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# A New Species of *Pseudostellaria* (Caryophyllaceae) from Gansu, China

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**ABSTRACT.** A new species, *Pseudostellaria polymorpha* Y. S. Lian (Caryophyllaceae), is described from Gansu Province, China. The species is remarkable for the regular variation in its floral morphology from stem apex to base. The terminal chasmogamous flower is largest, having five oval-lanceolate sepals, five oblanceolate petals noticeably longer than the sepals, 10 stamens, and an ovary with two long filamentous styles. The flowers along the upper portions of the stems have four sepals, only two or three petals equal or slightly shorter than the sepals, six to eight stamens including one or two sterile ones, and an ovary with two filamentous, shorter styles. The cleistogamous flowers are solitary in the axils of the basal portion of the stem, with four densely pilose sepals, three petals obviously shorter than the sepals or reduced, two sterile stamens, and an ovary with two styles obviously shorter than the ovary itself. This floral transition is rare in *Pseudostellaria* Pax, and is therefore a feature by which the new species is easily distinguishable from other members of the genus.

**Key words:** Caryophyllaceae, China, Gansu Province, *Pseudostellaria*.

*Pseudostellaria* Pax is a small genus in the Caryophyllaceae with about 18 species known from Central Asia and Afghanistan to Japan, as well as Europe and North America (Dequan & Rabeler, 2001), with nine species distributed in China. While studying specimens of *Pseudostellaria* from Gansu Province in China in 2002, the author found two remarkable specimens of this genus. These represent a new species distinguished by its regular, basipetalous variation in floral morphology. This rare feature is not otherwise known in *Pseudostellaria* or in Caryophyllaceae, and it easily distinguishes the new species from other members of the genus.

***Pseudostellaria polymorpha*** Y. S. Lian, sp. nov.

**TYPE:** China. Gansu: Tianzhu Xian, Shimen ravine, under forest on shady slope, 2800 m, 20 June 1989, Wang Qingrui & Yan Minsheng 12092 (holotype, NWTC). Figure 1.

Species haec ab omnibus congeneris florum structura ab apice ad imum caulium variationem ordinate praebente (petalorum et staminum longitudine manifeste abbreviata atque numeris citio reductis, stylorum longitudine manifeste

abbreviata, sepalorum numero e 5 ad 4 reducto) distinguitur; quoad foliorum formam etiam scaules prostratos *Pseudostellaria himalaicae* (Franchet) Pax similis, sed ab ea caulii foliis ovatis usque late ovatis utrinque glabris vel interdum sparsim puberulis atque seminibus minute tuberculatis bene differt.

Perennial herbs with fusiform tubers; stems erect, 10–20 cm, with biseriate hairs, with creeping branches at lower nodes. Leaves opposite, ovate or widely ovate, 10–20 × 7–12 mm, membranous, glabrous or sparsely pubescent, apex acute, usually with mucro ca. 1 mm, base nearly rounded or widely cuneate, margins basally ciliate; petioles 1–4 mm. Flowers terminal or solitary in branch axils; pedicels 1.2–2.2 cm, with biseriate hairs. The chasmogamous flower terminal and largest, with 5 sepals oval-lanceolate, 3.2–3.6 × 0.9–1 mm, with a few scattered pilose hairs only along abaxial midrib; petals 5, oblanceolate, 4.7–5.1 × 1.1–1.4 mm, bilobed at apex, exceeding the sepals; stamens 10, to 4.5 mm, anthers purple; ovary coniform, 1–1.2 mm diam., with 2 filamentous styles to 4 mm, 2–3× longer than the ovary. Flowers along the upper half of stems, with 4 sepals oval-lanceolate, 2.5–3 × 0.6–0.8 mm; petals 2 or 3, subequal to sepals; stamens 6 to 8, ca. 1.5 mm, including 1 or 2 sterile ones ca. 0.8 mm; ovary coniform, 0.8–1.2 mm diam., with 2 filamentous styles to 1.3 mm, 1.2–1.6× longer than the ovary. Cleistogamous flowers solitary in axils of the lower stems; with 4 sepals linear-lanceolate, 2.5–3 × 0.4–0.6 mm, densely pilose; petals 3, 1–1.5 × 0.3–0.5 mm, obviously shorter than the sepals or reduced; stamens 2, sterile, ca. 1 mm; ovary coniform, 2–2.5 mm diam., with 2 styles, to 1 mm, much shorter than the ovary. Fruit a coniform capsule, with numerous seeds; seeds subglobose, ca. 1 mm diam., minutely tuberculate.

**Distribution and habitat.** *Pseudostellaria polymorpha* is known only from the type collected from Shimen ravine in Tianzhu County of Gansu Province, China. It was observed at elevations of 2750–2800 m, on shady slopes in forests.

The type locality in Tianzhu is located at the transitional zone from the Qinghai–Tibet plateau to Nei Mongol–Xinjiang plateau. The ecological conditions in the region are variable and quite harsh for the plants. It was difficult to assess the distributional

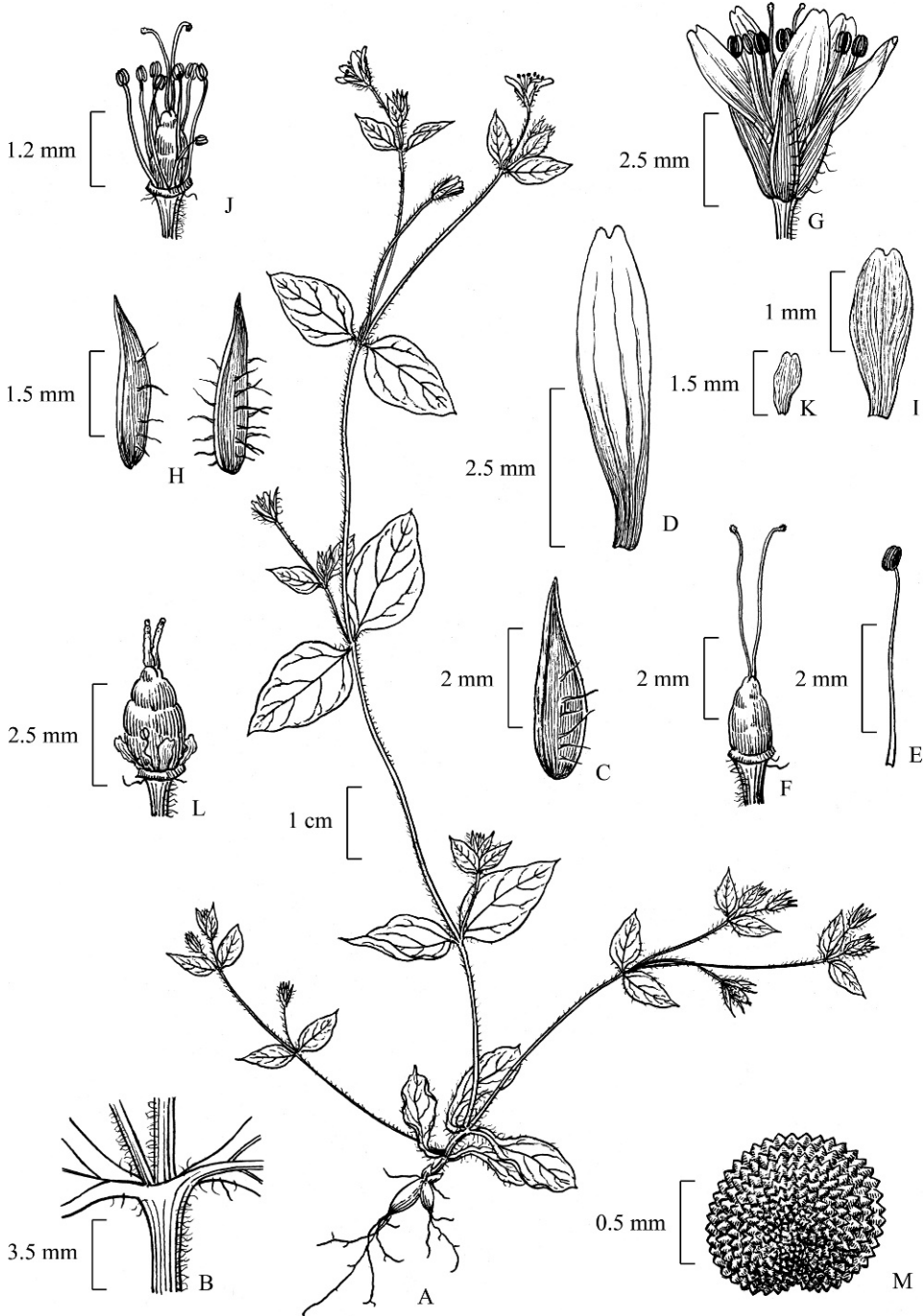


Figure 1. *Pseudostellaria polymorpha* Y. S. Lian. —A. Habit. —B. Stem with biseriate hairs. —C. Sepal of the chasmogamous flower. —D. Petal of the chasmogamous flower. —E. Stamen of the chasmogamous flower. —F. Gynoecium of the chasmogamous flower. —G. Chasmogamous flower. —H. Two sepals of flower from the upper half of erect stem. —I. Petal of flowers from the upper half of erect stem. —J. Stamens and gynoecium of flowers from the upper half of erect stem. —K. Reduced petal of lower cleistogamous flower. —L. Gynoecium of cleistogamous flower, with sterile stamen and reduced petals visible. —M. Tuberculate seed from cleistogamous flower. Drawn from the holotype (Wang Qingrui & Yan Minsheng 12092, NWTC) by Jianlu Bai.

extent of the new species, but it can be provisionally considered endemic to Tianzhu.

*Phenology.* *Pseudostellaria polymorpha* has been collected in flower in June and in fruit from June to July.

*Discussion.* The new species has an affinity with *Pseudostellaria himalaica*, with several characters in common, including the basic leaf shape and the prostrate stems. The two taxa differ in that the leaves of *P. polymorpha* are ovate to widely ovate and glabrous or sparsely pubescent, while those of *P. himalaica* are no more than ovate and are densely pubescent; the seeds of *P. polymorpha* are minutely tuberculate, while those of *Pseudostellaria himalaica* lack tubercles. Furthermore, *P. polymorpha* differs in its basipetalous variation in floral morphology. This feature is not previously known in *Pseudostellaria* and easily distinguishes the new taxon.

Capsules with seeds have been seen only from cleistogamous flowers on the basal stem. The

cleistogamous flowers have larger ovaries and two styles that are shorter than the ovary, whereas flowers that are chasmogamous or located on the upper half of the stem have smaller ovaries and two styles that are longer than the ovary. Further study is needed to determine whether style length affects pollen tube development and fertilization.

*Paratype.* CHINA. **Gansu:** Tianzhu Xian, Shimen ravine, 2750 m, 21 June 1989, Wang Qingrui & Yan Minsheng 12101 (NWTC).

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