Jin MURATA*: *Pterygocalyx* (Gentianaceae), new to Taiwan

邑田 仁*: 台湾で発見されたホソバノツルリンドウ

Pterygocalyx is a monotypic genus based on *P. volubilis* Maxim. Although Ohwi (1953, 1965), Satake (1981) and Kitagawa (1983) noted that *Pterygocalyx* was a genus of a few species, no other species has been described or recognized in it. *Pterygocalyx volubilis* has been known to be distributed widely in the temperate regions of eastern Asia but was not known previously from Taiwan. A new record of *P. volubilis* from Taiwan was found in the collections made on the botanical expedition to Taiwan organized by Prof. H. Ohashi of Tohoku University in 1982 and 1984. After a critical comparison of specimens from Taiwan and from other localities, no difference in morphology was found. This species appears rare in Taiwan but is expected to occur throughout the central mountain range of the island.

In Japanese floras, *P. volubilis* is described as being perrenial, but is actually an annual or biennial (monocarpic) species as has been stated in literature from outside Japan; Dr. Yamazaki suggested this based on a living plant collected in late autumn (T. Yamazaki 5373 TI), on which no winter buds were found.

Pterygocalyx is characterized by its slender, twisted stem and flowers being tetramerous and lacking appendages between the corolla-lobes. Although it has sometimes been included in *Crawfurdia* or *Gentiana*, the floral morphology strongly suggests a close alliance with *Gentianopsis* (=*Gentianella* sect. Crossopetalum) (Toyokuni 1963, Mason & Iltis 1965, Smith 1965), which is supported by similarities in pollen morphology (Ikuse 1956, Nilsson 1967).

The overall distribution range of *Pterygocalyx* is similer to that of *Gentianopsis* in eastern Asia (Fig. 1). This pattern is characteristic in excluding the Korean peninsula and the eastern part of the Chinese continent from its range. Toyokuni (1968) considered that the present range of *Gentianopsis* is strongly correlated to glaciation during the last (Würm) glacial advance. It is

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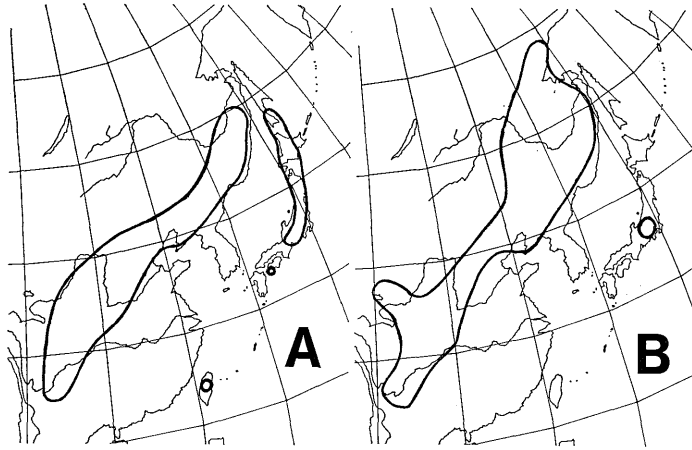

Fig. 1. Distribution maps of *Pterygocalyx volubile* Maxim. (A) and of the genus *Gentianopsis* Ma in E. Asia (B), based on Toyokuni (1968), Ma (1951), J. X. Yang (1983) and the present data.

notable that in *Gentianopsis*, nine Asiatic species, which are considered to have originated in eastern Asia (Toyokuni 1968) and two Eurasian species partly occupy, sometimes disjunctly, this range, while in *Pterygocalyx* a single species is distributed throughout the area.

Pterygocalyx volubilis Maxim., Prim. Fl. Amur. 198, t. 9 (1859); Bull. Acad. St.-Pet. **31**: 68 (1886). Hara, Bot. Mag. Tokyo **51**: 18 (1937); Enum. Sperm. Jap. 1: 140 (1948). Sugawara, Ill. Fl. Saghal. **4**: 1551, t 710A (1940). Ohwi, Fl. Jap. 948 (1953); ibid. English ed. 736 (1965); ibid revised ed. 1096 (1965). Kitamura, Murata, et Hori, Colour. Ill. Herb. Pl. Jap., Sympet. 218 (1957). Toyokuni, Journ. Fac. Sci. Hokkaido Univ. 7: 203 (1963). Kitagawa, Neo Lin. Fl. Mansh. 518 (1979). Satake in Satake et al., Wild Fl. Jap. **III**, 29 (1981). J. X. Yang, Fl. Tsinglingensis 1(4): 107 (1983).

Crawfurdia pterygocalyx Hemsl., Journ. Linn. Soc. **26**: 123 (1890). Kom., Fl. Mansh. **3**: 270 (1905). Matsum., Ind. Pl. Jap. **II**-2, 498 (1912). Makino et Nemoto, Fl. Jap. 343 (1925). Kom. et Alis., Key Pl. Far East. Reg. USSR **2**: 863, t. 262, f. 6 (1932). Ling, Fl. Ill. N. China **2**: 15, t. 2 (1933).

C. volubilis (Maxim.) Makino, Bot. Mag. Tokyo **4**: (86) (1890). Kitagawa, Lin. Fl. Mansh. 358 (1939). Grossgeim, Fl. USSR 18: 537 (1952).

C. volubilis (Maxim.) Gilg in Engl. & Plantl, Nat. Pfl.-fam. **IV**-2: 79 (1895). Okuyama, Journ. Jap. Bot. **13**: 34 (1937).

Gentianella volubilis (Maxim.) H. Smith, Grana Palynol. **7**: 144 (1967).

Specimens from Taiwan. Nantou Co.: Yunfeng, alt. 2700-2750 m, Oct. 17, 1982, H. Ohashi, Y. Tateishi, J. Murata, Y. Endo, T. Nemoto & Y. Ueno 12533 (TUS). Taichung Co.: Mt. Nanhuta-shan, the base-Suyuanakou, alt. 1950-2350 m, Sept. 13, 1984, Y. Tateishi, J. Murata, T. Nemoto, Y. Endo, H. Sakai & H. Iketani 19183B (TUS).

Distribution. Taiwan, northern and western China, Korea (northern border), Japan (Hokkaido, Honshu, Shikoku), Amur, Ussuri and Sachalin in the Soviet Union.

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References

Ikuse, M. 1965. Some palynological data. Journ. Jap. Bot. **31**: 27-28. Kitagawa, M. 1983. *Pterygocalyx* in New flora of Japan. 1230. Shibundo, Tokyo. Mason, C.T. & H.H. Iltis 1965. Preliminary reports on the flora of Wisconsin No. 53. Gentianaceae and Menyanthaceae. Trans. Wisconsin Acad. Sci. Arts & Lett. **54**: 295-329. Nilsson, S. 1967. Pollen morphological studies in the Gentianaceae-Gentianinae. Grana Palynol. **7**: 46-145, pt. 1-28. Ohwi, J. 1953 & 1965. *Pterygocalyx* in Flora of Japan. 948 & ibid. (revised edition) 1096. Shibundo, Tokyo. Satake, Y. 1981. *Pterygocalyx* in Satake et al., Wild flower of Japan. **III**, 29. Heibonsha, Tokyo. Smith, H. 1965. Notes on Gentianaceae. Not. Roy. Bot. Edinb. **26**: 237-258. Toyokuni, H. 1963. Conspectum Gentianacearum Japonicarum. Journ. Fac. Sci. Hokkaido Univ. V, 7(4): 137-259, pl. 1-4. —— 1968. Notes on *Gentianopsis* with special reference to Japanese species (part 2). Symbolae Asahikavensis **3**: 137-146. Yang, J.X. 1983. *Pterygocalyx* in Flora Tsinlingensis 1(4): 107.

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ホソバノツルリンドウは従来，東アジアの大陸部と樺太および日本に分布することが知られていた。最近，台湾産植物の調査（代表者 大橋広好東北大学教授）により，2度にわたって本種が採集されたのでこれについて報告する。ホソバノツルリンドウの分布は，最も近縁なシロウマリンドウ属 *Gentianopsis* の東アジアにおける分布とよく似ているが，後者のような地域的な種分化は認められない。なお，大井の日本植物誌(Ohwi 1953, 1965) などに，ホソバノツルリンドウ属 *Pterygocalyx* には数種があり，多年草となっているのは誤りで，本属は1属1種で，1年草（越年草）である。これは *Pterygocalyx* と *Crawfurdia* を混同したことから生じたものではないかと思われる。

○Materials for the distribution of lichens in Japan (10) 地衣類分布資料 (10)

○ **Parmelia crenata** Kurok. This species was described in 1964 (Hale & Kurokawa, Contr. U.S. Nat. Herb. **36**: 121-191) on the basis of a specimen collected on Mt. Kuishi, Prov. Tosa, south-western Japan. It was reported from Papua New Guinea by Gressitt et al. (Science **150**: 1833-1835. 1965). However, Kurokawa (in S. Kurokawa: Studies on Cryptogams of Papua New Guinea 125-148. 1979) excluded the species from the lichen flora of Papua New Guinea. Consequently, this species is at present known only from the type locality. Among lichen specimens preserved in TNS, two specimens collected in Japan, one from Prov. Musashi in eastern Japan and the other from Prov. Awa in south-western Japan, are identified with *P. crenata*, because of the presence of dichotomous rhizines and cylindrical isidia and the production of atranorin, norstictic acid, and stictic acid. Outside of Japan, in addition, six specimens of this species have been collected: three from Taiwan, one from Thailand, and two from Java, as shown below.

Specimens examined. Japan. Honshu. Prov. Musashi: Mt. Mitsumine, Chichibu, elevation 1100-1332 m, S. Kurokawa 64318 (TNS). Shikoku. Prov. Awa: Mt. Ohmori, Kitoh-mura, Naka-gun, elevation about 800 m, S. Kurokawa 83036 (TNS). Taiwan. Chiayi Pref.: En route from Susulu to Mt. Ali, elevation 2000-2200 m, S. Kurokawa 628 (TNS, LD, TAI) and 629 (TNS). Kaoshing Pref.: Shunshan, Mt. Nanfong, elevation about 1200 m, S. Kurokawa 2927 (TNS). Thailand, Prov. Chieng Mai: Maetang District, elevation about 1000 m,