



A new Solomon's Seal (*Polygonatum*: Asparagaceae) from northern Thailand

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Polygonatum Miller (1754, without pagination) (Asparagaceae) is a relatively large genus containing approximately 60 taxa (Chen & Tamura 2000). The majority of species are eastern Asian (Jeffrey 1980, Chen & Tamura 2000). Phyllotaxy, cytology, and filament morphology have been recognized as important in delimiting species (Suomalainen 1947, Tamura 1990, 1991, 1993). Specimens of an anomalous *Polygonatum* collected by J.F. Maxwell from northern Thailand, Doi Inthanon have a general affinity to *P. punctatum* Royle ex Kunth (1850: 142) and have been reported as that species (Tamura 1993, Maxwell 1998), but differ in their emaculate white and longitudinally ridged perigone. Cultivated material from the same locality (BSWJ6599, Figs. 1–2) provides clear observation of the differences that are not as apparent on pressed specimens. It differs in several morphological features from *P. punctatum*: stem characters; phyllotaxy; leaf shape; inflorescence type and position; perigone color; and filament size, orientation, and morphology. The combined morphological differences and non-contiguous distributions of *P. costatum* in comparison to *P. punctatum* support its recognition as a new species, thus far documented only from the highest elevation in northern Thailand.

In Thailand only three species of *Polygonatum* have been reported; the verticillate *P. kingianum* Collett & Hemsley (1890: 138) from the north and northeastern limestone regions, the verticillate *P. tessellatum* Wang & Tang (1936: 85) from Doi Chiang Dao, and *P. punctatum* from Doi Inthanon (Tamura 1993, Maxwell 1998, Chen & Tamura 2000). During examination of specimens from CAS, F, HUH, MICH, MO, NY, P, PE (acronyms following Thiers 2014) no specimens of *P. punctatum* have been observed from Thailand and it should be excluded from the flora. In fact, the geographically closest specimens observed of *P. punctatum* are from Bhutan.

Description of the new species

Polygonatum costatum Floden *sp. nov.* (Fig. 1)

Differs from *P. punctatum* Royle ex Kunth in the whorled leaves at mid-stem; emaculate, non-urceolate, generally larger perigone, costate ridges of the perigone due to the raised areas where the filaments are connate within the tube; and the filaments longer. It also differs from *P. tessellatum* F.T.Wang & Tang in its shorter perigone, shorter filaments and anthers, as well as having multiple-flowered, pedunculate inflorescences (vs. single-flowered and fascicled). It is similar to both species in its erect infructescences, red fruit, and evergreen habit.

Type:—THAILAND. Chiang Mai Province: Java Tong District, summit area Doi Inthanon National Park, 2560 m, 24 May 1990, J.F. Maxwell 90-559 (holotype, BKF!; isotypes CAS!, HUH!, MO!)

Plants perennial, evergreen. Rhizomes moniliform to torulose, green, densely fleshy rooted, 1–2 cm in diameter. Stem 30–50 cm tall, red maculate, cataphylls caducous, outermost ovate, inner lanceolate, apex obtuse, chartaceous. Leaves alternate to opposite proximally, 3–4 verticillate distally and at apex, 6–10 × 1–3 cm, oblanceolate, apex long acuminate, margin entire, glabrous, abaxially red maculate on midrib. Inflorescences 1 per leaf, 1–4-flowered, peduncles 5–10 mm long, pedicels 5–15 mm long, red maculate, bracteoles minute. Perigone cylindric, inflated distally around the point of filament insertion, distinctly costate on tube, 3 mm wide at pedicel, 4 mm wide near lobes, 8–10 mm long, white, lobes green, 2–3 mm long; filaments inserted near middle of perigone, 1–1.2 mm long, tapered distally, smooth to roughened, but not papillose, with a gibbous protrusion near anther attachment, anthers 1.5–2 mm long; ovary 2.5–2.7 mm long, style 2.2–2.7 mm long not surpassing the anthers; fruit red, ca. 1 cm diam., peduncles erect in fruit. Seeds ca. 1.5 mm, ovoid, tan.

Chromosome number:— $2n = 30$. See Tamura (1993) who reported this count and its karyotype from plants from Doi Inthanon. In comparison to other members of the *P. punctatum*-group this species lacks a secondary constriction on the longitudinal pair (see Floden 2014).