

Two Unrecorded Taxa of Korean *Polygonatum* (Liliaceae): *P. odoratum* Druce var. *odoratum* and *P. acuminatifolium* Kom.

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Two unrecorded taxa of *Polygonatum* (Liliaceae), *P. odoratum* var. *odoratum* from Isl. Pungdo, Ansan-shi, Kyonggi Province and *P. acuminatifolium* from Mishiryong, Kangwon Province were reported. The morphological difference between *P. odoratum* var. *odoratum* and *P. odoratum* var. *pluriflorum* includes distribution patterns of papillae on the filament surface.

Polygonatum Mill. comprises ca. 50 species, and approximately 40 of them are distributed in eastern Asia (Tang, 1978; Jeffrey, 1980; Jang, 1998). The major distinguishing characters for the genus include phyllotaxis (Baker, 1875; Abramova, 1975; Jang, 1998), size of perianth (Tang, 1978; Jang, 1998), base chromosome numbers (Abramova, 1975; Tamura, 1990; Jang, 1998), and the presence or absence of bracts (Franchet and Savatier, 1878; Komarov, 1935; Satake, 1942; Jeffrey, 1980; Jang, 1998). The genus *Polygonatum* has been divided into sects. *Polygonatum*, *Oppositifolia* Baker and *Verticillata* Baker based on phyllotaxis and basic chromosome numbers (Abramova, 1975; Tamura, 1990; Jang, 1998). Section *Polygonatum* is characterized by its alternate leaves and base chromosome numbers of $x=9$, 10, and 11. This section has been further divided into four series including ser. *Polygonatum*, *Bracteata* Kom. ex Abramova, *Inflata* (Satake) Tamura, and *Alte-lobata* Tang based on several characters such as the presence or absence of bracts, ratio of perianth lobe/perianth and base chromosome numbers. *Polygonatum odoratum* Druce, the type of ser. *Polygonatum*, is distributed worldwide, and this has not been reported in Korea except *P. odoratum* var. *pluriflorum* Ohwi. We found a population of *P. odoratum* var. *odoratum* during the field survey from Isl. Pungdo, Ansan-shi, Kyonggi Province, which differs from *P. odoratum* Druce and *P. odoratum* var. *pluriflorum* Ohwi.

Series *Inflata* is distinguished from the other series within sect. *Polygonatum* in having membranous, deciduous bracts, base chromosome number of $x=11$, and

pendulous peduncles. This series comprises two species, *P. inflatum* and *P. acuminatifolium* (Jang, 1998). The former is distributed widely in northeast Asia including Korea, while the latter is restricted to Manchuria only. In this study, *P. acuminatifolium* was found at Mishiryong, Kangwon Province, and recorded first in Korea.

Materials and Methods

Two unrecorded taxa, *P. odoratum* var. *odoratum* and *P. acuminatifolium*, were collected from Isl. Pungdo, Ansan-shi, Kyonggi Province and Mishiryong, Kangwon Province, respectively. Vouchers for these taxa were deposited at Chungbuk National University Herbarium (CBU) and Korea University Herbarium (KUS). The comparative morphological study was conducted using dried specimens of *P. odoratum* [D. E. Mayer 105 (B)] and *P. acuminatifolium* [holotype: USSR, Primor'ye, R. Suputinka valley, Komarov 170 (LE)]. A dissecting microscope with a drawing tube and a scanning electron microscope were used for the morphological study.

Descriptions

Polygonatum odoratum Druce var. *odoratum*

Robust perennial herb; rhizome creeping, horizontal, stout, terete, 2- or 3- branched, internode 7.2-11.6 mm in diameter; stem ascending above, angulate, glabrous, 0.5-1.1 m tall. Leaves 12-16, alternate, elliptical to oblong, 11.5-19.0 cm \times 3.5-7.5 cm, acute at the apex, obtuse to attenuate at the base, glabrous on veins beneath and leaf margin; petioles subsessile. Inflorescences axillary, racemose, 2-flowered, rarely 1- or 3-flowered peduncles arcuate or deflexed, 2.4-5.5 cm long; pedicels

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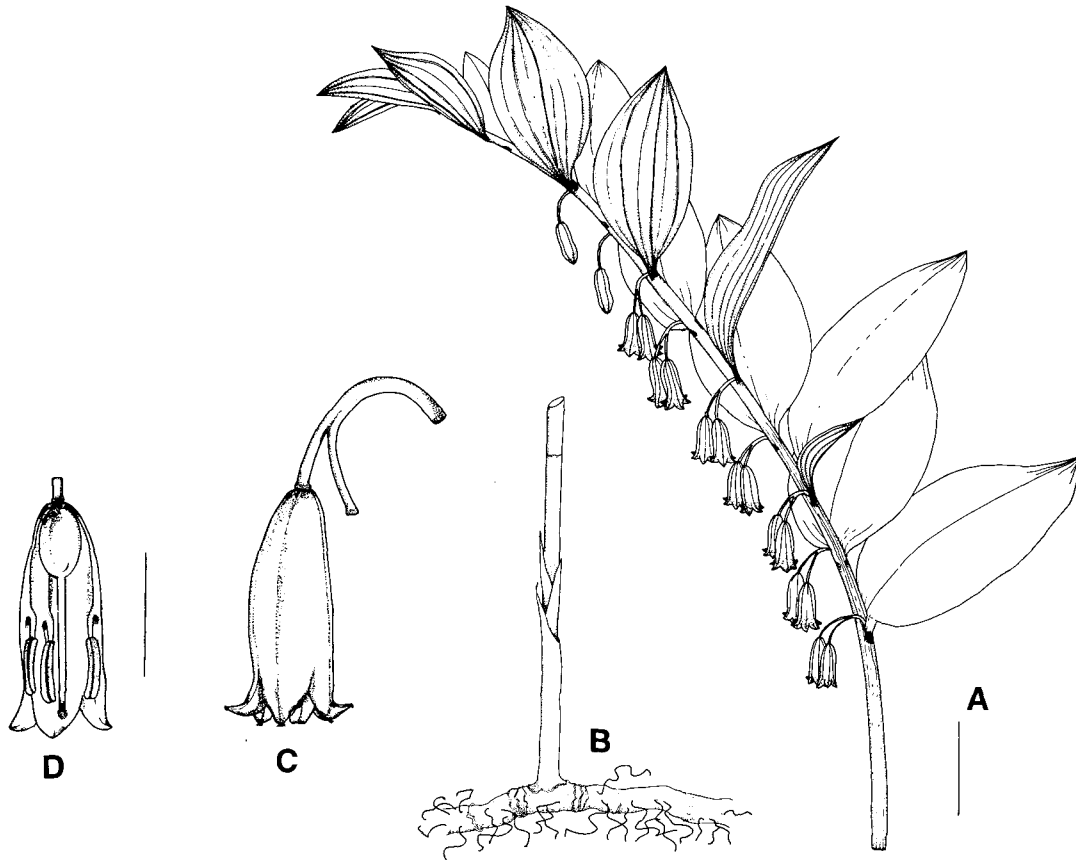


Fig. 1. *Polygonatum odoratum* var. *odoratum* (B. Oh et al. 96003). A, Habit. B, Rhizome. C, Perianth. D, Ongitudinal section of perianth. Scale bars=1 cm (C, D) and 5 cm (A, B).

thinner than peduncles; bract absent. Flowers yellowish white, pendulous; perianth urceolate, 1.5-2.3 cm long, 3.1-7.3 mm wide; perianth lobes, greenish, extrose, saggitate; stamens inserted in middle part of perianth tube; filaments cylindric, slightly S-shaped, glabrous, 2.6-4.3 mm long; anthers included, 4.0-6.0 mm long; pistil filiform; style 1.1-1.6 mm long, about 2 times longer than ovary; stigma 3-furcated, above to anther; ovary 4.5-6.8 mm in diameter. Fruits, berry, globose, 0.7-1.3 cm in diameter. 3-loculed, with many ovules, but usually 5-seeded, green, black in maturity. Flowers in May (Fig. 1).

Korean Name : Pungdo-tung-kul-rae nom. nov. (Fig. 1)

Additional specimens examined : KOREA. Kyonggi Province, Ahansan-shi, Is. Pungdo, 11 May 1996, B. Oh et al. 96003

Polygonatum odoratum var. *odoratum* is distinguished from *P. odoratum* var. *pluriflorum* by its glabrous filaments (Ohwi, 1953, 1965). Plants collected from Isl. Pungdo have glabrous filaments, and clearly distinguished from those of *P. odoratum* var. *pluriflorum* in Korea (Fig. 2).

Polygonatum acuminatifolium Kom., Bull. Jard. Bot. Petesrb. 16: 157 (1916). Type: USSR, Primor'ye, R. Suputinka valley, Komarov 170 (holotype LE)

Polygonatum quinquefolium Kitagawa, in Rep. Inst. Sc. Res. Manch. 4: 79, tab. 2, fig. 1 (1940). none vidi. Type: China, Manchuria, Chilui Prov. Kitagawa (holotype TI). syn. nov.

Small herb; rhizome creeping, thin, terete, internode 2.1-2.7 mm; stem arcuate upper part, terete, 12.5-31.5 cm tall. Leaves alternate, elliptical, 6.5-8.5 × 3.2-3.7 cm, acute to acuminate at the apex, obtuse or round at the base, glabrous on the veins beneath and leaf margin; petioles 12 cm long. Inflorescences axillary, 2-flowered, rarely 3-flowered; peduncles 1.5-2.2 cm long; pedicels similar to peduncle; bracts borne at base of pedicels, lanceolate, membranous, 3.6-8.2 mm long. Flowers pendulous; perianth tubular, yellowish, 1.8-2.4 cm long, 4.9-8.3 mm wide; perianth lobes recurved, rounded; stamens inserted on upper part of perianth tube; filaments flattened, slightly S-shaped, papillose on whole surface, with trichomes on middle and lower parts, 2.4-5.0 mm long; anthers included, 3.0-4.1 mm

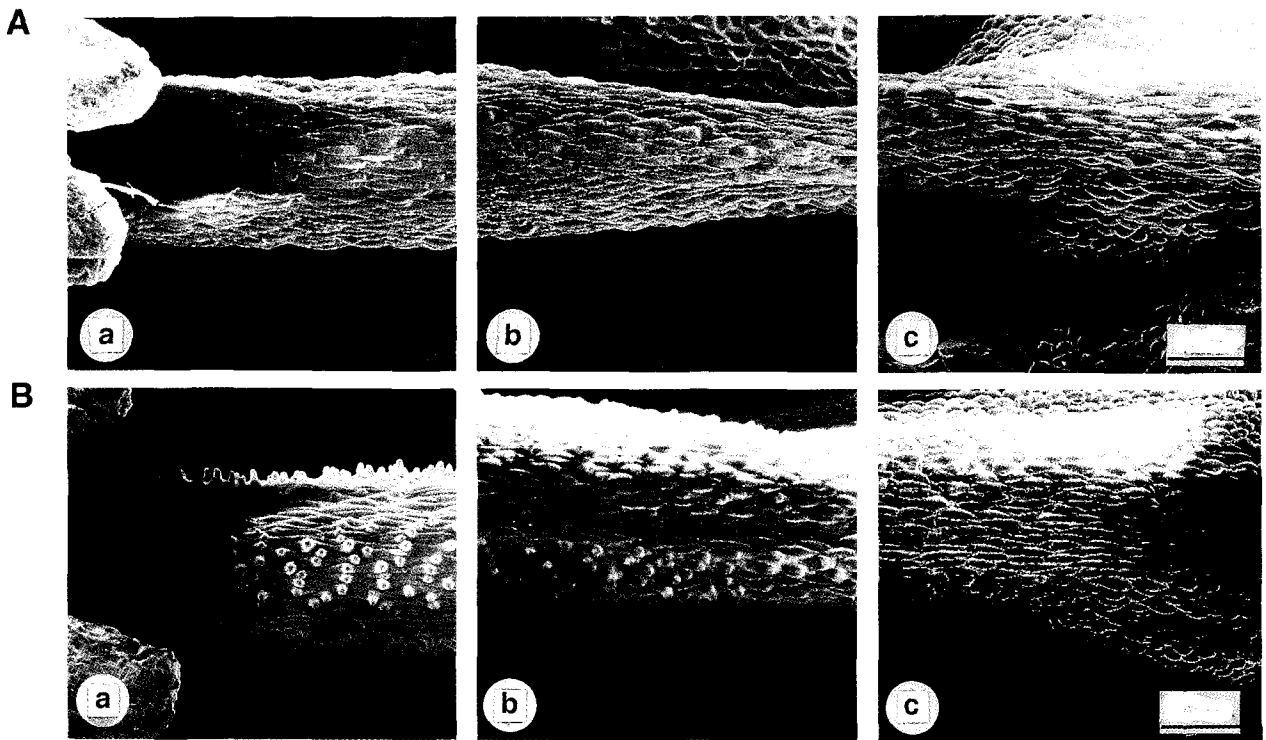


Fig. 2. The filament surface of *polygonatum*. A, *P. odoratum* var. *odoratum*. B, *P. odoratum* var. *pluriflorum* (Miq.) Ohwi. Upper part of filament (a). Middle part of filament (b). Lower part of filament (c). Scale bars=200 μ m.

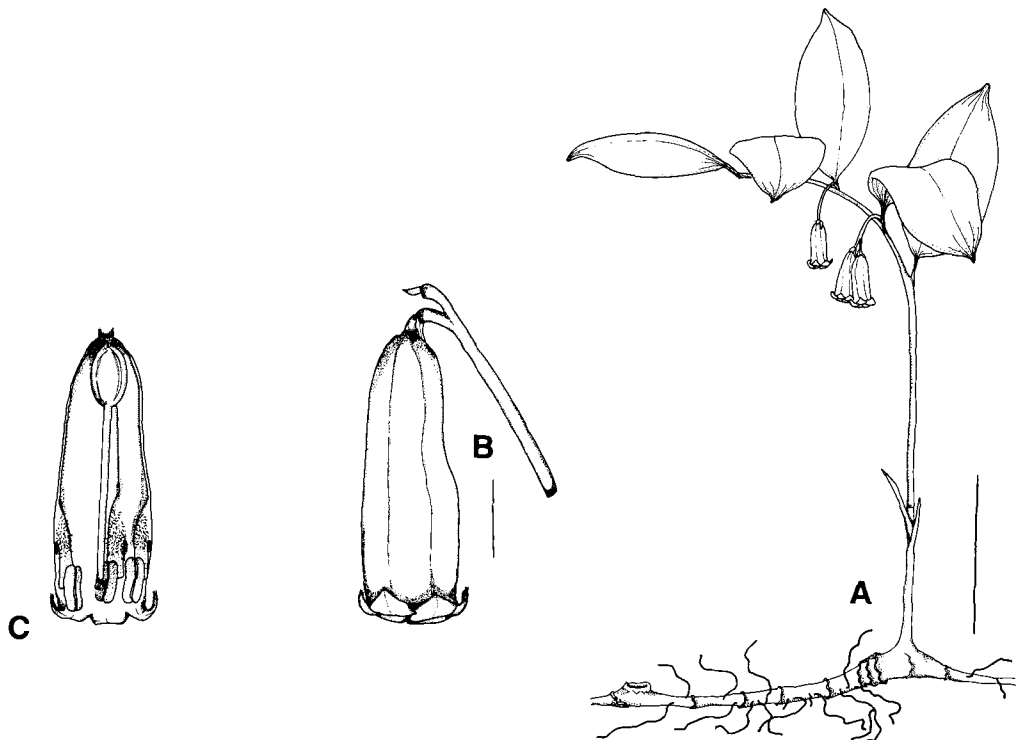


Fig. 3. *Polygonatum acuminatifolium* Kom. (B. Oh et al. 96010). A, Habit. B, Perianth. C, Longitudinal section of perianth. Scale bars=5 mm (B, C) and 5 cm (A).

long; pistil 1.2-1.6 cm long; style 3 times longer than ovary; stigma flattened, below the anther; ovary 4.3-6.8 mm in diameter. Fruits, berry, globose, 3-loculed with many ovules, but usually 3-seeded, green, black at maturity. Flowers in June-July (Fig. 3).

Korean Name : Chong-tung-kul-rae nom. nov. (Fig. 3)

Additional specimens examined: KOREA. Kangwon Province, Mt. Solaksan, Mishiryong, 6 Jun 1996, C.G. Jang 96010 (CBU); 13 May 1996, B.U. Oh et C.G. Jang 96014 (KUS); 6 Jun. 1996, B.U. Oh et C.G. Jang 96058 (KUS); 20 Jun. 1996, B.U. Oh et C.G. Jang 96059 (CBU).

Polygonatum acuminatifolium was included in ser. *Infalta* of sect. *Bracteatae* with *P. inflatum*. Series *Infalta* is characterized by many morphological features including thin rhizomes, pendulous long peduncles, membranous bracts at the base of pedicels, flattened and pubescent filaments, pubescent inner surfaces of perianth, and recurved perianth lobes. This species differs from *P. inflatum* by height, the numbers of leaves, perianth color, and distribution pattern of papillae and trichomes on filament surfaces. *Polygonatum quinquefolium* Kitagawa is identical to *P. acuminatifolium* in morphology except for slight differences in flower color and shape of perianth lobes (Kitagawa, 1940; Tang, 1978; Komarov, 1935), and therefore, it is treated here as a synonym of *P. acuminatifolium*.

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