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## A New Species in *Potentilla* Section *Leptostylae* (Rosaceae) from Yunnan, China

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**ABSTRACT.** A new species, *Potentilla polyphyloides* H. Ikeda & H. Ohba, is described and illustrated. It is assigned to section *Leptostylae* by having an herbaceous habit, slender or fusiform styles, auricles of stipules of basal leaves situated at adaxial side of petioles, and flowering stems from axils of basal leaves. It resembles *P. polyphylla* Wallich ex Lehmann, but differs by its glandular hairs on the lower surface of leaflets, pedicels, and the outside of episevals, as well as the occasional rooting at the axils of cauline leaves on the lower portion of flowering stems. *Potentilla polyphyloides* resembles *P. fallens* Cardot sharing the glandular hairs, but *P. fallens* differs in having nearly entire episevals that are shorter than the sepals, and longer styles nearly twice as long as the ovaries. *Potentilla polyphyloides* has a chromosome number of  $2n = 42$ , while that of *P. polyphylla* and *P. fallens* is  $2n = 28$ .

**Key words:** China, chromosome number, *Potentilla*, Rosaceae, section *Leptostylae*.

Ikeda and Ohba (1993, 1999) revised the taxonomy of *Potentilla* sect. *Leptostylae* in the Himalayas and adjacent regions. Species of section *Leptostylae* are characterized by sharing an herbaceous habit, slender or fusiform styles, auricles of stipules of basal leaves situated at the adaxial side of petioles, and flowering stems from the axils of basal leaves (Ikeda & Ohba, 1999). In 1994 and 1996, Wu et al. collected specimens of one *Potentilla* resembling *P. polyphylla* Wallich ex Lehmann in a meadow on Mt. Cangshan, Yunnan Province, southwest China. It was assigned to section *Leptostylae*, but Ikeda and Ohba (1999) excluded this from their

revision due to insufficient material. After completing the manuscript of this revision, Wu and Ikeda found the same *Potentilla* again in a meadow on Mt. Cangshan in 1997. After the study of its morphological variation, chromosome number, and reproductive biology, it is concluded that the material represents a new species.

Somatic chromosomes were counted from root tips. In the field root tips were pretreated in 2 mM 8-hydroxyquinoline solution for 2–3 hours and fixed in Newcomer's fluid. They were subsequently macerated in 1N HCl at 60°C for 10.5 min., stained with 2% lacto-propionic orcein, and squashed for cytological observation.

***Potentilla polyphyloides*** H. Ikeda & H. Ohba, sp. nov. TYPE: China. Yunnan: Yangbi, Cangshan—a Fruit Garden—Yangbi, 3230 m, 19 Aug. 1997, S. G. Wu, H. Ikeda, S. Akiyama, F. Miyamoto & W. Chen 91 (holotype, KUN; isotypes, A, E, HYO, MO, TI). Figures 1, 2.

Ab affini *P. polyphylla* Wallich ex Lehmann perspicue differt hypanthio, pedicellis et foliolis subtus glandulosis. Planta propter indumentum glandulosum *P. fallenti* Cardot appropinquat, sed episevalis 3–7-dentatis sepalis longioribus et stylis ovariis brevioribus satis distincta.

Perennial acaulescent herb with thick simple or sometimes branched rootstocks. Basal leaves oblanceolate, imparipinnate, 8–20 × 2–4 cm, petiolate, forming a rosette; lateral leaflets 10 to 15 pairs, serrate, gradually decreasing in size toward base, with alternating smaller leaflets; petioles 0.8–3.5 cm long, with ascending or patent unicellular hairs; base of uppermost leaflet pair cuneate. Leaflets with appressed or ascending unicellular hairs



Figure 1. *Potentilla polyphyloides* H. Ikeda & H. Ohba, habit. Scale bar = 2 cm. Drawn from the Wu *et al.* 91 isotype at TI.

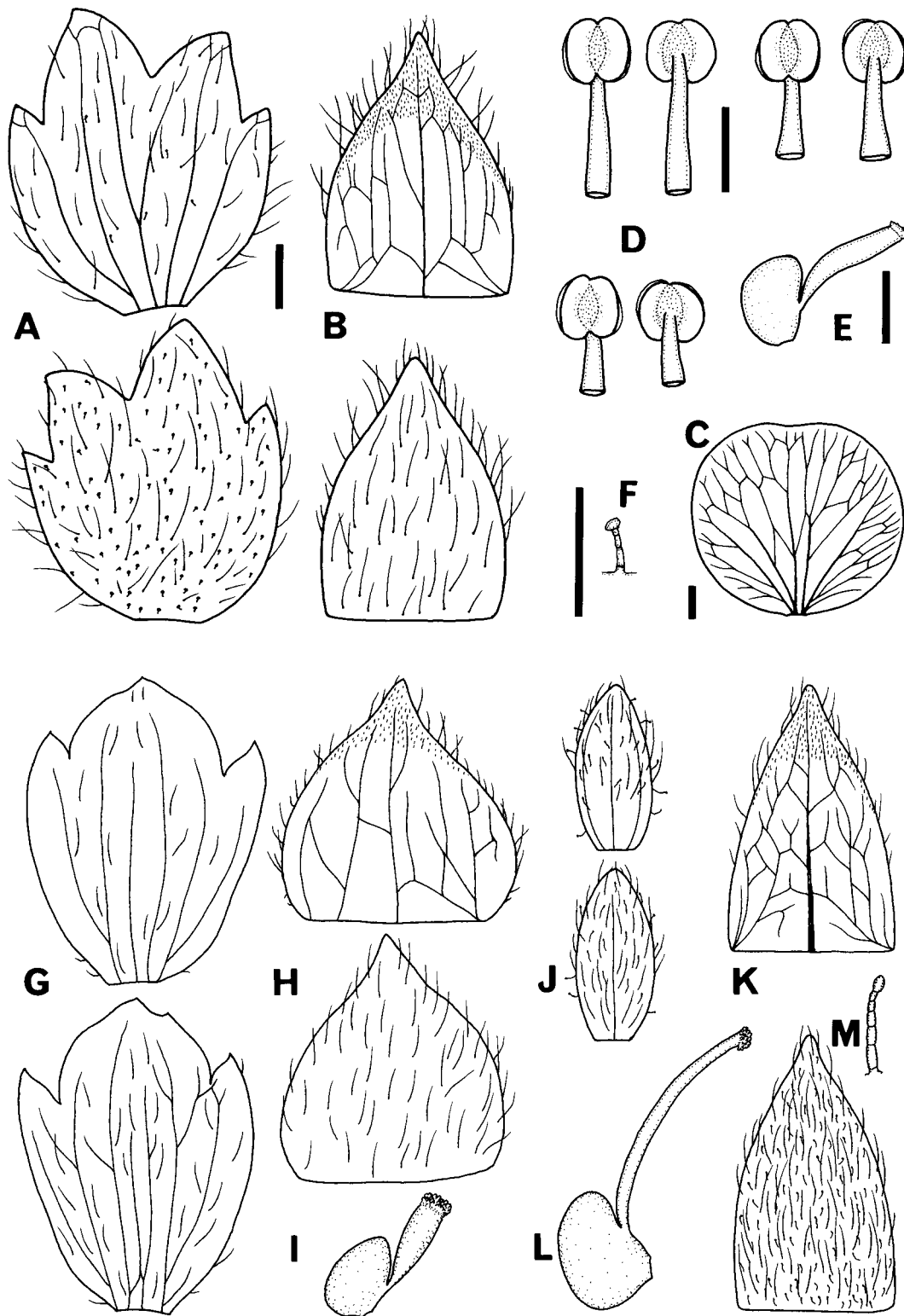
on upper surface, glandular hairs and ascending unicellular hairs on lower surface; terminal leaflet subsessile, oblong to obovate, 1.2–2.4 × 0.7–1.4 cm, serrate with 17 to 33 teeth per leaflet. Auricles of stipules free. Peduncles 17–60 cm long, ascending or prostrate, with appressed or ascending unicellular hairs, occasionally rooting from the nodes. Cauline leaves trifoliolate or with 2 to 8 pairs of leaflets, sometimes with alternating smaller leaflets. Auricles of stipules entire or with a few teeth in lower ones, 10 to 20 teeth in upper ones. Pedicels 1.2–3.8 cm long, with glandular hairs and appressed or ascending unicellular hairs. Flowers in a dichasium, 1.1–1.5 cm across. Hypanthia 4–8 mm across. Episepals oblong to widely obovate, 2.5–5.5 × 2–4.5 mm, usually serrate with 3 to 7 teeth, rarely entire, apex acute, with glandular hairs and ascending unicellular hairs on both sides, usually longer than sepals. Sepals elliptic to ovate, 2.5–4 × 1.8–4 mm, entire, apex acute to obtuse, ascending unicellular hairs on outer side and mar-

gin, lanate apically, glabrous basally on inner side. Petals obovate to widely obovate with round or retuse apex, 5–6.5 × 3.5–7 mm. Stamens 20, in 3 whorls; antisepalous ones 5, from the inner whorl longer than others, 1.6–2.2 mm long; antipetalous stamens 5, from the middle whorl shorter than others, 1.2–1.3 mm long; those located between petals and sepals 10, from the outer whorl, 1.4–1.6 mm long; anthers spheroidal, subbasal, with 4 locules, 0.7–0.8 mm across. Ovaries ellipsoid, smooth, 0.5–0.6 × ca. 0.4 mm; style subbasal, 0.8–0.9 mm long; stigma slightly inflated, papillate; placenta located at ventro-lateral side near style base. Achenes many, on dome-shaped receptacle, obliquely ellipsoid, smooth, 1.2–1.4 × 0.7–0.9 mm.

*Potentilla polyphyloides* resembles *P. polyphylla* in sharing 3- to 7-dentate episepals longer than sepals and relatively short styles (ca. 1.5× as long as ovaries). However, *P. polyphyloides* differs from *P. polyphylla* in having glandular hairs on the lower

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Figure 2. Floral dissections comparing *Potentilla polyphyloides* (A–F), *P. polyphylla* (G–I), and *P. fallens* (J–M). — A, G, J. Episepals, inner surface (upper) and outer surface (lower). — B, H, K. Sepals, inner surface (upper) and outer surface (lower). — C. Petal. — D. Three types of stamens: antisepalous ones (upper left two), between petals and sepals



(upper right two), and antipetalous (lower two). For each stamen pair, inner surface (left) and outer surface (right). — E, I, L. Pistils. — F, M. Multicellular hairs with glandular tips. Scale bars: A, B, G, H, J, K to same scale bar = 1 mm; C, D scale bars = 1 mm; E, I, L to same scale bar = 0.5 mm; F, M to same scale bar = 0.5 mm.

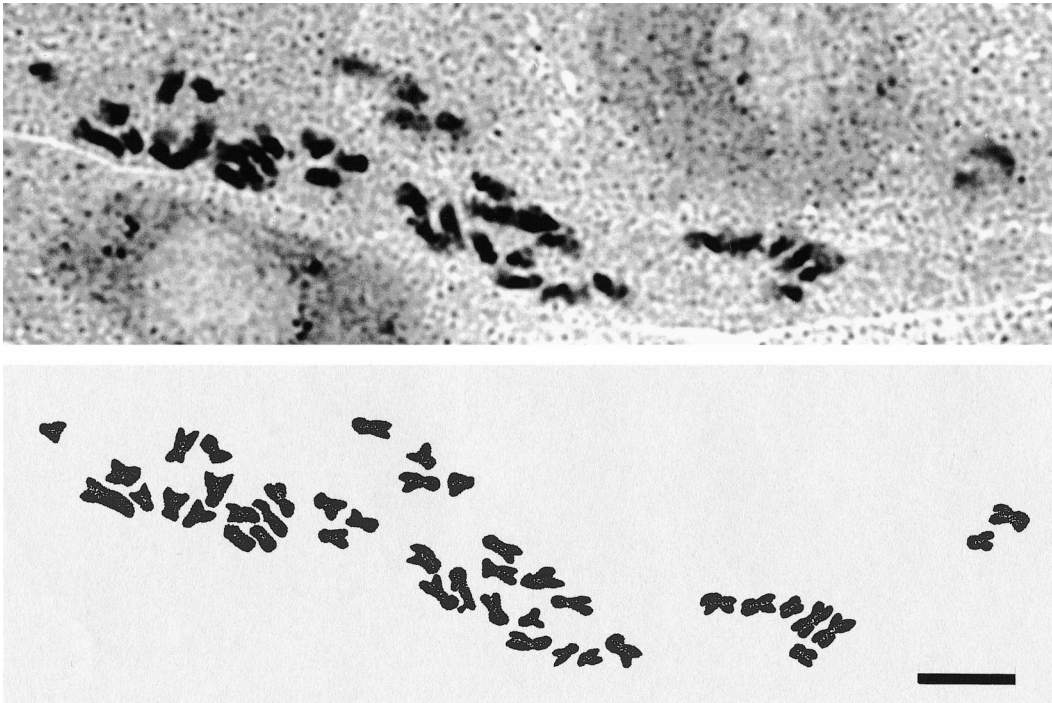


Figure 3. Somatic chromosomes at metaphase of *Potentilla polyphyloides*. Upper: microphotograph of chromosomes. Lower: drawing based on photograph. Scale bar = 5  $\mu\text{m}$ .

surface of leaves, pedicels, and the outside of episeals, as well as occasional rooting at axils of cauline leaves along the lower portion of flowering stems. *Potentilla polyphyloides* resembles *P. fallens* Cardot in sharing glandular hairs, but *P. fallens* differs from *P. polyphyloides* by its nearly entire episeals shorter than the sepals and the styles nearly twice as long as the ovaries (Fig. 2).

*Potentilla polyphyloides* makes gregarious communities on grazed grassland slopes between 3200 and 3500 m altitude, and sometimes it becomes a dominant species. It bears flowers and fruit well in the field and may reproduce sexually by seeds as well as vegetatively by detaching from rooted nodes of flowering stems; *P. polyphylla* and *P. fallens* reproduce only by seeds.

*Potentilla polyphyloides* is known only from Mt. Cangshan. *Potentilla polyphylla* is distributed in the Himalaya, southwestern China (Yunnan Province), and southeastern Asia (Java); *P. fallens* occurs in southwestern China in Yunnan and Sichuan Provinces. These two species grow on grassland, similar to *P. polyphyloides*, but they have not been recorded from Mt. Cangshan (Ikeda & Ohba, 1993).

Figure 3 shows the somatic chromosomes of *P. polyphyloides*. The chromosome number of *P. polyphyloides* is  $2n = 42$ , different from the  $2n =$

28 of *P. polyphylla* (Ikeda & Ohba, 1993) and *P. fallens* (Ikeda & Ohba, unpublished). Since the basic chromosome number of *Potentilla* is  $x = 7$  (Shimotomai, 1930), *P. polyphyloides* is a hexaploid species while *P. polyphylla* and *P. fallens* are tetraploid taxa.

With the addition of *Potentilla polyphyloides*, the key to the species of *Potentilla* sect. *Leptostylae* series *Lineatae* presented in Ikeda and Ohba (1993, 1999) should be changed as follows.

KEY TO THE SPECIES OF *POTENTILLA* SECTION *LEPTOSTYLAE*  
SERIES *LINEATAE*

- 1a. Two auricles of stipules of basal leaves connate from base to middle . . . . . *P. festiva* Soják
- 1b. Two auricles of stipules of basal leaves free from each other.
  - 2a. Base of uppermost leaflet pair decurrent . . . . . *P. josephiana* H. Ikeda & H. Ohba
  - 2b. Base of uppermost leaflet pair cuneate.
    - 3a. Peduncles and hypanthia without glandular hairs . . . . . *P. polyphylla* Wallich ex Lehmann
    - 3b. Peduncles and hypanthia with glandular hairs.
      - 4a. Stigma not inflated; leaves densely sericeous on lower surface . . . . . *P. lineata* Treviranus
      - 4b. Stigma inflated; leaves sparsely strigose on lower surface.

- 5a. Episepals nearly entire, shorter than sepals; styles nearly twice as long as ovaries . . . . .  
. . . . . *P. fallens* Cardot
- 5b. Episepals with 3 to 7 teeth, longer than sepals; styles 1.5 times as long as ovaries . . . . .  
. . . . . *P. polyphyloides* H. Ikeda & H. Ohba

*Paratypes.* CHINA. **Yunnan:** Dali, Cangshan, Zhonghe Peak, 3390 m, 3 Oct. 1994, S. G. Wu et al. 1305 (KUN, TI); Dali, Cangshan, 3440 m, 1 Sep. 1996, S. G. Wu et al. 968 (KUN, TI); Yangbi, Cangshan—a Fruit Garden—Yangbi, 3500 m, 19 Aug. 1997, S. G. Wu et al. 92 (KUN, TI).

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