

## Nomenclatural transfer of Chinese *Pulsatilla* to *Anemone* (Ranunculaceae)

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*Pulsatilla* has been separated from *Anemone* by many authors. However, molecular phylogenies show that this genus, along with *Barneoudia*, *Knowltonia*, *Hepatica* and *Oreithales*, is nested with *Anemone*. For this reason, *Pulsatilla* is better treated as a section of *Anemone*. For the Chinese *Pulsatilla* species, nine species names are already available in *Anemone*, and the remaining names of three species and four infraspecific taxa are transferred to *Anemone* here.

Miller (1754, p. 1136) described *Pulsatilla* as a separate genus that differs from *Anemone* L. by achenes with straight, elongated hairy styles. Subsequently, Candolle (1818, p. 189) treated *Pulsatilla* as a section under *Anemone*, i.e. *Anemone* sect. *Pulsatilla* (Mill.) DC. Recently, molecular phylogenies show that the genus *Anemone* is a paraphyletic group, and sampled species of *Barneoudia* Gray, *Knowltonia* Salisb., *Hepatica* Mill., *Oreithales* Schltdl., and *Pulsatilla* are nested within *Anemone* (Meyer et al. 2010, Hoot et al. 2012). Based on this, Hoot et al. (2012) adopted the taxonomic rank of section for *Anemone* sect. *Pulsatilla*, and this decision is followed here.

The traditional *Pulsatilla* contains about 38 species (Tamura 1993). Of these, 11 species and five infraspecific taxa are accepted as growing in China (Wang and Bartholomew 2001, Yu et al. 2010, Zhao et al. 2011). For these Chinese *Pulsatilla* species, nine species names are already available in *Anemone*. Below, the remaining names of three species and four infraspecific taxa are transferred to *Anemone*.

### *Anemone ambigua* Turczaninow ex Hayek var. *barbata* (J. G. Liu) Nang Jiang & W. B. Yu comb. nov.

**Basionym:** *Pulsatilla ambigua* var. *barbata* J. G. Liu (1992, p. 236). **Type:** China. Xinjiang: Shawan, 27 May 1962, anonymous 00667 (holotype: XJBI).

*Anemone ambigua* var. *barbata* (J. G. Liu) Nang Jiang & W. B. Yu is endemic to the Xinjiang Province, where it occurs in forest margins at an altitude of about 2100 m a.s.l (Liu 1994). This variety is distinguished from the type variety by having a barbate apical appendage at the apex of the sepal (Liu 1992).

### *Anemone campanella* (Fischer ex Regel & Tiling) Nang Jiang & W. B. Yu comb. nov.

**Basionym:** *Pulsatilla albana* (Stevenson) Berchtold & J. Presl var. *campanella* Fischer ex Regel & Tiling (1859, p. 30).

**Based on the same type:** *Pulsatilla campanella* (Fischer ex Regel & Tiling) Krylov (1931, p. 1169).

**Type:** Russia. Siberia (not precisely designated).

Fischer firstly named this taxon as “*Pulsatilla campanella*”, but its earliest name was validly published at the rank of variety under *P. albana* (Stevenson) Berchtold & J. Presl by Regel and Tiling in 1859. Krylov was the first to treat it as a species, still adopting Regel and Tiling’s epithet and thus basing the species name on the name of this variety. In the Chinese edition of ‘Flora Reipublicae Popularis Sinicae’, Wang (1980) mistakenly cited it as “*Pulsatilla campanella* Fischer ex Regel & Tiling Fl. Ajan. 30. 1859”. In the updated and English edition of ‘Flora of China’, the citation “*Pulsatilla campanella* Fischer ex Krylov, Fl. Zapadnoi Sib. 5: 1168. 1931” is also incorrect.

*Anemone campanella* is primarily distributed in central Asia. In China, this species is only found in western Xinjiang (Liu 1994). It prefers growing on grassy slopes at altitudes of 1800–3700 m a.s.l.

### *Anemone patens* subsp. *flavescens* (Zuccarini) Nang Jiang & W. B. Yu comb. nov.

**Basionym:** *Anemone flavescens* Zuccarini (1826, p. 371).

**Based on the same type:** *Pulsatilla patens* subsp. *flavescens* Zuccarini (1926, p. 95), – *P. flavescens* (Zuccarini) Juzepczuk (1937, p. 296).

**Type:** Russia. Siberia (not precisely designated).

The species *Anemone patens* includes several infraspecific taxa. There are three subspecies recorded in northern China, namely *A. patens* subsp. *patens*, subsp. *flavescens* and subsp. *multifida*. Among them, *A. patens* subsp. *patens* and subsp. *flavescens* are only found in northern Xinjiang, while subsp. *multifida* extends from Xinjiang to inner Mongolia and Heilongjiang (Liaoning Inst. of Forestry and Soil 1975, Zhao 1988, Liu 1994, Wang and Bartholomew 2001). Morphologically, the type subspecies of *A. patens* is characterized by almost kidney-shaped leaves, and its leaf blade lobes have 1 or 2 secondary lobes, with ultimate lobes being triangular, narrowly triangular, or triangular-lanceolate, while subsp. *flavescens* and subsp. *multifida* have round-ovate or 5-sided leaves, and their leaf blade lobes are finely divided, with ultimate lobes being linear lanceolate to narrowly linear (Wang and Bartholomew 2001). In addition, *A. patens* subsp. *flavescens* has milk-white to yellowish sepals, while the other two subspecies generally have lilac to violet-blue sepals.

***Anemone sukaczewii* (Juzepczuk) Nang Jiang & W. B. Yu comb. nov.**

**Basionym:** *Pulsatilla sukaczewii* Juzepczuk (1937, p. 741).

**Type:** Russia. Baikal, Krestovka, 30 Jun 1928, V. N. Sukaczew et al. s.n. (holotype: LE).

Morphologically, *Anemone sukaczewii* is similar to *A. tenuiloba* Turcz. ex Hayek, but it may be distinguished from the latter by having yellow or whitish sepals and smaller leaves with 4 or less leaflets (Wang and Bartholomew 2001). *Anemone sukaczewii* occurs in northeastern Asia. In China, this species is mainly growing on dry meadows and slopes in inner Mongolia and Heilongjiang at an altitude of about 300 m a.s.l (Liaoning Inst. of Forestry and Soil 1975, Zhao 1988).

***Anemone turczaninovii* (Krylov & Sergievskaja) Nang Jiang & W. B. Yu comb. nov.**

**Basionym:** *Pulsatilla turczaninovii* Krylov & Sergievskaja (1930, p. 1).

**Type:** Russia. Siberia (not precisely designated).

**Taxonomic synonym:** *Pulsatilla turczaninovii* f. *albiflora* Y. Z. Zhao (1988, p. 657).

**Type:** China, inner Mongolia [Nei Mongol]: Daqingshan, Halaqingou, 16 May 1965, Y. Q. MA 26 (holotype: NMU).

***Anemone turczaninovii* var. *fissisepala* (J. H. Yu) Nang Jiang & W. B. Yu, comb. nov.**

**Basionym:** *Pulsatilla turczaninovii* var. *fissisepala* J. H. Yu et al. (2010, p. 648) (“*fissisepalum*”).

**Type:** China, inner Mongolia [Nei Mongol]: Muo'erdaga, 24 May 2010, J. H. Yu dxalz100521001 (holotype: NEFI).

***Anemone turczaninovii* var. *hulunensis* (L. Q. Zhao) Nang Jiang & W. B. Yu comb. nov.**

**Basionym:** *Pulsatilla turczaninovii* var. *hulunensis* L. Q. Zhao et al. (2011, p. 2131).

**Type:** China, inner Mongolia [Nei Mongol]: Hulunbeier, 9 May 2009, L. Q. Zhao 09-001 (holotype: HIMC).

*Anemone turczaninovii* occurs in northern China, as well as in Mongolia and Russia (Far East, Siberia). In 2010 and 2011, two varieties were described under *P. turczaninovii* (= *A. turczaninovii*) (Yu et al. 2010, Zhao et al. 2011). *Anemone turczaninovii* var. *fissisepalum* is distinguished from var. *turczaninovii* by having its outermost sepals tripartite, and the middle lobe of the sepal larger than two lateral lobes (Yu et al. 2010). *Anemone turczaninovii* var. *hulunensis* is distinguished from the other varieties by having a longer scape and numerous reddish and oblong-linear sepals (Zhao et al. 2011). So far, these two varieties have only been found in their type localities.

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