

A new subgenus of *Incarvillea* (Bignoniaceae)

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Currently four subgenera are recognized in the genus *Incarvillea* Juss. (Bignoniaceae). *Incarvillea* subgen. *Olgae* S.T. Chen, K.Y. Guan & Z.K. Zhou is proposed here based on morphological and molecular data. Morphologically *Olgae* differs from the other subgenera in having paniculate inflorescences, opposite leaves (vs. radical or alternate), calyx teeth flat at base and simple plicae between calyx teeth. Also molecular phylogenetic studies support a separate position for *I. olgae* Regel.

Key words: Bignoniaceae, *Incarvillea*, new subgenus, taxonomy

Incarvillea Juss. is a temperate and herbaceous genus (general characters are listed in Table 1) of a primarily tropical and woody family Bignoniaceae. It has 16 species (Grierson 1961, Zhao 1988, Yi *et al.* 1990, Grey-Wilson 1998). The modern classification of *Incarvillea* was established by Grierson (1961), who divided the genus into four subgenera, *Amphicome* (Royle) R. Br. *apud* Royle, *Incarvillea*, *Pteroscleris* Bailon, and *Niedzwedzkia* (B. Fedtsch) Grierson, based on characters of habit, calyx, capsule and seed (cf. Table 1). Most of the species occur in the Himalayas and SW China, except two species that are endemic to central Asia, *I. semi-retschenskia* and *I. olgae*, and the Mongolian *I. potaninii*.

Subgenera of *Incarvillea* differ considerably in many characters (including habit, calyx, stamens, capsule texture and seeds). It seems hard to infer phylogeny of the genus based on morphology due to extensive apparent character convergence. We studied *Incarvillea* over the past five years examining the pollen morphology,

karyomorphology, molecular systematics and biogeography (Chen *et al.* 2003, 2004, 2005). In the system of Grierson, based on characters such as ten-toothed calyx, siliquaeform capsule and membranous seed-wings, subgenus *Incarvillea* is composed of three species, *I. olgae*, *I. sinensis*, and the Mongolian *I. potaninii*, but when specimens from KUN, PK, E, P, K and LE were examined, we found that the morphology of *I. olgae* is quite different from the other species in subgenus *Incarvillea*. Characters peculiar to *I. olgae* include a paniculate inflorescence, opposite leaves, calyx teeth base not swollen and no calyx tube groove between calyx teeth. Phylogenetic analysis based on ITS and *trnL*-F sequences also did not support the subgenus *Incarvillea* to host *I. olgae* (Chen *et al.* 2005). Taking into account the peculiar morphological characters and the position in the molecular systematic tree, we subscribe here a new subgenus to accommodate *I. olgae* because this taxonomical arrangement reflects the evolution and phylogeny of the group more accurately.

***Incarvillea* Juss. subgen. *Olgaea* S.T.**
Chen, K.Y. Guan & Z.K. Zhou, *subgen. nov.*

Herba perennis erecta, fruticosa, basi lignescens. Folia opposita, unipinnata. Panicula. Calyx campanulatus, 5-lobati, lobis mucronatis, basi non inflatis. Capsula cylindrica, coriacea, ad suturam dorsalem longitudinaliter dehiscens, septo apice integro. Ala seminis pellucida, apice incisura distincta.

TYPE: *Incarvillea olgae* Regel.

Perennial herbs, often becoming woody at base. Leaves opposite, pinnate, pinnatisect or bipinnatisect. Inflorescence terminal, panicle. Calyx tube campanulate. Calyx teeth subulate or reduced to minute points, not swollen at the base, plicae between teeth membranous simple. Capsules coriaceous, cylindrical, acuminate at apex, dehiscing longitudinally on posterior side only. Septum entire at apex. Seed wing hyaline, entire.

SPECIMENS EXAMINED (and DISTRIBUTION): **Turkestan.** Inter Soch et Ochna, 30.VI.1871 *Fedtschenko s.n.* (LE); Bokhara. Hissar, 2050 m., *Lipsky 1117* (LE, BM). **Afghanistan.** Faizabad, 17.VI.1878 *Newssky s.n.* (LE); Kabul province, Salanga River, 30.IX.1924 *Bukinich s.n.* (LE). Sarn-Kotal, Hindu Kush, 2.X.1924 (Vavilov Expedn.) *Bukinich s.n.* (LE).

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Table 1. General characters of the genus *Incarvillea* and those of the five subgenera.

	<i>Incarvillea</i>	subgen. <i>Niedzwedzkia</i>	subgen. <i>Amphicome</i>	subgen. <i>Incarvillea</i>	subgen. <i>Pteroscleris</i>	subgen. <i>Olgaea</i>
Habit	Acaulous or stemmed	Suffruticose	Suffruticose	Suffruticose	Herbaceous	Suffruticose
Leaf	Alternate or opposite or radical	Alternate	Alternate	Alternate	Alternate or radical	Opposite
Calyx teeth	5 or 10	5	5	10	5	5
Calyx	Tube at base or whole	Tube at base	Tube	Tube	Tube	Tube
Calyx teeth base	Swollen or not	Not swollen	Not swollen	Swollen	Not swollen	Not swollen
Inflorescence	Racemose or paniculate	Racemose	Racemose	Racemose	Racemose	Paniculate
Anther	Pilose or glabrous	Glabrous	Pilose	Glabrous	Glabrous	Glabrous
Capsule shape	Ovate or cylindrical	Ovate	Elongate, linear cylindrical	Cylindrical	Cylindrical	Cylindrical
Capsule texture	Subligneous or fibrous or coriaceous	Subligneous	Fibrous	Coriaceous	Subligneous	Coriaceous
Capsule dehiscence	Septifragal or loculicidal	Septifragal	Loculicidal	Loculicidal	Loculicidal	Loculicidal
Capsule wing	6 or no	6	No	No	No	No
Seed	Opaque or hyaline wing, coma at ends	Opaque wing	Coma at ends	Hyaline wing	Opaque wing	Hyaline wing