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Persicaria wugongshanensis (Polygonaceae: Persicarieae), an odoriferous and distylous new species from Jiangxi, eastern China

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Abstract

Persicaria wugongshanensis, a new species from Wugongshan Mountain, Jiangxi Province in eastern China, is described and illustrated. The new species is a distinctively odoriferous herb characterized by having glandular leaves and tepals, stout inflorescences, dimorphic flowers, extraordinarily long pedicels and densely pitted achenes. A morphological comparison among the new species and its putative relatives, *P. hydropiper*, *P. japonica*, *P. jucunda* and *P. odorata*, is presented. Comparative micromorphological characters of achenes, leaves, pollen grains and tepals of the new species and its closest relative *P. odorata* were also presented. Distyly and its ancillary dimorphism were observed and described. The somatic chromosome number (2n = 20) and karyotype formula (2n = 14 m + 6 sm) of the new species were reported.

Key words: Chromosome number, distyly, endemic species, micromorphology, palynology, new species, Wugongshan Mountain

Introduction

Persicaria (Linnaeus 1753: 360) Miller (1754: without page) is formerly and popularly treated as synonym of *Polygonum* Linnaeus (1753: 359) in tribe Polygoneae (Polygonaceae). Though most taxonomists treated it as an infrageneric group of *Polygonum* (Meisner 1856, Bentham & Hooker 1880, Dammer 1893, Steward 1930, Tutin *et al.* 1991, Li 1998, Li *et al.* 2003), the segregation of the two genera was strongly supported by several morphological and anatomical studies (Hedberg 1946, Haraldson 1978, Ronse Decraene & Akeroyd 1988, Ronse Decraene *et al.* 2000), as well as by recent molecular studies (Kim & Donoghue 2008a, Galasso *et al.* 2009, Sanchez *et al.* 2009, Burke *et al.* 2010, Sanchez *et al.* 2011). In this background, genera and tribes in the buckwheat family have been redefined, and *Persicaria* has been placed in the redefined tribe Persicarieae (Sanchez *et al.* 2011).

Persicaria comprises ca. 150 species and is distributed mainly in the northern temperate regions but extends into tropical regions (Brandbyge 1993). It includes prostrate or twining annual or perennial herbs, with many-flowered, spike-like or capitate inflorescences; 4–5-parted tepals with trifid venation; 4–8 stamens; pollen grains spheroidal (globose) and rough reticulate (often with tectate and pilate exine patterning) (Haraldson 1978, Ronse Decraene & Akeroyd 1988, Brandbyge 1993).

During a field trip in September 2006 to the Wugongshan Mountain (Jiangxi Province, eastern China), a Polygonaceae species was collected and provisionally identified by me as *Persicaria japonica* (Meisner in de Candolle 1856 : 112) Nakai (in Ohki 1926 : 51), although I also noticed that the plant was remarkably different from *P. japonica* in a series of characters, such as its smell, annual habit, ovate to ovate-lanceolate leaf blades, densely pitted achenes and extraordinarily long pedicels. Subsequently, a dried specimen was sent to the expert Prof. Anjen Li (Institute of Botany, the Chinese Academy of Sciences): he suggested that it could represent a new species. Therefore, further investigations on ecology, floral and pollination biology were carried out from September 2009 to October 2011, and some individuals were cultivated in the South China Botanical Garden. Its status as a new species is thus fully confirmed, and the results are here reported.

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TABLE 3. Micromorphological comparison of *Persicaria wugongshanensis* and *P. odorata*.

	P. wugongshanensis	***P. odorata***
Achene surface	polygons surrounded by papillae	irregularly shallow reticulations
Leaf epidermis	upper leaf epidermis: epidermal cells polygonal, stomatal apparatus paracytic lower leaf epidermis: stomata size 18.6 (17.8–19.7) μm × 15.7 (14.5–16.9) μm, stomata density 253 number/mm^2, guard cells enclosed by 2 subsidiary cells mostly unequal in size or sometimes 3 obviously unequal in size	upper leaf epidermis: epidermal cells irregular, stomatal apparatus anisocytic lower leaf epidermis: stomata size 25.4 (23.1–26.8) μm × 19.6 (18.2–20.9) μm, stomata density 197 number/mm^2, guard cells enclosed by 2 equal subsidiary cells
Pollen grains	L-morph: lumen polygonal, uniform, 7.64 ± 0.351 μm in size, 7 (6–8) lumina across the diameter, columellae in a lumen 19 (16–27) S-morph: lumen polygonal, uniform, 10.21 ± 0.512 μm in size, 8 (7–9) lumina across the diameter, columellae in a lumen 37 (26–48)	L-morph: lumen irregular, unequal, 8.42 ± 0.719 μm, in size, 9 (8–10) lumina across the diameter, columellae in a lumen 24 (15–31) S-morph: lumen polygonal, unequal, 11.63 ± 0.823 μm in size, 5 (6–7) lumina across the diameter, columellae in a lumen asymmetrical, 33 (24–45)
Tepal inner surface	epidermal cells 45–72 μm × 14–25 μm, longitudinal direction with striate cuticles, anticlinal wall straight or sinuolate, surface granular	epidermal cells 35–55 μm × 8–15 μm, longitudinal direction with striate cuticles, anticlinal wall sinuate, surface with intensely developed ridge

Diagnostic key of the taxa studied

1. Leaves with peppery taste; flowers monomorphic ..... *P. hydropiper*
- Leaves without peppery taste; flowers dimorphic 2
2. Inflorescences uninterrupted; flowers small; tepals without glandular dots ..... *P. jucunda*
- Inflorescences usually interrupted at base; flowers large; tepals densely or sparsely golden punctuate 3
3. Plants without special odor; stems, leaves and ocreae densely or sparsely appressed..... *P. japonica*
- Plants intensely odoriferous (just like *Houttuynia* Thumb.); stems, leaves and ocreae glabrous or pubescent..... 4
4. Perennial herbs with developed rhizomes; leaf blades lanceolate or narrowly lanceolate, both surfaces glabrous or nearly glabrous; ocreae glabrous; achenes shiny, smooth .....*P. odorata*
- Annual herbs; leaf blades ovate or ovate-lanceolate, rarely broadly lanceolate, both surfaces sparsely pubescent; ocreae densely pubescent; achenes opaque, densely pitted..... *P. wugongshanensis*

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