomote: Hatomamori, alt. 200 m., a rare tree 10 m. ht., S. Hatusima 23081, Nov. 1958; along the River Nakara, S. Murayama.

Distr. Endemic.

G. Masamune admits the occurrence of *E. strigillosa* Hay. from Formosa in the Ryukyus, but its occurrence there is very doubtful. Very likely above variety has been erroneously determined as *E. strigillosa* Hay. *E. strigillosa* Hay. undoubtedly very closely resembles *E. osimensis* var. *Kanehirae* Hatusima, but differs by its sessile leaves with smaller serration.

Eurya yaeyamensis Masamune in Trans. Nat. Hist. Soc. Formos, **24**(1934) 20; Enum. Tracheophyt. Ryukyu Insl. **6** (1955) 13, f. 5; Walker et al., Fl. Okinawa (1952) 103; Hatusima & Amano, Fl. Okinawa (1958) 68.

Hab. Isl. Iriomote: Nakama, S. Murayama; in the fringing forest of the Urauchi River. alt. 3 m., a slender shrub 3 m. ht., common, S. Hatusima 18641, 18574, 19640. Isl. Ishigaki: Mt. Omoto, alt. 100–400 m., a shrub 3–4 m. ht., S. Hatusima 18974, 19002, 22935, T. Amano 7360, S. Kawagoe; Mt. Buzama, E. Takamine 2454.

Distr. Endemic.

Eurya zigzag Masamune in Journ. Trop. Agric. Formos. 2 (1930) 48 et 1. c. (1955) 13; Walker et al., 1. c. 103; Hatusima & Amano, 1. c. 68.

Hab, Isl. Okinawa: Mt. Onna T. Naito, S. Hatusima 17730, May 8, 1955; Mt. Aha, T. Amano 7470; Oku, Kunigami-son, T. Amano 7197.

Distr. Endemic.

Eurya emarginata (Thunb.) Makino in Bot. Mag. Tokyo 18 (1904) 19; Kobuski in Ann. Miss. Bot. Gard. 25 (1938) 316; Keng in Taiwania 1 (1950) 263; Walker et al., 1. c. 102; Ohwi, Fl. Jap. (1953) 777; Hara, Enum. Spermatophyt. Jap. 3 (1954) 167; Masamune, 1. c. (1955) 12; Hatusima & Amano, 1. c. 68.

'*Eurya chinensis* R. Br.': Ito et Matumura, Tent. Fl. Lutch. (1899) 326.

'*Eurya japonica* var. *nitida* Thiselt.': Ito et Matumura, 1. c. 326; Walker et al., 1. c. 102.

'*Eurya yakushimensis* Mak.': Sakaguchi, Gen. Ind. Fl. Okinawa (1924) 38.

Eurya emarginata var. *glaberrima* Hatusima in Journ. Jap. Bot. 15 (1939) 135; Hatusima & Amano, 1. c. 68 (ut var. *glabra*), **syn. nov.**

Eurya ryukyuensis Masamune in Trans. Nat. Hist. Soc. Formos. 25 (1935) 249; Walker et al. 1. c. 102; Hatusima & Amano, 1. c. 68, **syn. nov.**

Eurya minutissima Hatusima in Journ. Jap. Bot. 15 (1939) 135, t. 2, 2; walker et al., 1. c. 103; Hara, 1. c. 168; Masamune, 1. c. (1955) 13; Hatusima & Amano, 1. c. 68, **syn. nov.**

Hab. *E. ryukyuensis* type: Isl. Iriomote: a common shrub on edge of fringing forest along the Urauchi River, alt. 3-100 m., S. Hatusima 18502, 18503, 18639, 18512, 18605A, T. Amano 7173; Nakama, Murayama, Oct. 1921. Littoral form of *E. ryukyuensis*: Isl. Iriomote: Hoshitate, alt. 2 m., S. Hatusima 18804, 18814; Hunauki, alt. 2 m., S. Hatusima 23169, 23168; Shirahama, S. Hatusima 18747; Motonariya, S. Kawagoe; without precise locality, S. Kawagoe. Isl. Ishigaki: Nagura, alt. 5 m., S. Hatusima 19043, 18989; Mt. Omoto, alt. 50 m., S. Hatusima 18978. Isl. Yonakuni, S. Hatusima 24556-24561. Isl. Uoturi, Senkaku Islands, S. Tawada. Isl. Tokunoshima: Mt. Amagidake, alt. 100 m., S. Hatusima 19191. *E. minutissima* type: Isl. Okinawa: Mt. Yonahadake, alt. 400 m., S. Hatusima 18409, 18419; Mt. Yona, alt. 350 m., S. Hatusima 18300, 18291; Mt. Aha, alt. 300 m., S. Hatusima 18335; Sade, Kunigami, Z. Tashiro, Jan. 1, 1924 (type of *E. minutissima*). Isl. Tokunoshima: Mt. Inokawadake, alt. 550 m., S. Hatusima 19254, S. Yamanoka 18265; Mt. Amagidake, alt. 400 m., S. Hatusima 19136, 19206. Isl. Amami-oshima: Mt. Yuwandake, alt. 500-630 m., S. Hatusima 18335, 21810; Kawauchi, S. Kawagoe; Kinsakubaru, alt. 200 m., S. Hatusima 20180; without precise locality, Z. Tashiro. *E. emarginata* var. *glaberrima* type: Isl. Okinawa: Mt. Genka, T. Amano 6971; Kunigami, Z. Tashiro, Jan. 1, 1924 (type of *E. emarginata* var. *glaberrima*). Typical from: Isl. Okinawa: Mt. Aha, alt. 50 m., S. Hatusima 18314, 18283; Mt. Taniyu, alt. 100 m., S. Hatusima 18005, 18007; Mt. Nakaoji, Hanejimura, T. Amano 7585; Mt. Yonahadake, alt. 200 m., S. Hatusima 18384; 18386; Yona, Nakamine. Isl. Iwo-Torishima (off the west coast of Isl. Tokunoshima), S. Hatusima 17763. Isl. Amami-oshima: without precise locality, T. Naito; Naon, Yamatomura, alt. 50 m., S. Hatusima 19533; Akakina, Kasari-mura, S. Sako: Ashiken, Uken-mura,

alt. 10 m., H. Noguchi 3261, 3208; Ichi, Nishinakama-mura, alt. 20 m., S. Hatusima 19929; Kominato, alt. 5 m., S. Hatusima & S. Sako 23430. Isl. Kikai, S. Hatusima & S. Sako 23749. Isl. Tokunoshima: Boma, alt. 100 m., S. Hatusima 19375; Mt. Amagi, alt. 100 m., S. Hatusima 19180. Isl. Tanegashima: Kumano, S. Hatusima 12509. Intermediate form between a small leaved form of *E. japonica* and *E. emarginata*: Isl. Okierabu: Mt. Ohyama, alt. 150 m., S. Hatusima 21563, 21561, 21562. Isl. Okinawa: Aha, Kunigami-gun, alt. 50 m., S. Hatusima 18321; Mt. Taniyu, alt. 100 m., S. Hatusima 18000, 18001, 18002, 18007; Izumi, S. Hatusima 17982; Urazoe, Shimaziri, alt. 100 m., S. Hatusima 17394.

Distr. S. Japan, S. Korea, Formosa and China ?

In the Ryukyu Islands this is very variable in its pubescence of branchlets and leaves as well as in its size and form of leaves according to the habitat where they grow. *E. ryukyensis* Masamune from Isl. Iriomote is nothing but a form of this species growing on the mountain stream banks which has glabrescent branchlets and narrower glabrescent leaves, and this form gradually transfers to the typical broad leaved form as they descend the stream to the littoral zone. However, the littoral form of this species from the Yaeyama Islands is somewhat differs from the form from the other islands of the Ryukyus in its glabrescent branchlets and leaves though there are no other differences in their essential characters. On the other hand, *E. minutissima* Hatusima is a mountain form characterized by its slender softly pubescent branchlets and smaller leaves, and restricted chiefly to the mist belt zone of the islands of Okinawa, Tokunoshima and Amami-oshima, but even this form gradually transfers to the normal form as they descend the mountain and approach to the littoral zone. *E. emarginata* var. *glaberrima* Hatusima is nothing but an extreme glabrous form of this mountain form. Moreover, there is a series of forms of this species which stands between a small leaved form of *E. japonica* and *E. emarginata*. But, I am not sure now whether these intermediate forms owe their origin to the hybridization between the above two species.

Eurya yakushimensis Makino in Bot. Mag. Tokyo 27 (1913) 72; Masamune, Geobot. Stud. Yakushima (1934) 302; Enum. Tracheophyt. Ryukyu Insl. 6 (1955) 13; Hara, 1, c. 168.

Eurya japonica var. *yakushimensis* Mak. in Bot. Mag. Tokyo 24 (1910) 20; Ohwi, Fl. Jap. (1953) 777.

Hab. Isl. Yakushima: Mt. Miyanouradake, alt. 1500 m., common, S. Hatusima 14612 A, 14623; without precise locality, T. Naito.

This is well characterized by its small falcately oblanceolate leaves and restricted to the high mountain zone of Isl. Yakushima.

Distr. Endemic.

Eurya japonica Thunb., Fl. Jap. (1784) 191, t. 25; Rehd., Man. Cult. Trees and Shrubs ed. 2 (1940) 636 et Bibliogr. (1949) 462; Ohwi, 1, c. 777; Hara, 1, c. 166; Hatusima & Amano, 1, c. 68.

Eurya japonica var. *montana* Bl. in Ann. Mus. Lugd. Bat. 2 (1852) 106; Walker et al., 1, c. 102.

Eurya japonica var. *multiflora* Miq. in Ann. Mus. Lugd. Bat. 3 (1867) 14.

'*Eurya japonica* var. *nitida* Thiselt.': Walker et al., 1. c. 102 ?

'*Eurya japonica* var. *acuminata* Bl.': Walker et al., 1. c. 102 ?

Eurya japonica var. *angustifolia* Koidz. in Act. Phytotax. et Geobot 1 (1932) 20, syn. nov.

Eurya japonica var. *japonica* f. *angustifolia* (Koidz.) Hara, 1. c. 167; Masamune, 1 c. 13.

Hab. Isl. Ishigaki: Mt. Omoto, alt. 100 m., rare, S. Hatusima 18996, 22960. Isl. Okinawa: Mt. Onna, S. Hatusima 17749, 17838, 17395, 17801, S. Nakamine; Urazoe, alt. 50 m., S. Hatusima 17385, 17385; Shuri, alt. 50 m. S. Hatusima 17340, Y. Niuro; Aha, Ohgimi-son, S. Hatusima 18334, 18297; Kisenbaru, Onnamura, T. Amano 2026; Mt. Genka, T. Amano 6967, 6968; Mt. Yonaha, T. Amano 7127; Mt. Nuuha, Ohgimi-son, T. Amano 7497, S. Nakamine. Isl. Kume: Gushikawa-mura, T. Amano 7070, 7094. Isl. Okierabu: Mt. Ohyama, S. Hatusima & S. Sako 21577, T. Tojyo. Isl. Tokunoshima: Mt. Inokawadake, alt. 400 m., S. Hatusima 19341. Isl. Amami-ohima: Mt. Yuwandake, alt. 300 m., H. Noguchi 3318; Kasarimura, S. Sako; Nase, H. Ohno; Isl. Ukeshima, K. Uyehara. Tokara. Islands: Isl. Gwaja, S. Sako & K. Kawanabe 2349; Isl. Nakanoshima, S. Hatusima 15773; Isl. Kuchino-shima, alt. 580 m, S. Hatusima 16066, 16065, 16074, 16099; Isl. Kuroshima, S. Sako & K. Kawanabe 628, S. Hatusima 13482, 13466; Isl. Iwo, S. Hatusima 13494.

Distr. Japan to Formosa and China.

f. *australis* (Hats.) Hatusima, stat. nov.

Eurya japonica var. *australis* Hatusima in Jour. Jap. Bot 26 (1951) 374; Masamune, 1. c. (1955) 13.

Eurya pubicalyx Ohwi, Fl. Jap. (1953) 777, sine desc. lat.; in Bull. Sci. Mus. Tokyo 33 (1953) 79; Hara, 1. c. 168, syn. nov.

Hab. Isl. Yakushima: between Isso and Miyanoura, S. Hatusima 13543, 13574; between Ambo and Kosugidani, alt. 500 m., S. Hatusima 13591, 13574. Isl. Tanegashima: Huruta, S. Hatusima 15602; Suno, S. Ouchiyama 53. Isl. Okierabu: Mt. Koshiyama, K. Uyehara.

Distr. S. Kyusyu.

When describing *E. pubicalyx* Ohwi he emphasized the difference of the reticulation on the seed surface of this species, but I failed to detect such difference.

Eurya sakishimensis Hatusima, sp. nov., Fig. 1.

Arbor parva 4-5 m. alta, ramuli juniores cinereo-fuscescentes \pm pubescentes, 1-1.5 mm. crassi irregulariter striati. Folia alterna rhombo-oblonga vel oblongo-elliptica vel ovato-lanceolata tenuiter coriacea, apice acuminata ad summum obtusa, basi acuta, margine crenulato-serrulata (serrulis a se 2.5-3 mm. remotis), supra glabra nitida, subtus opaca glabra costa pilosa excepta, nervis lateralibus tenuis obsoletis. Petiolis circ. 3 mm. longis pilosis. Flores dioeci. Flores δ ad axillas foliorum solitariis vel binis pedicellatis, pedicellis circ. 2 mm. longis pilosis, tepala 4-6 imbricata inaequalia, 1-1.5 mm. longa, apice obtusa, exteriora dorso pilosa, stylo circ. 1 mm. longo apice 3-fido. Ovarium ovoideum circ. 1 mm. longum glabrum. Fructus ovoideus circ. 3 mm. longus, semina circ. 15 circ. 1.3 mm. longa minute reticulata.

Hab. Isl. Ishigaki: Mt. Omoto, alt. 50 m., S. Hatusima 18967 (fruiting type), 19016, 19046, 19026, 18896, 19041, 19000, 18954, 18607, 18716, 18977, T. Takamine 2006, Y. Niuro,

S. Kawagoe, Aug. 1919; without precise locality, Y. Ohno (flowering type), Feb. 15, 1957. Isl. Iriomote: In the thicket along the middle stream of the Urauchi River, alt. 50 m., S. Hatusima 18607; along the Nakara River, alt. 100 m., S. Hatusima 18716, 18781, 18716; without precise locality, Murayama, Sept. 1920.

This is most closely related to *E. japonica f. australis* Hatusima, but differs from it in having terete not keeled and densely pubescent branchlets bearing rhombic oblong leaves.

Doubtful and excluded species.

Eurya acuminata DC. in Mem. Soc. Phys. Gen. 1 (1822) 418; Hara, Enum. Spermatophy. Jap. 3 (1954) 166; Masamune, Enum. Tracheophyt. Ryukyu Insl. 6 (1955) 13.

H. Hara and G. Masamune admit the occurrence of this species in Japan proper and the Ryukyus, but I could see no specimens of this species from the Ryukyus or Japan proper though it occurs in Formosa, and it seems very doubtful if true *E. acuminata* occurs in the above districts.

Eurya acuminata var. *multiflora* (DC.) Bl. in Mus. Bot. Lugd. Batav. 2 (1854) 117; Masamune, 1. c. (1955) 12.

G. Masamune admits the occurrence of this variety in the Ryukyus, but it seems very doubtful.

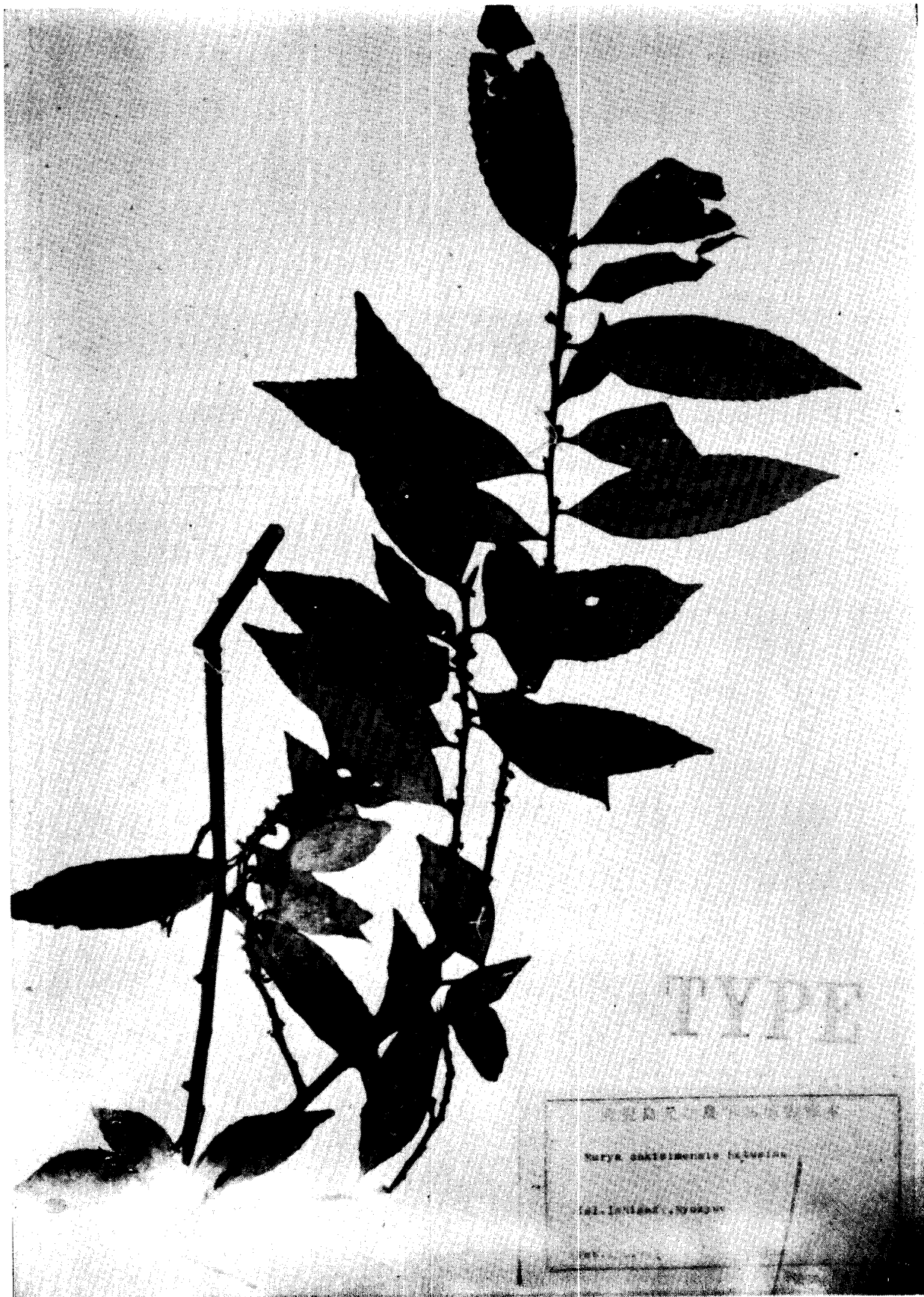


Fig. 1. *Eurya sakishimensis* Hatusima, type.