

## WHAT IS COCHLEARIA CONWAYI (BRASSICACEAE)?

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The generic placement of *Cochlearia conwayi* is discussed and the species is transferred to the genus *Pseudocamelina*. The new combination *P. conwayi* is proposed. The generic assignments of *Cochlearia* species described from central, southern, and southwestern Asia are discussed and it is concluded that the genus does not grow in Asia except for the extreme northern part.

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گیاه *Cochlearia conwayi* چیست؟

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جایگاه گیاه *Cochlearia conwayi* مورد بحث قرار می گیرد و این گونه به جنس *Pseudocamelina* انتقال داده می شود. ترکیب جدید *P. conwayi* پیشنهاد می گردد. ویژگی های تعیین کننده گونه های جنس *Cochlearia* که از مرکز، جنوب و جنوب غرب آسیا شرح داده شده اند مورد بحث قرار می گیرند و نتیجه گیری می شود که این جنس در آسیا نمی روید و تنها در شمالی ترین بخش آن حضور دارد.

### INTRODUCTION

During a recent visit to the Royal Botanic Gardens, Kew (K) and the Natural History Museum (BM) to work on the accounts of the family Brassicaceae (Cruciferae) for the World Flora Online and the Pan Himalayan Flora, I had the chance to closely re-examine the holotype of *Cochlearia conwayi* Hemsl. and compare it with members of numerous genera. The species was described from the Karakoram Mountains (Pakistan) well over 120 years ago and despite the fact that the mustards of these mountains were studied fairly critically by Schulz (1927, 1933) and Jafri (1956, 1973), it remained in *Cochlearia* L. to the present.

Schulz (1936) placed *Cochlearia* in the artificially circumscribed tribe Lepidieae, but his generic concept was so broadly delimited that it included species currently assigned to *Aphragmus* Andr. ex DC. (*Aphragmeae*), *Cochlearia* (*Cochlearieae*), *Eutrema* R.Br. (*Eutremeae*), *Pseudosempervivum* (Boiss.) Grossh. (*Coluteocarpeae*), and *Yinshania* Y.C.Ma & Y. Z. Zhao (*Yinshanieae*). However, neither Schulz (1927, 1936) nor Pobedimova (1969, 1970) dealt with *C. conwayi*, whereas Jafri (1973) tentatively retained it in the tribe Lepidieae.

As delimited by Al-Shehbaz (2012) and Koch

(2012), the tribe Cochlearieae consists of two genera, *Cochlearia* and *Ionopsidium* Rchb. and 29 species distributed primarily in Europe, northern North America, and northern Asia (Siberia, Russian Far East, Japan). It is characterized by having glabrous plants with rosulate, undivided basal leaves, usually sessile cauline leaves, white flowers, terete or angustiseptate silicles, and biseriate seeds (Al-Shehbaz et al. 2006). All species originally described as or transferred to *Cochlearia* from the Himalayas and central, southeastern, and southwestern Asia have already been transferred to *Aphragmus* (Warwick et al. 2006), *Camelinopsis* A.G.Mill. (Miller 1978), *Eutrema* (Al-Shehbaz & Warwick, 2005), *Peltariopsis* (Boiss.) N. Busch (Busch 1927), *Pseudocamelina* (Boiss.) N. Busch (Busch 1928; Miller 1978), *Pseudosempervivum* (Pobedimova 1970; Al-Shehbaz et al. 2007), *Rorippa* Scop. (Al-Shehbaz & Jonsell 2000) and *Yinshania* (Al-Shehbaz et al. 1998).

As shown from the description below, *Cochlearia conwayi* has no morphological similarities that support its retention in *Cochlearia*. Features such as the woody caudex, finely trisect and nonfleshy leaves, linear fruits, flexuous stems and racemes, puberulent leaves and stems, and filiform fruiting pedicels, which are

characteristic of this species, are not found individually or in any combination in any species of *Cochlearia*. However, all these features are characteristic of *Pseudocamelina* and no other genus in the family. The latter genus was recognized by Rechinger (1968) to consist of seven species distributed primarily in Iran. However, as shown by Miller (1978) and Appel & Al-Shehbaz (2003), *Pseudocamelina* currently includes only three species endemic to Iran.

The transfer of *Cochlearia conwayi* to *Pseudocamelina* would not alter its generic limits at all. However, it adds a species from Karakoram quite disjunct geographically from the center of diversity of *Pseudocamelina* in Iran. The generic type, *P. glaucophylla* N. Busch has recently been studied by Khosravi et al. (2009) using sequence data from the nuclear-encoded ribosomal internal transcribed spacer (ITS). They placed the genus in the tribe Thlaspidaceae, an assignment followed by Al-Shehbaz (2012) in his family-wide generic and tribal synopsis of the Brassicaceae. However, molecular studies on all the four species of the genus are needed, but the fragmentary nature of the holotype of this species leaves no room to support such studies at the present. Until additional collections of *P. conwayi* are obtained, its current placement in *Pseudocamelina* is by far the best assignment than in any other genus in the family.

### New combination

*Pseudocamelina conwayi* (Hemsl.) Al-Shehbaz, **comb. nov.**  
Basionym: *Cochlearia conwayi* Hemsl., Bull. Misc. Inform. Kew 1894: 4. 1894.

Type: [Pakistan], Expedition to the Karakoram Glaciers 1892, Doyen to Raínghát, W. M. Conway 305 (holotype, K 000247181). For image, see <http://plants.jstor.org/>

Perennial herbs, minutely puberulent throughout with straight, simple papillae to 0.05 mm; caudex woody, few-branched, with leaf and stem remains of previous seasons. Stems ca. 7 cm long, branched from caudex and above, ascending, puberulent, dichotomously branched, strongly flexuous. Basal leaves subrosulate, trisect, 1-2 cm long, puberulent, nonfleshy; lobes linear, entire; middle cauline leaves trisect, petiolate, not auriculate at base; petiole 3-6 mm long; lobes linear to filiform, 3-10 × 0.2-1 mm, entire; uppermost leaves undivided. Racemes 2-5-flowered, lax, strongly flexuous, puberulent, ebracteate; flowering pedicels divaricate, filiform, straight, puberulent, 5-15 mm long. Sepals oblong, 2.5-3 mm long, erect, puberulent, subsaccate at base; petals oblanceolate, apparently white, 5-7 × 0.5-1 mm, undifferentiated into blade and claw; filaments erect, 2-3 mm long, tetradynamous; anthers oblong, ca. 1 mm

long, not apiculate; nectar glands confluent, subtending bases on median stamens, surrounding those of lateral stamens; ovary linear; style ca. 0.5 mm long; stigma entire. Ovule number, fruits and seeds are not known.

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