Tripterosperrnum distylum J. Murata et Yahara
(Gentianaceae), a new species from
Yakushima Island, Japan

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邑田仁・矢原徹一：屋久島産ツルリンドウ属の新種


36 (4-6) : 162-166 November 1985
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Jin Murata* and Tetsukazu Yahara*

Tripterospermum Blume includes about 20 species and is a genus widely distributed in eastern Asia. Only *T. japonicum* (Sieb. et Zucc.) Maxim. has been reported from the Japan Archipelago. Recently, in the course of our revisional studies on the flora of Yakushima Island, which is located 70 km south of the mainland of Kyushu, we discovered another species of *Tripterospermum* endemic to the island. The fruits of this new species indicates that it belongs to the “capsular group” of *Tripterospermum* (Smith 1965), which was previously known only from continental eastern Asia.

*Tripterospermum distylum* J. Murata et Yahara, sp. nov (Fig. 1).

Planta perennis scandens, ex affinitate *T. coerulei* (Hand.-Mazz.) H. Smith, a qua distat: Folii minore, 12–40(–55) mm longis 6–30(–55) mm latis, plerumque ovatis raro lanceolatis (nec 60–70 mm longis 11–17 mm latis, lanceolatis), corollis campanulatis, 10–14 mm diametro (nec 8 mm).


A small scandent perennial herb; stems slender, quadrangular, spirally twisted, sometimes branched, up to 1 m long, internodes 3–7 cm long in middle section of main stem. Leaves petiolate; lamina of cauline leaves usually membranaceous, broadly ovate to ovate, trinerved, 3–4 cm long, 1.5–3 cm wide, acuminate at apex, cordate to rounded at base; petiole 5–12 mm long; but in sunny places lamina sometimes thick herbaceous, narrowly ovate, 1.2–2.5 cm long, 6–11 mm wide, rounded to truncate at base, with petiole 2–5 mm long. Flowers light blue-purple, axillary or terminal, usually solitary;

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pedicels up to 8 mm long, with small leaf-like bracts. Calyx campanulate; tube 5 nerved, 6–8 mm long; lobes linear, equal in length, 4–6(–10) mm long, 0.5–1(–2) mm wide. Corolla campanulate, 3.0–3.5 cm long, 1–1.4 cm wide, dilated and 5 lobed at
mouth; lobes broadly triangular, ca. 4 mm long, ca. 5 mm wide, abruptly acuminate at apex; sinuses pllicate rounded or round triangular, 1–2 mm long, ca. 3 mm wide, almost entire. Stamens 5, longer than pistil, 2.3–3 cm long, basal ca. 1 cm adnate to corolla, filaments narrowly winged, unilaterally incurved near apex; anthers ca. 1 mm long. Ovary narrowly spindle-shaped, long stipitate, 1.5–2 cm long including stipe; style 6–7 mm long, split its whole length into two stigmatic branches, the upper parts recurved at anthesis. Immature fruit appressed-cylindric, stipitate, capsule. Immature seeds compressed and unequally trigonous.

Japanese name: Hanayama-tsururindo.

Distribution: Japan, Kagoshima Pref., Yakushima Is: Hanayama Forest Reserve, Migimata (1050 m)–Nakamata (1180 m–1200 m)–E Slope of Mt. Koyoji (1400 m), Oct. 26, 1983, J. Murata, T. Yahara & H. T. Im 15979 (T1, KYO, NY, KUN, SZ, TAI); Yakusugi Land (1000 m)–Mt. Tachudeke (1450 m)–Mt. Ishizukayama (1590 m), Oct. 23, 1983, J. Murata, T. Yahara & H. T. Im 15831 (Type); Hanayamahodo (520 m)– Nagatatadake (1886 m), Oct. 2, 1984, J. Murata, S. Sakai & H. T. Im 17198 (T1, KYO); en route from Kuromi woodland path to Hananoego swamp, along Kuromi trail, ca. 1200–1700 m alt. in mixed deciduous forest, Nov. 2, 1983, G. Murata, T. Takagi, S. Mitsuta, H. Doei, H. Nagamasu & A. Iwami 327 (KYO); en route from Hananoego to the summit of Mt. Miyanouradake, alt. 1800 m, in open herbfield, Sept. 2, 1977, K. Iwatsuki, N. Fujita, K. Ueda & H. Nishida 91 (KYO); without precise locality, Nov. 1921,
G. Koidzumi s.n. (KYO).

The genus *Tripterosperrum* was confused with *Crawfurdia* WALL. and a part of *Gentiana* L. until Smith's (1965) investigation established its contemporary generic delimitation. The presence of a collar-like disk at the base of the style, 5 vascular bundles in the calyx tube and stamens unilaterally curved in the upper part in the present species clearly shows that it belongs to *Tripterosperrum* as revised by Smith. (Although Smith described the direction of the curvature of the stamens in the upper part as "downwards", all the species we have seen from Japan and Taiwan, including this new species, have the stamens curved upwards in life.) Based on the nature of the fruit, Smith recognized two natural groups, "capsular" and "baccate" in this genus. The former is characterized by capsular fruits and compressed, unevenly trigonous seeds. While, the latter is characterized by baccate fruits and evenly trigonous seeds. The carpels of the immature fruits of *T. distylum* we examined have marginally thickened keels inside and a distinct midvein (Fig. 2A, B); these features are characteristic of the fruits of the capsular group (e.g. in *T. affine* Fig. 2C, D) and not observed in the fruits of the baccate group regardless of age. Furthermore, the immature seeds of *T. distylum* agree well with those of the capsular species described by Smith (Fig. 3). Based on this evidence, *T. distylum* is placed with the capsular species.

The capsular group includes *T. fasciculatum* (Wall.) Chatter occurring from Nepal to Assam, Burma and S China, *T. cartesi* H. Smith described from Chekiang, China, *T. coeruleum* (Hand.-Mazz.) H. Smith and *T. caudatum* (Marq.) H. Smith from Szechuan, China, *T. discoideum* (Marq.) H. Smith from Hupeh, China and *T. distylum*. Among them, *T. distylum* is most similar to *T. coeruleum* in gross morphology but differs from it in the broader corolla tube and in the shorter but wider (12–40(–55) mm × 6–30(–55) mm) and usually ovate leaves in *T. distylum*; the leaves are 60–70 mm × 11–17 mm and lanceolate in *T. coeruleum*.

From a phytogeographical point of view, it is interesting that *T. distylum* occurs quite disjunctly from the other members of the capsular species distributed in continental Asia and mainly southern China. *Gentiana yakushimensis* Masamune, an endemic species on Yakushima Island also has its closest allies on the Asian continent (Toyokuni 1960). These examples indicate that the endemic flora of Yakushima Island includes relictual elements related to continental Asia.

On the highlands of Yakushima Island, there are two species of *Tripterosperrum*, *T. distylum* and *T. japonicum* var. *tenue* Masamune, which is also an endemic to this island. They differ not only morphologically but also ecologically and can be separated by the following key.
Fruit a capsule; corolla more than 3 cm long; calyx lobes laterally very weakly or not at all compressed; growing on sharrow soil in rocky place; flowering season between late September and November; fruits maturing in November. .............................................. T. distylum
Fruit a berry; corolla less than 2 cm long; calyx lobes laterally compressed and descending along the tube as a wing; growing in deep soil in the forest; flowering season between August and November; fruits beginning to mature in September. .............................................. T. japonicum var. tenue

Acknowledgement We express our sincere thanks to Prof. K. IWATSUKI of the Botanical Gardens, the University of Tokyo for his advise and encouragement during this study and to Mr. Kanenori MIURA of the Environment Agency, Japan for his co-operation in the field work. Thanks are also due to Drs. D. E. BOUFFORD and V. I. SULLIVAN for their reading of manuscript and to the curators of the following herbaria for letting us study the specimens under their care: BM, KYO, TAI, TUS.

This work was supported by a Grant from The Nippon Life Insurance Foundation in 1983–84 and a Grant in Aid for Scientific Research to J. M. (No. 58340039) from the Ministry of Education, Science and Culture, Japan.

References

摘要 筆者らは屋久島の植物相の再検討を進めているが、その過程で、屋久島に固有のツリンドウ属の新種があることが明らかになったので、ハナヤマツリンドウ Tripterospermum distylum J. Murata et Yahara と命名し発表する。SMITH (1960) によれば、ツリンドウ属には萌果をもつ“capsular group”と漿果をもつ“baccate group”の2つの自然群が認められる。本種はツリンドウ T. japonicum (Sieb. et Zucc.) Maxim. とは異なり、前者に属する。萌果群の中では、四国県で記載された T. coeruleum (HAND.-MAZZ.) H. SMITH に最もよく似ているが、葉が小型で幅広く、花冠がより太い点で異っている。従来、萌果群の種はヒマラヤ、アッサムから中国大陸南部にかけての地域にのみ知られており、屋久島での新たな発見は植物地理学上注目される。屋久島産の固有植物の中には他にも、ヤクシマツリンドウのように近縁種がアジア大陸に隔離分布するものが知られている（TOYOKUNI 1960）。屋久島産固有植物の類縁については今後、中国大陸の種との比較検討を十分に行なう必要がある。なお、本種が分布する屋久島の高地には、ツリンドウの矮小型のヤクシマツリンドウ T. japonicum var. tenue (MASAMUNE) HONDA も分布しているが、両者は以下のような点で形態的・生態的に明瞭に区別できる。

ハナヤマツリンドウ 果実は萌果、花冠は長さ3 cm以上、卵形はほとんど左右から扁平でない。岩場の浅い土壌の上に生える。花期は9月末から11月、11月に結実する。
ヤクシマツリンドウ 果実は漿果、花冠は長さ2 cm以下、卵形は左右から偏平で筒部に流れ、翼となっている。林床の深い土壌の上に生える。花期は8月から11月、9月に結実し始める。