

***Lepidium didymum* Linnaeus (Brassicaceae) – a new record for India from Jammu & Kashmir State**

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Abstract

This article records the occurrence of *Lepidium didymum* Linnaeus (Brassicaceae), for the first time from India in Western Himalaya of Jammu and Kashmir State. This communication increases the floristic data about the angiosperm diversity of the country, as well as it adds knowledge about the distribution of *Lepidium* Linnaeus at regional and global scenario. An updated taxonomy, phenology, cytology, ecological notes, associated vegetation components, and history of species discovery associated with *L. didymum* have been provided.

Key words: *Lepidium didymum*, New Record, J&K State, India.

INTRODUCTION

Lepidium Linnaeus is an economically important genus of Brassicaceae that comprises of 234 species distributed in Africa, America, Asia, Australia and Europe (TPL 2016; Mabberley 2008). Present investigation and mining of published literatures (Henry & Janarthanan 1993; Appel & Al-Shehbaz 2003; Muschler 1908; Al-Shehbaz *et al.* 2002; <http://indiabiodiversity.org>) recorded fourteen species in India growing at different altitudes in different agro-climatic zones. These include *L. africanum* (Burman f.) DC., *L. apetalum* Willdenow, *L. aucheri* Boissier, *L. capitatum* Hooker f. & Thomson, *L. cartilagineum* (J. Mayer) Thellung, *L. draba* Linnaeus, *L. didymum* Linnaeus (present study), *L. latifolium* Linnaeus, *L. obtusum* Basiner, *L. perfoliatum* Linnaeus, *L. pinnatifidum* Ledebour, *L. ruderale* Linnaeus, *L. sativum* Linnaeus and *L. virginicum* Linnaeus. However, publication made by Botanical Survey of India 'Flora of India' under Brassicaceae recorded only ten species (Henry & Janarthanan 1993, <http://efloraindia.nic.in>). While scrutiny of regional herbarium vouchers of Himalayan belts in different herbaria, three species, namely, *L. aucheri*, *L. cartilagineum*, and *L. draba*, found housed in pigeon holes, but not included in the published 'Flora of India, Vol. 2'. Total nine species *viz.* *L. apetalum*, *L. capitatum*, *L. draba*, *L. didymum* (present discovery), *L. latifolium*, *L. obtusum*, *L. ruderale*, *L. sativum*, and *L. virginicum* recorded, so far, from the state of Jammu and Kashmir (J&K) (Kachroo *et al.* 1977; Sharma & Kachroo 1981; Singh *et al.* 1981; Dhar & Kachroo 1983; Kaul 1986; Swami & Gupta 1998; Amjad 2015). Most of the taxa reported so far from different regions under *Lepidium* are small herbs and their occurrence recorded from wastelands, fields, forest margins, and occasionally roadsides (Henry & Janarthanan 1993; Dhar & Kachroo 1983).

While inventorying the vegetation compositions and community structures of high altitudes taxa of J&K state, a large number of the plant vouchers were collected from different locations. A total of 197 herbaceous samples were documented and herbarium vouchers were prepared by following Herbarium Technique (Jain & Rao 1977). Identified and authenticated vouchers were deposited at Janaki Ammal Herbarium (RRLH).



Figure 1. Location of *Lepidium didymum* in the study area

During exploration of floristic diversity of J&K, an interesting herbaceous species of the genus *Lepidium* was collected from the Patnitop and Sanasar area (33°05'09.8" N, 75°19'33.9" E, 2114m above sea level) of Udhampur district (Figure 1). After the critical examination of habit, habitat, community structures, vegetation compositions and associated taxa, dissection of flower morphology and scrutiny of the relevant taxonomic literatures (Hooker 1875; Kachroo *et al.* 1977; Sharma & Kachroo 1981; Singh *et al.* 1981; Dhar & Kachroo 1983; Kaul 1986; Swami & Gupta 1998; Appel & Al-Shehbaz 2003), the voucher samples were identified as *Lepidium didymum* Linnaeus. Review of published literatures exposed that this taxa has not been recorded previously from J&K or elsewhere from India. Linnaeus discovered this species from North America in 1767, and later on its distribution was reported from Bolivia, Honduras, Turkey, and Venezuela (www.tropicos.org; Yuzbasioglu & Keskin 2013). Therefore, the present collection of *Lepidium didymum* from J&K extends the geographical distribution from America, Europe, Africa, Australia to India in Asia. The present communication provided the updated taxonomy, phenology, cytology, ecological notes, associated vegetation components, and history of species discovery associated with *L. didymum*.

Taxonomic treatment

Lepidium didymum Linnaeus, Syst. Nat., ed. 12(2): 433. 1767 [PLATE – I].

[L.T.: Herb. Linn. 824.16, designated by W. Fawcett & A.B. Rendle. 1914. Family XXXII Cruciferae 3: 224].



PLATE - I. *Lepidium didymum* Linnaeus (Brassicaceae): **A.** Flowering twig; **B.** Juvenile plant before bolting; **C.** The Voucher specimen.

Annual or biennial rosette herbs, upto 25 cm high, with simple trichomes; roots slightly whitish, 10 - 15 cm deep penetrated. Stems branched from base, decumbent, often somewhat foetid, glabrous or hairy. Leaves two types: radical leaves, short, 1 or 2-pinnatisect, petioles 0.5 - 4.5 cm long, lamina entire; cauline leaves pinnatifid, 1.5 - 3 x 0.5 - 1.2 cm, sessile or subsessile, lobes sinuate-toothed, usually only on one side. Racemes elongated in matured plants, dense, ebracteate, 3 - 8 cm long, 30 - 60 flowered. Flowers minute, usually white, slightly greenish below; sepals ovate, 0.5 - 0.8 mm long; petals ovate to lanceolate, smaller than sepals, 0.3 - 0.4 mm long; stamens 2; filaments 0.3 - 0.4 mm; anthers whitish, minute. Fruiting pedicels short, 3 - 4 mm long, filiform. Fruits didymous, 1 - 2 mm long, 2 - 3 mm broad, looks broader than long, bilobed; valves globose, reticulately rugose; septum narrowly thin, inconspicuous; seeds ovate, 1 - 2 mm long, reddish-brown.

Phenology: Flowers during late March to July; fruiting starts in April and matured in July and matured ones can be seen till the end of October.

Cytology: Gametophyte chromosome count is 16 [Sporophyte count, $2n = 32$] (Bir & Sindhu 1975).

Distribution: Native of South America, naturalized in Central and North America, Europe, Asia (India: J&K), Africa, Australia.

Voucher: India: J&K State, District Udhampur, Patnitop, 33°05'09.8" N, 75°19'33.9" E, 2114m asl, 15th April 2015, B Singh 52976 (RRLH).

Species history: *Biscutella apetala* Walter, Fl. Carol. 174. 1788. *Senebiera pinnatifida* DC., Mem. Soc. Hist. Nat. Paris 1799: 144. 1799. *Cochlearia humifusa* Michaux, Fl. Bor.-Amer. 2: 27. 1803. *Senebiera didyma* (Linnaeus) Persoon, Syn. Pl. 2: 185. 1806. *Senebiera incisa* Willdenow, Enum. Pl. 2: 668. 1809. *Coronopus incisus* (Willdenow) Hornemann, Hort. Bot. Hafn. 2: 599. 1815. *Coronopus pinnatus* Hornemann, Hort. Bot. Hafn. 2: 599. 1815. *Senebiera heleniana* DC., Reg. Veg. Syst. Nat. 2: 523. 1821. *Senebiera pectinata* DC., Syst. Nat. 2: 523. 1821. *Coronopus heleniana* (DC.) Sprengel, Syst. Veg. 2: 853. 1825. *Coronopus pinnatifidus* Dulac, Fl. Hautes- Pyrenees 186. 1867. *Coronopus pectinatus* (DC.) Kuntze, Revis. Gen. Pl. 1: 27. 1891. *Coronopus pinnatifidus* F. Meigen, Bot. Jahrb. Syst. 17: 238. 1893. *Crucifera senebiera* E.H.L. Krause, Deutschl. Fl. ed. 2, 6: 160. 1902. *Carara didyma* (Linnaeus) Britton, III. Fl. N. United State ed. 2, 2: 167. 1913. *Coronopus leptocarpus* Boelcke, Darwiniana 19(2-4): 395. 1975.

Ecological notes: The species usually found growing in the semi-shade and open forest areas in evergreen forest of tropical to temperate regions between 600 - 2700 m above mean sea level. The commonly associated plants with *L. didymum* includes *Berberis aristata* DC., *Plantago amplexicaulis* Cavanilles, *Plectranthus rugosus* Wallich, *Potentilla atrosanguinea* G.Loddiges ex D.Don, *Potentilla fulgens* Diels, *Ranunculus diffusus* DC., *Rosa webbiana* Wallich ex Royle, *Rubus alceifolius* Poiret, *Rubia cordifolia* Linnaeus, *Silene falconeriana* Benth, *Swertia petiolata* D.Don, *Trillium govianum* Wallich ex D.Don and several other species.

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