

Hiroyoshi OHASHI* & Yoichi TATEISHI*: *Mucuna macrocarpa*
and *M. gigantea* (Leguminosae) in Japan and Formosa**

大橋広好*・立石庸一*: ウジルカンダとワニグチモダマ**

1) *Mucuna macrocarpa* Wall.

Mucuna irukanda Ohwi was characterized by Ohwi (1936) by comparing with *M. Tashiroi* Hayata which is considered to be a subspecies of *M. gigantea* DC. in the present paper. According to the original description, *M. irukanda* has "leguminibus ca. 20 cm longis 3 cm latis brevissime pilosulis, utrinque latere angulatis non alatis ca. 5-spermis". This description, though only a little in part, indicates clearly that the species is different from *M. gigantea* and very similar to *M. macrocarpa* Wall.

In 1965 a variety of *M. irukanda*, var. *bungoensis* Ohwi, was distinguished from the typical form by the appressed hairs on the beneath of leaflets. Recently, however, Ohwi (1975) treated *M. irukanda* and its var. *bungoensis* as varieties of *M. ferruginea* Matsumura of Formosa, respectively, i. e. *M. ferruginea* var. *irukanda* (Ohwi) Ohwi and *M. ferruginea* var. *bungoensis* (Ohwi) Ohwi. *M. ferruginea* was diagnosed by Matsumura as "*M. macrocarpa* Wall. affinis videtur, sed ramulis foliis leguminibusque ferrugineo-tomentosis foliolis obtusis satis differt", but has usually been considered as a synonym of *M. macrocarpa* (e. g. Hosokawa 1932, Li 1963) or occasionally as a distinct species (Liu 1960).

While examining on the Himalayan species of *Mucuna*, we were aware that *M. macrocarpa*, *M. ferruginea* and *M. irukanda* including var. *bungoensis* are quite the same species. Although the nature of hairs on stems, leaves and pods has been regarded as a key character, it cannot be used to distinguish *M. ferruginea* or *M. irukanda* from *M. macrocarpa* and also var. *bungoensis* from the typical form of *M. irukanda*. In the shape of leaflets, the range of variations of *M. ferruginea* and *M. irukanda* falls within that of *M. macrocarpa*. Moreover, the number of seeds in one pod is apparently

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variable, though *M. irukanda* was described as having about 5 seeds. Wallich (1830) described as 5-10 seeds and Baker (1876) as 8-12 seeds. Indeed, so far as the specimens we have examined are concerned, pods of *M. macrocarpa* in eastern Himalaya contain usually 5 to 12 seeds or rarely 2 seeds. In connection with this character we examined the number of ovules in one ovary. The ovules were 12 and 15 in *M. macrocarpa* (Sikkim, Hara in 1967, TI), 16 and 17 (Formosa, Hayata in 1914, TI) and 11, 13 and 14 (Formosa, Sasaki in 1910, TI, type of *M. subferruginea*) in *M. ferruginea*, 11 in *M. irukanda* (Ryukyu, Kuroiwa s.n. TI) and 14 in *M. irukanda* var. *bungoensis* (Kyushu, Nagasawa in 1968, TI). Therefore, the number of ovules in one ovary varies continuously in these taxa.

In southern Kyushu this species grows in rather sparse forests to open places near the seashore, while in the eastern Himalaya and Formosa its habitat is in dense forests between 300-2000 m above the sea-level. Therefore, it seems to be natural that *M. macrocarpa* shows variation in accordance with the differences in the habitat.

Mucuna macrocarpa Wall., Pl. As. Rar. 1: 41, t. 47 (1830)—Baker in Fl. Brit. Ind. 2: 186 (1876)—Matsumura in Ito & Matsum., Tent. Fl. Lutch. 422 (1899); in Bot. Mag. Tokyo 16: 85 (1902); Index Pl. Jap. 2: 272 (1912)—Makino & Nemoto, Fl. Jap. 743 (1925); ed. 2, 589 (1931)—Hosokawa in Journ. Soc. Trop. Agr. 4: 488 (1932)—Li, Woody Fl. Taiwan 355 (1963)—Chuang & Huang, Legum. Taiwan 78, f. 116 (1966-7 non 1965)—Ohashi in Fl. E. Himal. 2: 67 (1971)—Thothathri in Rec. Bot. Surv. Ind. 20: 79 (1973).

M. gigantea DC. sensu Matsum. in Ito & Matsum., l. c. 422 (1899); in Bot. Mag. Tokyo 16: 85 (1902); Index Pl. Jap. 2: 272 (1912)—Makino & Nemoto, l. c. 742 (1925); ed. 2, 588 (1931).

M. ferruginea Matsum. in Ito & Matsum., l. c. 422 (1899); in Bot. Mag. Tokyo 16: 86 (1902); Index Pl. Jap. 2: 271 (1912)—Matsum. & Hayata in Journ. Coll. Sci. Univ. Tokyo 22: 110 (1906)—Hayata, Icon. Pl. Formos. 1: 197 (1911)—Makino & Nemoto, l. c. 742 (1925); ed. 2, 588 (1931)—Kanehira, Formos. Trees rev. ed. 305, t. 259 (1936)—Liu, III. Ligneous Pl. Taiwan 539, t. 470 (1960).

M. subferruginea Hayata, Icon. Pl. Formos. 3: 74 (1913)—Makino & Nemoto, l. c. 743 (1925); ed. 2, 589 (1931).

M. irukanda Ohwi in Journ. Jap. Bot. 12: 659 (1936); l. c. 38: 127 (1963);



Fig. 1. Distribution of *Mucuna macrocarpa*.

Fl. Jap. Engl. ed. 570 (1965); rev. ed. 807 (1965)—Masamune in Sci. Rep. Kanazawa Univ. 3: 136 (1955), ut *M. uzirukanda* Ohwi—Hatusima & Amano, Fl. Okinawa 48 (1958); rev. ed. 52 (1967)—Hatusima, Fl. Ryukyus 321 (1971 & 1975)—Kitamura & Murata, Colour. III. Woody Pl. Jap. 1: 350, f. 226 (1971).

M. membranacea Hayata sensu Masamune, l. c. 136 (1955).

M. irukanda var. *bungoensis* Ohwi, Fl. Jap. rev. ed. 1439 & 807 (1965)—Mashiba in Saishu-to-shiiku 33: 214 (1971).

M. ferruginea var. *irukanda* (Ohwi) Ohwi, Fl. Jap. new ed. 1453 (1975).

M. ferruginea var. *bungoensis* (Ohwi) Ohwi, l. c. 1453 (1975).

Distr. E. Himalaya, Assam, Burma, Indo-China, China (Yunnan), Formosa, Ryukyus, S. Japan (Kyushu). (Fig. 1)

2) *Mucuna gigantea* DC.

Mucuna gigantea DC. is one of the most variable and widely distributed coastal species in the genus. A number of allied species have been reported from the Pacific islands, Formosa and Malaysia.

M. Tashiroi Hayata was described from Formosa in 1913 but was treated as a synonym of *M. gigantea* by Hosokawa (1932). This treatment has been followed by Li (1963) and Hatusima (1975). However, both species are dif-

ferent from each other in the structure of flowers as shown in Figs. 2A and 3. In *M. Tashiroi* its vexillum is more than $4/5$ of the length of the wings, and the claw of the wings is about $1/3$ of the whole length of the wings, while in *M. gigantea* its vexillum is nearly $3/4$ of the length of the wings, and the wing-claw is shorter than $1/4$ of the whole length of the wings. The upper two lobes of calyx are connate near the top, but those in *M. Tashiroi* are more loosely connate than those in *M. gigantea*. The mature legumes of *M. Tashiroi* are quite similar to those of *M. gigantea*. Therefore, *M. Tashiroi* may better be recognized as a subspecies of *M. gigantea*.

When Nakai (1921) described *Mucuna Toyoshimae* (as *Toyoshimai*) as an endemic species of the Bonin islands, he put it near *M. gigantea* but distinguished it from the latter by its smaller leaflets, shorter peduncles, greenish flowers and few-seeded legumes. He thought *M. gigantea* has yellow flowers by misreading the Roxburgh's description which runs "large beautiful sulphur coloured flowers" (Fl. Ind. 3: 287, 1832). This endemic species has generally been adopted by the subsequent students on the flora of the Bonin islands, but recently Tuyama (1970) and Hatusima (1975) treated it as a synonym of *M. gigantea*. After examining the specimens of these species, it became clear that the ranges of variation of *M. Toyoshimae* in the size of leaflets, length of peduncles and 1-2-seeded legumes are entirely included within those of *M. gigantea*. However, the flowers of the type specimen of *M. Toyoshimae* are more or less larger than those of *M. gigantea* (Fig. 2). Since the shape of petals are quite similar in both species, we consider that the slight difference in flower-sizes and flower-colour is not sufficient to keep both as distinct. Accordingly, *M. Toyoshimae* is better to be regarded as identical with *M. gigantea*. This conclusion is the same as that of Tuyama and Hatusima, but it seems necessary to put synonyms and literatures of *M. gigantea* in order, because they did not cite any publications in their treatment.

Mucuna gigantea (Willd.) DC. subsp. ***gigantea***

Dolichos giganteus Willd., Sp. Pl. 3: 1041 (1802).

Carpopogon giganteum (Willd.) Roxb., Hort. Beng. 54 (1814); Fl. Ind. 3: 287 (1832).

Mucuna gigantea (Willd.) DC., Prodr. 2: 405 (1825)—Wight in Hook., Bot. Misc. 2: 351, suppl., t. 14 (1830)—Wight et Arn., Prodr. 1: 254 (1834)—

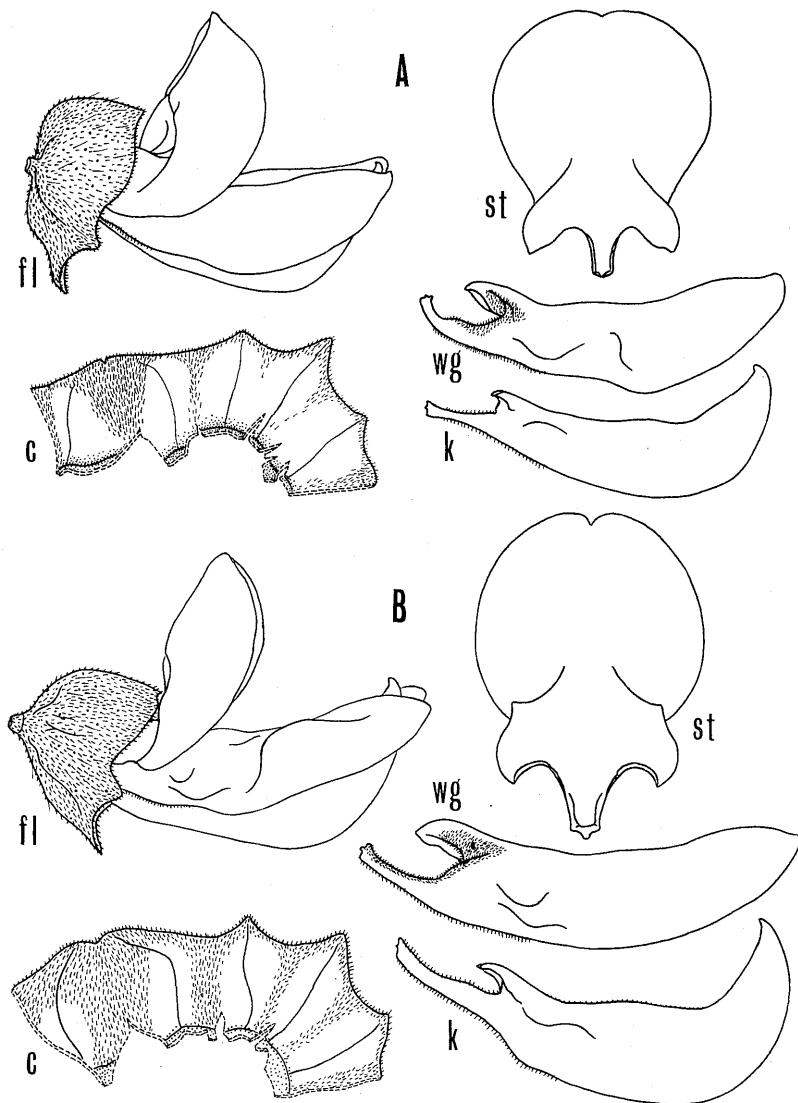


Fig. 2. Flowers of *Mucuna gigantea*. fl. Flower. st. Standard. wg. Wing. k. Keel-petal. c. Calyx dissected. All $\times 1.5$. A from Hawaii (St. John et al. 12713. TD), B from Bonin (Nakai, June 18, 1920, TI-syntype of *Mucuna Toyoshimae*).

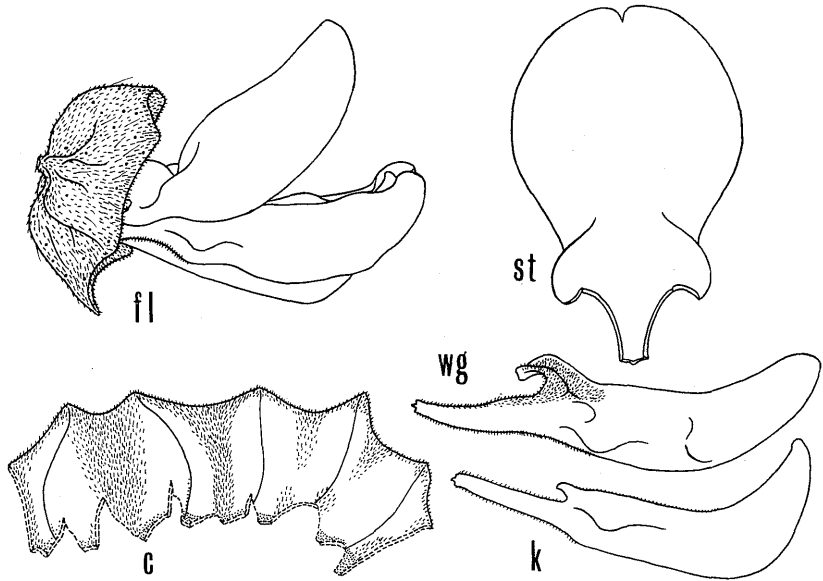


Fig. 3. Flower of *Mucuna gigantea* subsp. *Tashiroi*. fl. Flower. st. Standard. wg. Wing. k. Keel-petal. c. Calyx dissected. All $\times 1.5$. From Formosa (*Tashiro* in 1909, TI-type of *Mucuna Tashiroi*).

Miq., Fl. Ind. Bat. 1: 213 (1855)—Benth., Fl. Austr. 2: 254 (1864)—Baker in Fl. Brit. Ind. 2: 186 (1876)—Prain in Journ. Asiat. Soc. Beng. 66 (2): 408 (1897)—Merr. in Philip. Journ. Sci. 5: 116 (1910); Enum. Philip. Pl. 2: 308 (1923)—Gagnep. in Fl. Indo-Chine 2: 318, fig. 33, 7-14 (1916)—Ridley, Fl. Malay Penin. 1: 577 (1922)—Craib, Fl. Siam. Enum. 1: 443 (1928)—Backer & Bakh. f., Fl. Java 1: 630 (1963)—Tuyama in Tuyama & Asami, Nature Bonin 119, Color. Pl. 4-144 (1970 Oct.)—Hatusima, Fl. Ryukyus (suppl. 2) 882 (1975).

Stizolobium giganteum (Willd.) Sprengel, Syst. Cur. Post. 281 (1827).

M. Toyoshimai Nakai in Bot. Mag. Tokyo 35: 144 (1921)—Makino & Nemoto, l. c. 743 (1925); ed. 2, 589 (1931)—Tuyama in Zoku Ogasawarashotô Shizen Keikan Chyosa-hokokusho 155 (1970 March)—Yamazaki in Nature Bonin & Volcano Isl. 112 (1970).

Distr. India, S.E. Asia, Malaysia, Australia, Pacific islands, Ryukyus and Bonin.

***Mucuna gigantea* subsp. *Tashiroi* (Hayata) Ohashi & Tateishi, stat. nov.**

M. Tashiroi Hayata, Icon. Pl. Formos. 3: 75 (1913)—Makino & Nemoto, Fl. Jap. 743 (1925); ed. 2, 589 (1931).

M. gigantea DC. sensu Hosokawa in Journ. Soc. Trop. Agr. 4: 490 (1932), p. p.—Li, Woody Fl. Taiwan 355 (1963).

Distr. Formosa.

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1) 琉球からトビカズラ属を最初に発表したのは松村 (1899) であり、それはウヰルカンダ¹⁾ *Mucuna gigantea?*, *Mucuna macrocarpa?*, *Mucuna sp.* の3種である。そのもととなった標本は東京大学総合研究資料館植物標本室 (TI) にある。これらを調べたところ、ウヰルカンダ、*M. macrocarpa* および2枚ある *Mucuna sp.* のうち1枚はいずれも *M. macrocarpa* Wall. であり、*Mucuna sp.* の他の1枚が真の *M. gigantea* であった。ところが最近の琉球のフロラには *M. macrocarpa* は異名の中にさえも拾われておらず、かつ真の *M. gigantea* は初島のフロラ²⁾ で初めて正しく琉球から報告された有様である。

1899年以後、松村 (1902, 1912, 1916) はウヰルカンダと *M. macrocarpa*³⁾ の2種だけを琉球産として記録している。*Mucuna sp.* として引用された標本は後に2枚とも松村自身の手で *M. macrocarpa?* と書き加えられている。この2種だけを認めた松村の見解は牧野・根本 (1925, 1931) の日本植物総覧にも引き継がれている⁴⁾。台湾の *M. macrocarpa* を研究した細川 (1932) の論文では琉球の種類について単に文献が引用されただけである。大井 (1936) はそれ以前の松村のいう *M. gigantea* は真の *M. gigantea* でないことに気付き、ウヰルカンダを改めて琉球特産の新種とし、*M. irukanda* と命名した⁵⁾。また沖縄島とその付近のトビカズラ属はこの1種だけであることを簡単に紹介している。しかし *M. macrocarpa* については何もふれていない。その後は特に初島 (1971, 1975) によって琉球のフロラは著るしく解明されたが、*M. macrocarpa* とウヰルカンダとは今日まで比較されなかった。しかしヒマラヤ、台湾、琉球などの標本が多数得られて、改めて比較してみると、両者は全く同一種であると結論

- 1) この和名は当地の方言に基づいて松村がここで初めて発表したものである。論文の中では“Ujilu-kanda (nom. indigen.)”と記されているし、松村自身の採品 (Okinawa, Kunchan, 1897年) のラベルにも同様のことが書かれている。
- 2) 和名はワニグチモダマを採っている。われわれも一応それに従っておくが、これは再検討を要する。
- 3) 1902年では誤って台湾産、1916年には和名をヒメワニグチとしている。
- 4) ところが本書の *M. gigantea* と *M. macrocarpa* の記載文は、おそらく Baker (1876) に基づくもので、松村の意味する琉球の種類には一致しない。
- 5) 和名はウヰルカンダ、イルカンダ、ウズルカンダを挙げている。

できる⁶⁾。

2) 小笠原のミドリモダマ *Mucuna Toyoshimae* はワニグチモダマ *M. gigantea* DC. と同種であり、津山 (1970) と初島 (1975) の意見に賛成である。また従来ワニグチモダマと同種とされていた台湾のアオバナワニグチ *M. Tashiroi* Hayata は花が異なり、台湾特産なので、地理的な亜種とする。

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○Pecan nut の市販品名 (久内清孝) Kiyotaka HISAUCHI: Current Japanese market name of Pecan

近頃東京都内の売店で「手割グルミ」または「イスラエルグルミ」などの名称で、殻果が食卓用として売られているが、これは勿論米国原産の Pecan = *Carya illinoensis* (Wang.) Koch である。手割グルミは、恐らく手打グルミを模倣して作られた名称と思はれるが、イスラエルグルミとなると相像することもできない。いづれにしても市販品の名であるから、どうしてもよいようなものだが、勝手に名をつけられても困る。なにはともあれ、このものは大正 4 年 (1916) に、当時わが国の学徒と親交のあった Deane B. Swingle 博士が 農林省園芸試験場へ寄贈されたものを、これまた当時有名だった田中長三郎博士が、各地に之を分株したものの子孫であると思う。現在市販されているものは長野県産だと思はれる。ペカンには品種があるが、現在売られているものは、殻果が茶褐色で楕円形、4.5×2.5 cm 程度で、2 個を握ると容易に割れるので手割グルミの名が与えられたものと思はれる。 (東邦大学薬学部)

6) 和名はウヅルカンダを選ぶのが最もよいと考える。