

台湾のツレサギソウ属

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Ken INOUE* & Tsan-Piao LIN** : Orchid Genus, *Platanthera* of Taiwan

井上 健・林 讚標：台湾のツレサギソウ属

Platanthera is a genus of tribe *Orchideae* of subfamily *Orchidoideae* and is composed of 100 species or more. It is widely distributed in the North Temperate Zone, as well as in the alpine zone of subtropical regions. Several species also occur in the tropical regions of Central America, North Africa and Asia.

In eastern Asia, *Platanthera* is principally found in Mainland China and Japan, except that two species occur in southeastern Asia (*P. angustata* and *P. blumei*). More than forty species are found in China (HU, 1975), and twenty species in Japan including Ryukyu (MAEKAWA 1971, GARAY et SWEET 1974). In Taiwan, *Platanthera* is the largest genus of tribe *Orchideae*. We have had more than ten epithets for *Platanthera* in the literature, but they have not been revised yet.

Habenaria is the closely related genus to *Platanthera*. *Platanthera* has been included in *Habenaria* by some authors (SMITH 1905, AMES 1908, CORRELL 1950, HOLTUM 1957, HITCHCOCK et al. 1969), but recently these two genera are generally treated separately. Diagnostics of each genus can be distinguished as follows;

Habenaria

(1) Distribution: mainly in tropics; (2) Sinker: tuberous; (3) Lip: 3-lobed or 3-partite; (4) Stigma: 2 stigmatic lobes protruding into separate processes; (5) Stamen: usually with a long tubercular.

Platanthera

(1) Mainly in temperate zone and arctic; (2) Stolonerous or fusiform (Fig. 1); (3) Usually entire; (4) 3 stigmatic lobes forming a plane; (5) Not protrude into any tubercular.

The term "sinker" is used here as a subterranean organ which initiates a new shoot. Sinker of *Platanthera* has peculiar morphology, being considered a chimera of stem and root, which has been discussed by OGURA (1953) and KUMAZAWA (1958).

In Taiwan, distributions of *Habenaria* and *Platanthera* are separated by the altitude. *Habenaria* mainly occur in 300–700 m and *Platanthera* in 1400–3800 m except one occurring below 700 m in altitude.

Taiwanese species of *Platanthera* and *Habenaria* possess characteristics in leaf arrangements: in *Platanthera*, leaves mainly attach throughout the stem and upper leaves tend to reduce their sizes; in *Habenaria*, leaves mainly congest in the middle

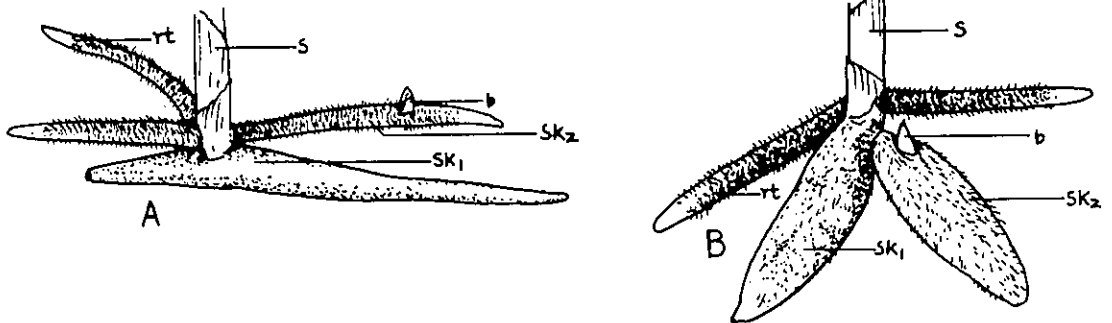


Fig. 1. Subterranean organs of *Platanthera*.

A. *P. brevicatcarata* showing stoloniferous type of sinker. B. *P. mandarinorum* subsp. *pachyglossa* showing fusiform type of sinker. b, bud. rt, root. s, stem. sk₁, remain of sinker of former year. sk₂, new sinker.

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of the stem.

In Taiwanese species there are differences of habitats. *Platanthera* usually grows on the exposed grassy slope and the vegetative parts gradually wither after flowering. *Habenaria* grows in the forest and the vegetative parts remain green in winter. Based on the above descriptions, we found that these two related genera can be distinguished in Taiwan.

In Taiwan, *Platanthera* was studied first by Dr. HAYATA, who reported five species as the endemic. Afterwards, each of Dr. SCHLECHTER, Dr. MASAMUNE and Drs. OHWI et FUKUYAMA added one species as the endemic. But these studies were based on only limited specimens. Therefore the comparative study of *Platanthera* between Taiwan and the adjacent regions was insufficient.

We have collected the fresh materials, and examined the type specimens which are deposited in the herbaria of Tokyo University (TI), Kyoto University (KYO) of Japan and Taiwan University (TAI), Taiwan Forestry Research Institute (TAIF) of Republic of China. We recognized eight species including two new taxa. Among those, three species are endemic and five species are widely distributed in eastern Asia.

We distinguish these eight species into three groups. PFITZER (1889) had divided this genus into two sections: 1. *Fillicones*, with a thin and long spur and 2. *Crassicornes*, with a stout and short spur. But the character of spur is not appropriate to separate into the section. The length and breadth of spur varies greatly among closely related species.

In the course of our studies, attention has been especially given to the structure of sinker and column. After examining most of the fresh materials of both Taiwan and Japan and of the works of America and Europe, we think sinker organ (Fig. 1) and the structure of column are valuable in dividing the genus into groups. It is concluded that *Platanthera* can be separated into the following three sections.

Key to the sections and species

Sinker stoloniferous; new shoot initiating from the horizontal sinker, occurring with a distance

from the stem. Stigma more or less protruded anteriorly; viscidium naked; lip entire. (Section *Brevicalcarata*)

Flower white; lip reflexed at the apex.

1. *P. brevicalcarata*

Flower greenish; lip turning upwards.

2. *P. longicalcarata*

Sinker stoloniferous; new shoot initiating from the horizontal sinker, occurring with a distance from the stem. Stigma more or less protruded anteriorly; viscidium contained in the pouches; lip with two small lateral lobes at the base. (Section *Tulotis*)

3. *P. devolii*

Sinker fusiform; new shoot initiating near the stem base. Stigma more or less concave; viscidium naked; lip entire. (Section *Platanthera*)

Dorsal sepal and petals forming a hood, sometimes not clasping closely.

Lateral sepals falcately ovate; lip base with callus toward stigma.

4. *P. sachalinensis*

Lateral sepals linear; lip base without callus.

Tuber fusiform; lateral sepals reflexed downwards, acute at tip.

5. *P. yangmeiensis*

Tuber ellipsoid; lateral sepals patent and reflexed, rounded at tip.

6. *P. minor*

Petals pointing outwards at tip, never connivent with dorsal sepal forming a hood.

The basal leaf much larger than the other scale leaves.

7. *P. stenoglossa*

The upper leaves decreasing in size.

Leaf oblanceolate, inserted obliquely to the stem; dorsal sepal broadly ovate.

8. *P. mandarinorum* subsp. *pachyglossa*

Leaf lanceolate, inserted with right angle to the stem; dorsal sepal deltoid.

9. *P. mandarinorum* subsp. *formosana*

Section *Brevicalcarata* K. INOUE, sect. nov.

1) *Platanthera brevicalcarata* HAYATA in Journ. Coll. Sci. Univ. Tokyo 30 (1): 350 (1911) (Mat. Fl. Form.); SCHLTR. in Fed. Repert. Beih. 4: 109 (1919); YING, Col. Ill. Ind. Orch. Taiwan 1: 288, 362 (1977); LIU et SU in Fl. Taiwan 5:

Rhizoma stoloniformis; tuber stoloniforme, horizontale; stigma antice plus minusve projectum; viscidia nudiuscula; labellum integrum.

Typus sectioni: *Platanthera brevicalcarata* HAYATA.

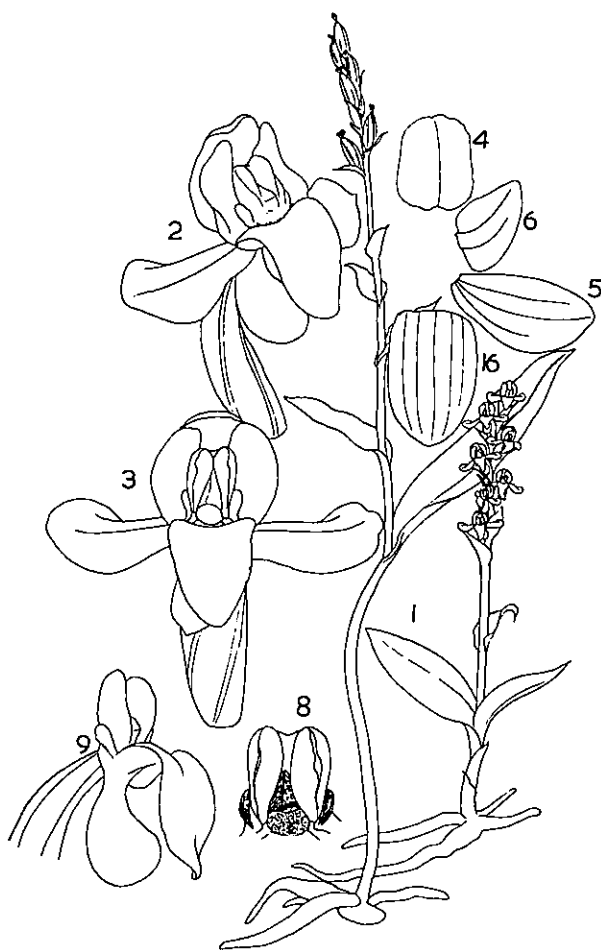


Fig. 2. *Platanthera brevicarata*

1, plant and inflorescence. 2, side view of flower. 3, front view of flower. 4, dorsal sepal. 5, lateral sepal. 6, petal. 7, bract. 8, front view of column. 9, side view of column. 10, leaf tip. 11, subterranean organ. 12, underside view of flower. 13, pollinarium. 14, cross section below stigma. 15, median longitudinal section of column and lip. 16, lip. These explanations are the same in all figures.

1092 (1978). (Fig. 2).

Sinker stoloniferous; new shoot initiating from the horizontal sinker, occurring with a distance from the stem. Plant up to 15 cm tall. Large leaves one or two, oblong-elliptic, acute, about 4 X 2 cm. Inflorescence subdensely 4-10 flowered. Bracts lanceolate, 7-11 mm long, equalling or exceeding the pedicel with ovary. Flowers white, about 1 cm across; pedicel with ovary 7-10 mm long; dorsal sepal ovate or rhombate, 3X2.3 mm,

1-nerved, obtuse; lateral ones spreading, ovate-lanceolate, 4.6X2.3 mm, 1-(-3)-nerved; petals obliquely ovate or triangular, 2.8X1.8 mm, 1-2-nerved; lip oblong, obtuse, 4.6X2.3 mm, reflexed at the apex; spur short, cylindric, rounded, 3 mm long. Column 1.5X1 mm. Anther loculi parallel; connective narrow; pollinarium ca. 1.3 mm long; viscidium naked, suborbicular; staminodes conspicuous. Rostellum convex. Stigma protruded anteriorly from the anther.

Occurrence: Yushan (Mt. Morrison, T. KAWAKAMI 2332, Oct. 18, 1906, Type in TI; K. SEGAWA s.n., July 20, 1935, TI; SASAKI s.n., Oct. 9, 1909, 3700m, TAIF; HIRAKAWA 99, July 6, 1934, KYO; J. OHWI 3653, July 5, 1933, KYO; J. OHWI 3730, July 6, 1933, KYO); Ta-pa-chien-shan (LIN 371, July 1, 1976, TAI et TAIF; KO-DAIRA 16665, TI); Kwan-shan-ling-shan (LIN 446, July 16, 1979, 3000m, TAIF); Ali-shan (U. FAURIE 921, June 1914, KYO et TI); Ra-ra-shan (MATSUDA s.n., July 27, 1918, TAIF); Nan-hu-ta-shan (SASAKI s.n., July 23, 1922, 2700m, TAIF; N. FUKUYAMA s.n., July 9, 1937, TI, pro parte; T. YAMAZAKI et al. 436, Aug. 22, 1969, TI; KOJIMA s.n., July 19, 1933, KYO; SHIOMI s.n., July 21, 1933, KYO; J. OHWI 3939, July 18, 1933, KYO); Hohuanshan (HSU s.n., Aug. 25, 1976, TAI); Hsueshan (MORI s.n., Oct. 22, 1936, TI); Sikayotaizan (MASAMUNE s.n., July 7, 1930, TAI; SUZUKI s.n., July 7, 1930, TI); Kwan-shan (SASAKI s.n., July 23, 1932, TAI; OKAMOTO 14, July 24, 1938, KYO); Kiraisyunanpo (SASAKI s.n., Aug. 24, 1929, TAI); Nengkaoyuen (J. OHWI 2930, June 13-15, 1933, KYO; J. OHWI 3308, June 19-24, 1933, KYO); Tai-tung Shan, Sungshan (J. OHWI 1489, May 6, 1933, KYO).

Distribution: Japan.

Flowering seasons: May-July.

The stigma of this species is protruded anteriorly from the anther; this structure of the

column was discussed recently by the junior author (INOUE, 1979). By the leaf number and flower feature, the Japanese plants are sometimes recognized as subsp. *yakumotana* (MASAM.) MASAM. (MASAMUNE, 1964; INOUE, 1979).

This species is widely distributed on the island at an altitude of 1400m to 3600m. The white flower is only a single species found in this genus in Taiwan.

2) *Platanthera longicalcarata* HAYATA, Mat. Fl. Formos. 350 (1911) exclude specimen of Ganzan; SCHLTR. in Fed. Repert. Beih. 4: 113 (1919). (Fig. 3).

Tulotis longicalcarata (HAYATA) LIU et SU in Fl. Taiwan 5: 1124 (1978).

Sinker stoloniferous; new shoot initiating from the horizontal shinker, occurring with a distance from the stem. Plant 20-55 cm tall. Large leaves one or two, usually the basal one larger, oblong-ob lanceolate, 8-15×3-3.5 cm. Inflorescence subdensely 8-16 flowered. Bracts lanceolate, 4-11 mm long, the lower ones equalling or longer than the pedicel with ovary. Flowers greenish; pedicel with ovary 6-9 mm long; dorsal sepal ovate-deltoid, 3.5×3.3 mm, 1-nerved; lateral ones reflexed, ovate-lanceolate, 4.5×2 mm, 1-nerved; petals obliquely deltoid, 4.5×1.8 mm, 1-nerved, connivent with the dorsal sepal to form a hood; lip ovate-triangular, turning upwards or towards forwards, 5×1.8 mm; spur arcuate, 6-8 mm long. Column 1.8 mm across, with two small processes at the base of front edges and continuing to the lip. Anther connective narrow; loculi a little wider at base; staminodes conspicuous; pollinarium 1.5 mm long; viscidium

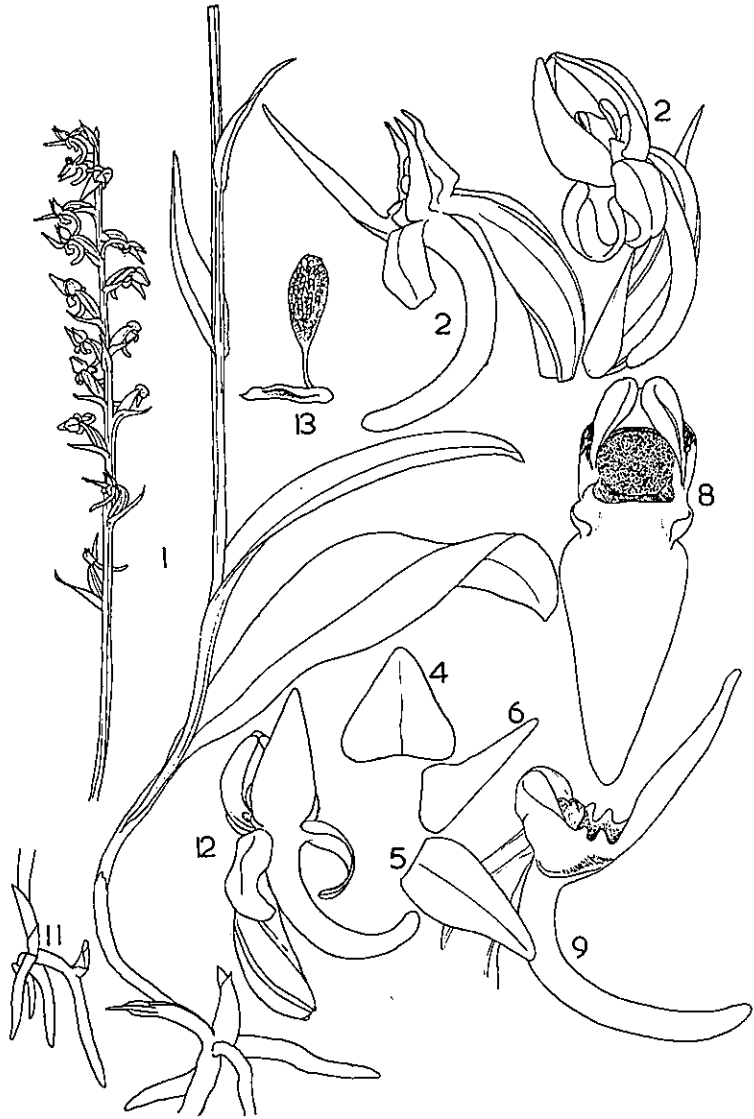


Fig. 3. *Platanthera longicalcarata*

naked, lanceolate. Rostellum curved, lying on the same plane of anther. Stigmatic surfaces flat and protruded anteriorly.

Occurrence: Rantashan (B. HAYATA et U. MORI s.n., Aug. 1908, Lectotype in TI; Sintype in TAIF et TAI); Yushan (T. et F. YAMAZAKI 794b, 2700 m, Sep. 7, 1969, TI); Ali-shan (IDZUMI et TOGASHI s.n., Oct. 26, 1976, TI); Tungpu (LIN 76, Sep. 20, 1974, about 2800 m, TAIF); Kwan-shan (OKAMOTO 11, July 25, 1938, KYO).

Distribution: Endemic.

Flowering seasons: July-September.



Fig. 4. *Platanthera devolii*

After having examined the type specimens of *P. longicalcarata* which is deposited in TI, the junior author found that the type specimens (location: Randaizan & Ganzan) is a mixture of different plants and HAYATA seemed to write his description from both specimens. The junior author judged that plant from Randaizan corresponds with the original description and so chose it as the lectotype.

P. longicalcarata is narrowly distributed only in central Taiwan, usually grows on the slope along the roadside, but not completely exposed under sunlight.

Section *Tulotis*

LUER, Native Orch. United States & Canada, 178 (1975). *Tulotis* RAFINESQUE, Herb. Raffin. 70 (1833); FL. Tellur. 2: 37 (1837). *Perularia* LINDLEY, Bot. Reg. t. 1701 (1834), nom. nud.; Gen. et Sp. Orchid. 281 (1835).

Typus sectioni: *Platanthera herbiola* (R. BROWN) LINDLEY

3) *Platanthera devolii* (LIN et HU) T. P. LIN et K. INOUE, comb. nov. (Fig. 4).

Tulotis devolii LIN et HU in Quart. Chin. For. Journ. 2 (1): 53 (1976).

Platanthera longicalcarata HAYATA, Mat. Fl. Form. 350 (1911), pro parte.

Habenaria longicalcarata (HAYATA) YING, Col. Ill. Ind. Orch. Taiwan 1: 379 (1977).

Sinker stoloniferous; new shoot initiating from the horizontal sinker, occurring with a distance from the stem. Plant 20-35 cm tall. Large leaves two, usually the basal one larger, linear, acute, up to 10X1.5 cm. Inflorescence 10-25 cm long, laxly or subdensely 5-16 flowered. Bracts lanceolate, 5-15 mm long, the lower ones equalling or slightly longer than the pedicel with ovary. Flowers yellowish green, ca. 9 mm in diameter; dorsal sepal concave, broadly ovate, 3X3 mm, 3-nerved; lateral ones spreading or reflexed, ovate to oblong, 4.5X2.7 mm, 3-nerved; petals obliquely oblong, 4X1.5 mm, 1-nerved, connivent with the dorsal sepal to form

a hood; lip fleshy, ca. 7 mm long, 5 mm wide, trilobed at the base, the midlobe broadly linear, obtuse, 6×2 mm, the lateral lobes triangular, 2×1 mm; spur slender, curved downwards, 10-13 mm long. Column 2 mm across; front parts of column base extending and curving upwards into a sac to hold the viscidium. Anther loculi parallel, somewhat distant, 1 mm long; connective narrow; pollinarium 2 mm long; viscidium strongly incurved, contained in pouches on both ends of rostellum; staminodes conspicuous. Rostellum strongly curving inwards, lying between the anther loculi. Stigma embraced by the rostellum, rhombate, protruded anteriorly.

Occurrence: Ali-shan (LIN 147, 1900 m, Holotype in TAIF); Ya-kou (LIN 441, July 16, 1979, 2400 m, TAIF); Yushan (Ganzan, S. NAGASAWA 697, Oct. 1905, a part of type specimens of *P. longicalcarata* in TI; G. NAKAHARA s.n., Oct. 1905, TI; collector unknown, Oct. 27, 1940, TI; T. et F. YAMAZAKI 794c, Sep. 7, 1969, TI); Kwan-shan (OKAMOTO 20, July 24, 1938, KYO); Nen-kouyu (J. OHWI 3170, June 13-15, 1933, KYO).

Distribution: Endemic.

Flowering season: June-September.

As mentioned above, type specimens of *P. longicalcarata* is a mixture of different plants. Therefore it becomes necessary to separate and name the plant of Ganzan from the type. The plant corresponds with *Tulotis devolii* which previously reported by the senior author in 1976. We would rather favor including *Tulotis* under *Platanthera*, so the name of this species must be changed to *P. devolii*.

From the flower size and shape of perianth and column structure (especially rostellum and viscidium), this species bears much resemblance to *P. fuscescence* (*Tulotis asiatica*) rather than to



Fig. 5. *Platanthera sachalinensis*

P. ussuriensis (*Tulotis ussuriensis*).

Section *Platanthera*

Typus sectioni: *Platanthera bifolia* (L.) L. C. RICHARD

4) *Platanthera sachalinensis* FR. SCHMIDT in Reisen Amurl. 181 (1868); LIN in Nat. Orch. Taiwan 2: 20 (1977). (Fig. 5).

Platanthera longibracteata HAYATA, Icon. Pl. Formos. 4: 122 (1914); SCHLTR. in Fed. Repert. Beih. 4: 122 (1919); YING, Col. Ill. Ind. Orch. Taiwan 1: fig. 129, 290, 365 (1977); LIU et SU in Fl. Taiwan 5: 1094 (1978), syn. nov.

Platanthera transnokoensis OHWI et FUKUYAMA in Bot. Mag. Tokyo 48: 297 (1934), syn. nov.

Tulotis ussuriensis (REGEL) HARA var. *transnokoensis* (OHWI et FUKUYAMA) LIU et SU in Fl. Taiwan 5: 1126 (1978).

Habenaria transnokoensis (OHWI et FUKUYAMA) YING, Col. Ill. Ind. Orch. Taiwan 1: 380 (1977).

Sinker fusiform; new shoot initiating near the stem base. Plant 40-60 cm tall, rather stout. Large leaves 1-3, the lowest ascending, obovate-oblong, 8-15X3-5 cm, obtuse, narrowed into a sheath; the upper leaves gradually grow small, acute. Inflorescence 10-30 cm long, densely 20 or more flowered. Bracts lanceolate, 6-27 mm long, exceeding the pedicel with ovary. Flowers whitish green; pedicel with ovary 6-15 mm long; dorsal sepal narrowly ovate, 3-3.5 mm long, 3-nerved; lateral ones reflexed, falcate, 4-4.5 mm long, obtuse, 3-nerved; petals oblong, about 3 mm long, 2-nerved; lip broadly linear, 5-7 mm long with a oblong callus at the base; spur slender, 15-20 mm long, curving sideways or downwards. Column 1.5 mm across, the front parts of colum base slightly extending and curving inwards. Anther loculi parallel; connective narrow; pollinarium 2 mm long; viscidium narrowly deltoid, incurved, slightly covered by rostellum; staminodes not conspicuous. Rostellum concave, curved into a V shape. Stigmatic surfaces slightly protruded.

Occurrence: Yushan (KAWAKAMI et SASAKI s.n., Oct. 25, 1909, 2800 m, TI, Type of *P. longibracteata* and isotype in TAIF; MORI s.n., Dec. 1909, TAIF; J. OHWI 3702, July 6, 1933, KYO; J. OHWI 3858, July 9, 1933, KYO); Taichung, Nen-kouyu (J. OHWI 3971, June 13-15, 1933, KYO, Isotype of *P. transnokoensis*); Nan-hu-ta-shan (LIN 170, Aug. 10, 1974, TAIF); Ya-kou (LIN 445, July 15, 1979, 2600

m, TAIF); Alishan (J. OHWI 3605, July 4, 1933, KYO); Pianan (J. OHWI 2795, June 6, 1933, KYO, pro parte).

Distribution: Japan, Sachalin, S. Kuril.

Flowering seasons: July-August.

We have studied the isotype of *P. transnokoensis* of OHWI 3971 (in KYO). The flowers have the characteristics of a callus at the base of lip, falcate lateral sepals and strongly incurved viscidium. The mentioned characters can be only found in *P. sachalinensis* of *Platanthera* in Taiwan.

As to another name *P. longibracteata*, the plants of the type specimen (holotype & isotype) are in a stage of fruit and it is very difficult to investigate the column structure in details, but the lateral sepals of dissected flower and the flower sketch in holotype show falcately deltoid just as the *P. sachalinensis* does. Therefore we unite it with *P. sachalinensis*.

This species is not common, but is sporadically distributed in alpine mountain, usually at an altitude of 2300-2800 m. It grows on the open grassy lands.

5) *Platanthera yangmeiensis* T. P. LIN, sp. nov. (Fig. 6).

Sinker fusiform; new shoot initiating near the stem base. Plant 22-40 cm tall, slender, with one or two unequal large leaves at the ground level and several small ones along its lengths. Basal leaf elliptic-oblong, up to 15X5 cm, the leaf base gradually reduced into a sheath. Inflorescence remotely 5-8 flowered. Bracts lanceolate, 8-30 mm long, the lower ones longer than the pedicel with ovary 12-15 mm long; dorsal sepal concave, rounded, obtuse, 4.5X3.5 mm; lateral ones reflexed, linear-falcate, acute, 6.5X1.8 mm; petals obliquely deltoid, round on front, acuminate, 5.5X1.8 mm, connivent with the dorsal sepal forming a hood; lip broadly linear, 7X1.6 mm, turning downwards; spur slender,

Rhizoma brevis; tuber fusiforme. Folia infima maxima, elliptico-oblongata, usque ad 15 cm longa, 5 cm lata, supra in squamas lanceolatas abrupte abeuntia. Flores flavi vel chlorascentes; sepalum dorsale concavum, rotundatum, obtusum, 4.5 cm longum, 3.5 cm latum; sepala lateralia reflexa, lineato-falcata, acuta, 6.5 mm longa, 1.8 mm lata; petala conniventia cum sepalo dorsali, oblique deltoidea, acuminata, 5.5 mm longa, 1.8 mm lata; labellum late lineare, 7 mm longum, 1.6 mm latum; calcar gracile, 1.7-2.3 cm longum, quam pedicellis cum ovario longiore, arcuatum.

1.7-2.3 cm long, arcuate, usually parallel with the pedicel. Column about 3 mm across. Anther loculi parallel; connective wide; pollinarium ca. 3 mm long; viscidium naked, orbicular; caudicle slender; staminodes conspicuous. Rostellum concave. Stigmatic surfaces flat and confluent.

Occurrence: Yangmeishan, Miaoli County (LIN 280, July 13, 1975, 1200 m, Type in TAIF); Ra-ra-shan (LIN 287, Aug. 30, 1974, 1200 m, TAIF); Jur-lu-shan (LIN 375, July 18, 1976, 1000 m, TAIF); Nan-chia-tien-shan (LIN 449, Oct. 1979, 1400-1700 m, TAIF).

Distribution: Endemic.

Flowering seasons: June-August.

The plants grow along the path near mountain ridge under the wood on the leeward and at an altitudes from 1000 m up to 1700 m.

P. minor more or less resemble *P. yangmeiensis*; however, they can be distinguished from the following characters:

P. minor

Basal leaf: attaching stem basis
Lateral sepals: round at tip
Sinker: ellipsoid
Anther loculi: divergent
Spur: slightly longer than pedicel with ovary

P. yangmeiensis

Basal leaf: attaching lower stem
Lateral sepals: acute
Sinker: fusiform
Anther loculi: parallel
Spur: much longer than pedicel with ovary

6) *Platanthera minor* (MIQ.) REICHB. f. in Bot. Zeit. 36: 75 (1878); SCHLTR. in Fed. Repert. Beih. 4: 114 (1919). (Fig. 7).

Habenaria japonica A. GRAY var. *minor* MIQ. in Ann. Mus. Bot. Lugd. Bat. 2: 207 (Profl. Fl. Jap. 139) (1865-1866).

Platanthera interrupta MAXIM. in Bull. Acad. Sci. St.-Pet. 31: 106 (1886).

Platanthera sigeyosii MASAMUNE in Bot. Mag. Tokyo 46: 773 (1932); YING, Col. Ill. Ind. Orch.

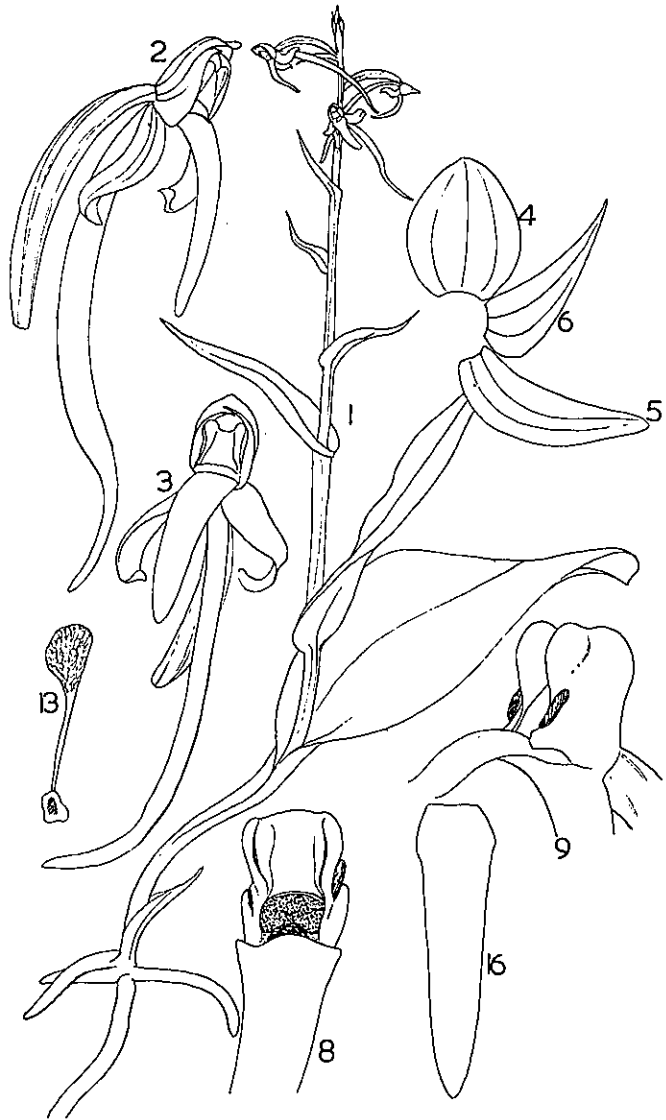


Fig. 6. *Platanthera yangmeiensis*

Taiwan 1: 363, 493 (1977); LIU et SU in Fl. Taiwan 5: 4094 (1978), syn. nov.

Sinker ellipsoid; new shoot initiating near the stem base. Plant 25-35 cm tall. Large leaves one or two, the lowest oblong or narrowly oblong, 7-12X2-3.5 cm; the upper ones gradually grow small and narrow. Inflorescence 10-15 cm long, subdensely 7-20 flowered. Bracts lanceolate, 6-14 mm long, the lower ones usually longer than the pedicel with ovary. Flowers greenish; pedicel with ovary 8-12 mm long; dorsal sepal broadly ovate, 4-5 mm long, 3-nerved; lateral ones markedly spreading and reflexed, narrowly

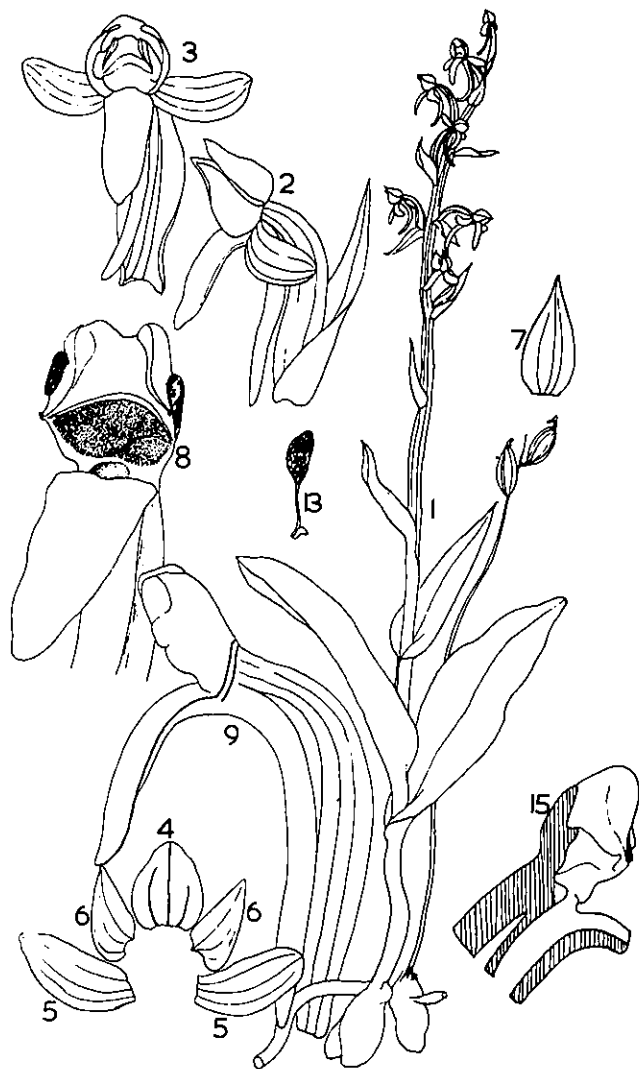


Fig. 7. *Platanthera minor*

oblong, 6-7 mm long, 3-nerved; petals connivent with the dorsal sepal, obliquely ovate, 2-nerved; lip broadly linear, whitish, obtuse, 5-7 mm long; spur 12-15 mm long, curving downwards. Column ca. 3.3 mm across. Anther loculi divergent; connective wide; pollinarium 2.5 mm long; viscidium naked, suborbicular; caudicle long. Rostellum concave, curved. Stigmatic surfaces flat and confluent.

Occurrence: Shikayantaizan (SUZUKI s.n., July 9, 1930, TAI, Type of *P. sigeyosii*); Ran-ta-shan (s.n., Oct. 1913, TAIF); Ta-pa-jian-shan (LIN 370, July 2, 1976, 2800 m, TAIF); Pei-chia-tien-

shan (LIN 169, July 2, 1974, 1600 m, TAIF); Nanhutashan (SU s.n., July 1972, NTUF); Tsuchiyountashan (SUZUKI s.n., July 1930, NTUF); Pianan, Taichung (J. OHWI 2819, June 6, 1933, KYO).

Distribution: Japan, Korea, China (Kwangtung, Kiangsu, Cheking, Hunan and Yunnan).

Flowering seasons: June-August.

We have examined the type of *P. sigeyosii* in TAI, but can't see how we can maintain it separate from *P. minor*. Another specimen identified as *P. sigeyosii* by OHWI in KYO (J. OHWI 2819) also corresponds with *P. minor* of Japan.

This orchid usually grows on sloping ground of alpine meadow and occurs in above 2000 m in the field.

7) *Platanthera stenoglossa* HAYATA, Ic. Pl. Formos. 4: 123 (1914) et 6: 93 (1916); SCHLTR. in Fed. Repert. Beih. 4: 117 (1919); YING, Col. Ill. Ind. Orch. Taiwan 1: 493 (1977); LIU et SU in Fl. Taiwan 5: 1094 (1978). (Fig. 8).

Platanthera stenosepala SCHLTR. in Fed. Repert. Beih. 4: 44 et 117 (1919); YING, Col. Ill. Ind. Orch. Taiwan 1: 293, fig. 131 (1977); LIU et SU in Fl. Taiwan 5: 1094 (1978), syn. nov.

Platanthera iriomotensis MASAMUNE in Trans. Nat. Hist. Soc. Formos. 24: 279 (1934), syn. nov.

Sinker fusiform; new shoot initiating near the stem base. Plant up to 30 cm tall. Large leaf one, basal, inserted with right angle to the stem, elliptic or ovate-elliptic, acute, about 9X3 cm. Inflorescence subdensely 3-15 flowered. Bracts lanceolate, 6-14 mm long, mostly shorter than the pedicel with ovary. Flowers yellowish green or light green; pedicel with ovary 9-14 mm long; dorsal sepal deltoid, 5X3 mm, 1-nerved; lateral ones strongly reflexed, linear, obtuse, about 7X1.5 mm, 1(-3)-nerved; petals obliquely deltoid, from tip to base about 4 mm long, 3.7 mm across the base, acute, 2-nerved, with the ends free from the dorsal sepal and open widely; lip fleshy, linear, 7 mm long; spur arcuate, linear, 1.5 cm long. Column 3 mm

Fig. 8. *Platanthera stenoglossa*

across. Anther loculi parallel and distant each other; connective wide; pollinarium 2.5 mm long; viscidium naked, suborbicular; caudicle 2 mm long; staminodes conspicuous. Rostellum concave. Stigmatic surfaces flat and confluent.

Occurrence: Schichiseitonzan (KAWAKAMI et SHIMADA s.n., July, 1910, Type of *P. stenoglossa* in TI); Rankanzan (B. HAYATA s.n., May 10, 1915, TAIF); Chihsingshan (SU 619, NTUF); Taipei-Hsien, Hsiaokotou (K. INOUE s.n., Mar. 27, 1977, TI).

Distribution: Ryukyu.

Flowering seasons: March-May.

This species is widely distributed on the island of low land, usually not higher than 700 m. From the type of *P. stenoglossa*, the specimen shows one large leaf and its flower characters are identical with *P. stenosepala*. It is no doubt to merge the name *P. stenosepala* and choose the former as the species epithet.

8) *Platanthera mandarinorum* REICHB. f. subsp. *pachyglossa* (HAYATA) T. P. LIN et K. INOUE, stat. nov. (Fig. 9).

Platanthera pachyglossa HAYATA, Ic. Pl. Formos. 4: 123, t. 21 (1914); YING, Col. III. Orch. Taiwan 1: 291, 364, fig. 130 (1977).

Platanthera angustata sensu GARAY et SWEET non LINDL., Orch. S. Ryukyu Isl. 32 (1974); LIU et SU in Fl. Taiwan 5: 1092 (1978).

Sinker fusiform; new shoot initiating near the stem base. Plant up to 50 cm tall. Large leaves one or two, oblong or elliptic, up to 8X3 cm. Inflorescence laxly or sublaxly 5-13 flowered. Bracts ovate-lanceolate, 6-20 mm long, equalling or shorter than the pedicel with ovary. Flowers

usually facing downwards, greenish; pedicel with ovary 11-20 mm long, curved; dorsal sepal broadly ovate, concave, up to 6X6 mm, 3-nerved; lateral ones reflexed, obliquely oblong-lanceolate, acuminate, up to 8.5X3.5 mm, 3-nerved; petals obliquely and broadly ovate-lanceolate, pointing outwards at the ends, subfalcate, longer than dorsal sepal, 6 mm wide, 2-3-nerved; lip fleshy, linear-lanceolate, acuminate, about 10X2 mm; spur curving downwards, linear, about 1.3 cm long. Column 4 mm across. Anther connective wide; loculi parallel; pollinarium 3.8 mm long; viscidium naked, suborbicular; caudicle 2.2

mm long; staminodes conspicuous. Rostellum curving into a U or V shape. Stigmatic surfaces flat and confluent.

Occurrence: Ran-ta-shan (KAWAKAMI et MORI s.n., Aug. 9, 1907, TAIF); Li-tung-shan (KAWAKAMI s.n., July 15, 1913, TAIF); Ta-pa-jian-shan (LIN 372, July 2, 1976, 3000 m, TAIF); Ali-shan (SASAKI s.n., May 17, 1932, TAI; U. FAURIE 922, June 1914, KYO; J. OHWI 3473, July 3, 1933, KYO, pro parte; J. OHWI 3639, July 4, 1933, KYO; H. ITO s.n., May 30, 1936, TI); Tai-pin-shan (SASAKI s.n., May 17, 1932, TAI; HUANG s.n., Sep. 1, 1973, TAI); Nan-hu-ta-shan (J. OHWI 2586, June 1, 1933, KYO; J. OHWI 4071, July 19-20, 1933, KYO); Shuei-shan (SASAKI s.n., July 23, 1932, TAI); Peitawushan (NAMBA et al. 2957, July 19, 1968, TI, pro parte); Nen-kouyu (J. OHWI 3203, June 13-15, 1933, KYO); Nenkao Chiin, Tzue-fun (K. SEGAWA s.n., June 13, 1935, TI); Ya-kou (LIN 444, July 17, 1979, 2600 m, TAIF); Yi-chu-shan, Chintsu (SASAKI s.n., July 18, 1932, TAI).

Distribution: Endemic.

Flowering seasons: June-August.

This species is rather common on the alpine mountains. It is distributed to the top altitude of Taiwan *Platanthera*. *P. pachyglossa* was combined with *P. angustata* by GARAY and SWEET (1974) but in our opinion, *P. pachyglossa* belongs to *P. mandarinorum* group of China and Japan. According to the specimens deposited in KYO and SEIDENFADEN (1977), *P. angustata* of Java, Borneo and Thailand has a very short and small basal leaf. As to the flower, *P. angustata* has a ovate-lanceolate dorsal sepal which is different from *P. pachyglossa*. The most prominent difference between them is that *P. angustata* with the dorsal sepal and petals overlapping and forming a hood (also found in SMITH, 1908; HOLTUM, 1957), while *P. pachyglossa* with the free ends of petals widely opened.

From the examinations of the specimens which are deposited in TI by the junior author, he thinks this plant is similar to var. *maxim-*

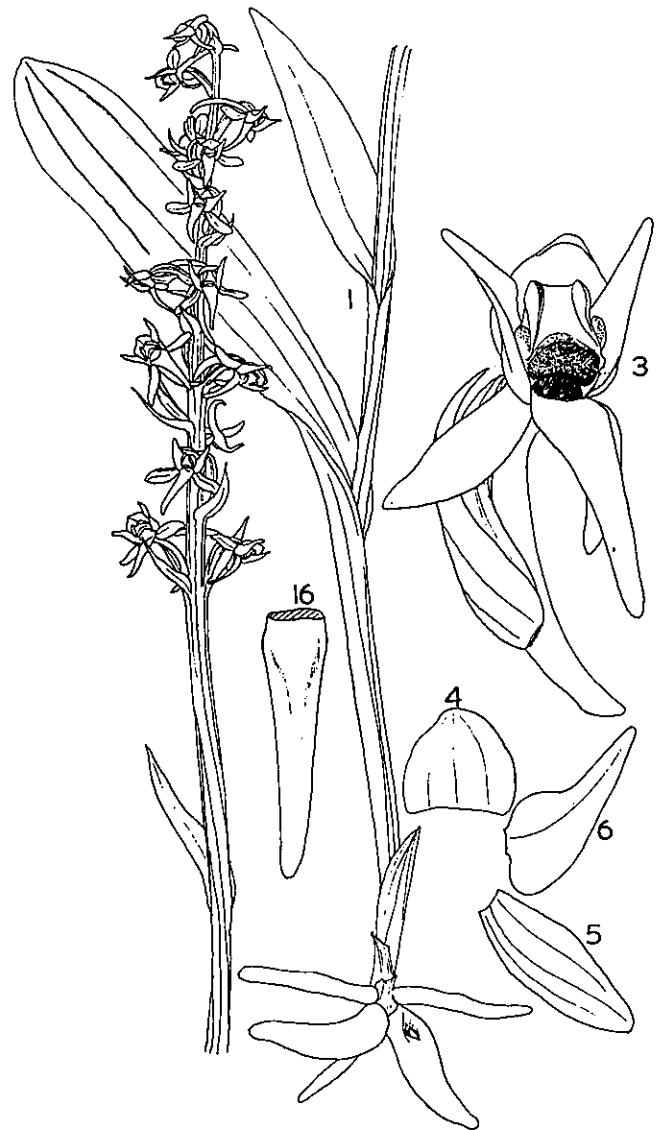


Fig. 9. *Platanthera mandarinorum* subsp. *pachyglossa*.

owicziana, *brachycentron*, and *mandarinorum* of Japan, but still can be separated by the characters of petal and leaf shapes, spur length and direction.

He distinguished subsp. *mandarinorum* and subsp. *pachyglossa* by the following features:

subsp. *mandarinorum*

Spur: upturned or sideways, 2-3 cm long

Leaf: linear, 6-8 cm long, 15 mm wide

Anther: loculi divergent.

subsp. *pachyglossa*

spur: curved downwards, about 1.3 cm long.

Leaf: broader

Anther: loculi parallel

9) *Platanthera mandarinorum* REICHB. f. subsp. *formosana* T. P. LIN et K. INOUE, subsp. nov. (Fig. 10).

Sinker fusiform; new shoot near the stem base. Plant up to 25 cm tall, with angular stem. Basal leaf lanceolate or ovate-lanceolate, acuminate, about 6X1.2 cm; the upper leaves decreasing in size to scales towards inflorescence. Inflorescence laxly 7-10 flowered. Bracts lanceolate, 9-13 mm long, mostly shorter than the pedicel with ovary. Flowers greenish; pedicel with ovary 10-17 mm long; dorsal sepal deltoid, obtuse, 8X6 mm, 3-nerved; lateral ones obliquely linear, acuminate, reflexed, 10X2 mm, 3-nerved; petals obliquely deltoid, pointing outwards at the free ends, 2-nerved; lip lanceolate, 1.2 cm long, about 3.5 mm wide; spur curving downwards, linear, up to 1.8 cm long. Column 4.5 mm across. Anther loculi divergent, separated; connective wide at the base and narrowed towards the apex. Pollinarium 4.3 mm long; viscidium naked, suborbicular; caudicle 2.1 mm long; staminodes conspicuous. Stigmatic surfaces flat and confluent. Rostellum curving and forming a V shape.

Occurrence: Chi-lan-shan (LIN 223, May 7, 1975, 1200 m, Type in TAIF); Pei-chia-tien-shan (LIN 145, July 2, 1974, 1600 m, TAIF).

Distribution: Endemic.

Flowering seasons: May-July.

How to arrange this plant into a suitable position has been puzzling us for a long time. This plant grows in an open grassy slope of above 1200 m, and its flower has deltoid dorsal

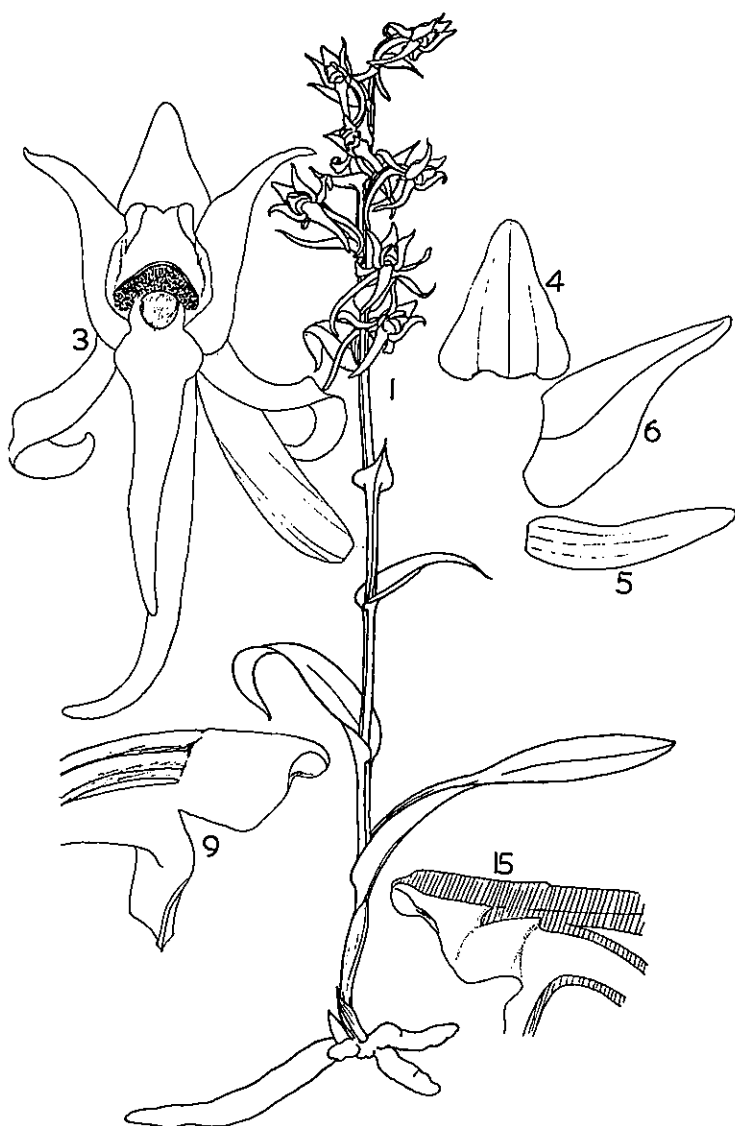


Fig. 10. *Platanthera mandarinorum* subsp. *formosana*

sepal, divergent anther loculi and conspicuous staminodes. Based on the mentioned characters, we considered this plant should be a member of *P. mandarinorum*. Taiwanese plants seem to be the most akin to *P. mandarinorum* var. *brachycentron* of Japan, but they are different in the shape of dorsal sepal and leaf. Therefore, we treat this plant as another subspecies of *P. mandarinorum*, that is, subsp. *formosana*. Dis-

Folia infima amplexicaulia, lanceolata vel ovato-lanceolata, acuminata, 6 cm longa, 1.2 cm lata. Flores chlorascentes; sepalum dorsale deltoideum, obtusum, 8 mm longum, 6 mm latum; sepala lateralia reflexa, oblique linearia, acuminata, 10 mm longa, 2 mm lata; petala oblique deltoidea, 6.5 mm longa, 3.5 mm lata; labellum lanceolatum, 12 mm longum, 3.5 mm latum; calcar arcuatum, usque ad 1.8 cm longum.

inction between subsp. *pachyglossa* and subsp. *formosana* is clear in the points of habitats and shapes of dorsal sepal and leaf.

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鳴橋直弘：ベニバナイチゴとサーモンベリー

N. NARUHASHI: *Rubus vernus* FOCKE and *R. spectabilis* PURSH

北海道西南部から本州中部にかけて分布し、主に日本海側の積雪地帯の亜高山帯から高山帯に見られるベニバナイチゴは、最初北米産のサーモンベリーと同じと考えられ、学名として *Rubus spectabilis* が使用されていた。ところが、1877年に FOCKE はこの植物は北米のものとは別種であると考え、*R. vernus* と名づけた。その後、1911年に彼はそれら 2 種は亜種関係にあるとし、*R. spectabilis* subsp. *vernus* と組変えをおこなった。日本のバラ科のモノグラフの中で、小泉源一博士はこの結果を支持した。

これら 2 分類群の形態的差については、FOCKE のキイチゴ属のモノグラフと原寛博士の北米植物の比較に述べられている。

筆者は、上記のことやアメリカのフローラ関係の文献や日本の標本庫にある標本から、類似するベニバナイチゴとサーモンベリーが別種か同一種かという問題には少なからず関心をいただいていた。

本年 7 月チャンスがあって、カナダのバンクーバーやバンクーバー島、アメリカ合衆国のアヤラック、およびレーニア山でサーモンベリーの花や果実を観察することができた。

茎が 2 年以上生きていることをはじめ、多くの形態的類似性があり、従来いわれているようにこれら 2 分類群は系統的に最も近い関係にあると筆者も推測したが、同時に次の点に差違をみた。ベニバナイチゴに比べ、サーモンベリーは分布域が広く、また、生育環境も海岸近くから高山中腹までの多湿な樹林下から斜面向陽地と多様で、形態的変異に富んでいた。果実の色も生育地の多くで、黄、オレンジ、赤と混在していた。低地では 2 m 以上にもなり、長く伸長した枝はやや開出し、植物体は大型となっていた。果実の大きさはやや小さいと思われたが、筆者にはよく目についた。なんといっても、枝にとげのある点は、大きな区別点である。

以上の形態的形質の差もさることながら、生育地の差、つまり、日本のベニバナイチゴよりはるかに低地に分布し、共存する植物が違っていることから、多くの日本の学者同様、筆者も別種関係であるという考えを支持するものである。