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Typification of *Geranium arnottianum* Steud. (Geraniaceae)

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Abstract. Nomenclature issue of *Geranium arnottianum* is here discussed. The comparison of *G. arnottianum* with its allied species is also discussed for its easy identification.

Keywords: Geraniaceae, *Geranium,* nomenclature, Peninsula India Orientalis, typification.

INTRODUCTION

Geranium L. (1753) comprises c. 325 species (Aedo 2017) and is distributed in temperate regions (Aedo et al. 1998). Twenty-seven species are known from India (Malhotra 1997; Wagh et al. 2015). During the course of ongoing revisionary studies on *Geranium* from India, we found that the typification of *Geranium arnottianum* Steud. *(*1840) is incomplete and needs to be updated. *G. arnottianum* is the only species of the genus with distribution restricted to Peninsular India (Steudel 1840; Wight and Arnott 1834), contrary to *Geranium nepalense* Sweet and *Geranium ocellatum* Jacquem. ex Cambess. which are also reported from Himalaya (Wagh et al. 2015). *Geranium affine* Wight & Arn., the replaced synonym of *G. arnottianum,* was first described by Wight (1834) in his *Prodromous*. Robert Wight contributed immensely to the study of Indian plants spending about 1/3rd of his life in India from 1819 to 1853. Shortly after his arrival he showed ample devotion towards the study of Indian flora, especially the peninsular India, which is portrayed in his exhaustive botanical classic *'Icones Plantarum Indiae Orientalis'* (1838-1853). He distributed a great number of duplicates among other celebrated botanists in Britain and Europe during his life time (Basak 1981). Not being a learned botanist but a surgeon by profession, Wight met and collaborated with the established botanists of his time like R. Graham, W. Hooker, G.W. Arnott (his school and university friend), R. Brown, J. Lindley, J.F. Royle (Noltie 2006). Before leaving India in 1853 he presented important Indian collections

of over 4000 species to Kew Herbarium (K) just before his death, containing the type specimens of the names of the taxa described by him. Besides Kew (K) Herbarium as the main repository of his type specimens, some important sets are housed also at Geneva (G), Glasgow (GL) Leningrad (LE) and Paris (P) and various duplicates at the Calcutta (CAL), Madras-Coimbatore (MH) and Dehradun (DD) herbaria (Stafleu 1967; Basak, 1981).

This work is based on a comprehensive study of relevant literature, protologues and original material. The herbaria BR, E, G, GL, K, LE, NY, P, were surveyed online and BSD, CAL, MH in person to locate the original material (acronyms according to Thiers, 2020 continuously updated). In this communication, we designate the lectotype of *G. arnottianum* in accordance with Article 7.4, and 9.12 of Shenzhen Code (Turland et al. 2018).

Geranium arnottianum Steud., Nomencl. Bot., ed. 2, 1: 677. 1840

(≡) *G. affine* Wight & Arn. (1834: 133), *nom. illeg*., non Poir. (1812: 757), nec Ledeb. (1831: 229)

Type: India: Peninsula Ind. Orientalis, 1834, Herb. Wight. Propr. n. 438, (E, E00174280, digital image!) lectotype designated here. Figure 1.

Geranium arnottianum is the replacement name (Steudel 1840) of *G. affine* Wight & Arn., non Poir. (1812: 757) nec. Ledeb. (1831: 229). The replaced synonym *Geranium affine* described by Wight and Arnott in *Prodromous Florae Peninsulae Indiae Orientalis* is an illegitimate later homonym of *G. affine* Ledeb. *G. arnottianum* is a perennial herbaceous species with fascicled roots. The diffuse and procumbent stem provides a showy distinction while glabrous staminal filaments augment its demarcation from its allies, *G. sibiricum* L*, G. nepalense* and *G. thunbergii* Siebold ex Lindl. & Paxton, which exhibit decumbent and erect or ascending stems and staminal filaments with hairy base. Even the characteristic fascicled roots have not been reported in any of these three taxa. In addition, *G. arnottianum* is characterised by leaves with middle segment ovate, peduncles with 2 pedicellate flowers and petals twice the length of sepals in contrast to *G. sibiricum* which has leaf middle segment rhomboid-obtrullate, peduncle bearing a single pedicellate flower and petals about as long as sepals. Other demarcating characters include absence of roots at nodes (present in *G. nepalense* and *G. thunbergii*) and lanceolate stipules (*vs.* ovate, acuminate stipules in *G. thunbergii*).

The type of *G. arnottianum* is to be chosen within Wight's collection of *G. affine* from Indian Peninsula. Wight was extremely imprecise in the localities he gave on the specimens, these having been collected by his largely unsupervised collectors. This is probably the reason why the protologue does not bear any information about the type locality, rather cited *Wight! Cat. n*. 438, 439. These catalogue numbers represent the species number, not the collection number in his *Prodromous*. Following these numbers, we traced 10 herbarium sheets not from a single herbarium but housed in five different international herbaria viz. BR (1), E (5), GZU (1), NY (2) and P (1), possibly because a great number of duplicates were distributed among the celebrated botanists in Britain and Europe by Wight during his life time. In addition, one more specimen was examined in-person at MH (barcode MH00005619) with a handwritten number WC 439, but lacking the printed annotation "Peninsula Ind. Orientalis". All these specimens bear the same printed note "Peninsula Ind. Orientalis" (except the one at MH), in addition to corresponding species number "Herb. Wight. Propr. *n* 438 or 439", hence qualify as the syntypes of *G. arnottianum*. Nevertheless, Noltie (2005) while providing the type details of *G. affine*, cited the collections deposited at E only, as syntypes (sheet A & D) and isosyntypes (sheet B, C & E). According to article 9.3 and 9.4 of the ICN (Turland et al. 2018) the lectotype is to be designated from the syntypes. Among all these, the specimens housed at E are possibly the ones utilised by the authors and therefore have precedence over others as indicated by Noltie (2005), since Wight's herbarium collection used by Arnott as the basis for his work on *Wight's Catalogue, Wight's Contribution to the Botany of India* and *Prodromus Florae Peninsulae Indiae Orientalis,* is deposited at Royal Botanic Garden, Edinburgh. As a matter of fact, *Prodromous Florae Peninsulae Indiane Orientalis* was prepared during Wight's furlough (which he spent in Edinburgh to work on his material for the *Prodromus*) between 1831-1834, together with Arnott, based mainly on Wight's specimens (Noltie 2006). His furlough expired before the completion of the first volume and it was Mr. Arnott at Glasgow university during W. Hooker's time, who edited and published the *Prodromous* (http://www.microscopy-uk.org.uk/mag/artjan11/bs-arnott.html). Subsequently, the huge plant material received by Arnott from Wight was later placed on permanent loan to E with the foreign herbarium of Glasgow University in 1966 (https://websites.rbge.org.uk/wight/). The collection at E after keen observation however appears to be an amalgamation and the component herbaria from which the specimens had been received can be identified. In other words, the specimens of *G. aff-*

Figure 1. Lectotype of *Geranium arnottianum* Steud. (E00174280) ©Royal Botanic Garden, Edinburgh.

ine housed at E had not been received from Arnott only, but from R.K. Greville herbarium (sheet C), from University of St. Andrews (sheet B & E) actually sent by Wight to Graham, the professor of botany at Edinburgh (Cleghorn 1873) and only two from Glasgow University (sheet A & D). The latter two specimens thus represent the most plausible choice for typification. Although both comply appropriately with the protologue, the specimen on sheet A with barcode E00174280 provides marked exhibition of the diagnostic characters of *G. arnottianum:* peduncles much longer than leaves, stipules lanceolate with acuminate apex, leaf segments cuneate, ovate and villous on the nerves beneath, petals twice as long as the sepals. Therefore, among all the original materials, E00174280 is here selected as the lectotype of *G. arnottianum*.

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