Towards a clarification in the taxonomy of Sino-Himalayan species of Selinum L. s. l. (Umbelliferae). The genus Oreocome Edgew.

Authors: Pimenov, Michael G., Kljuykov, Eugene V., and Ostroumova, Tatiana A.

Source: Willdenowia, 31(1) : 101-124

Published By: Botanic Garden and Botanical Museum Berlin (BGBM)

URL: https://doi.org/10.3372/wi.31.31109
Towards a clarification in the taxonomy of Sino-Himalayan species of *Selinum* L. s.l. (*Umbelliferae*). The genus *Oreocome* Edgew.

Abstract


*Oreocome*, a genus of Himalayan *Umbelliferae*, which has not been accepted in the majority of regional floristic treatments and whose name was previously lectotypified with *O. candollei*, is re-defined with the help of carpological features. *Oreocome* is considered to comprise six species, distributed from Pakistan to SW China with a centre of diversity in the Himalayas, and it is delimited from both *Selinum* and *Ligusticopsis*. Three new species, viz. *O. involucellata* and *O. depauperata* from Nepal and *O. hindukushensis* from Pakistan, are described as new to science. Four new combinations, two in *Oreocome* (*O. limprichtii*, *O. striata*) and two in *Ligusticopsis* (*L. conifolia*, *L. wallischiana*) are validated. Keys are provided to the accepted species of *Oreocome* and to the Himalayan species of *Ligusticopsis*.

Introduction

*Selinum* is a problematic genus in the flora of both the Himalaya and China. In Central and E Europe and W Siberia it is represented by a single species, *S. carvifolia* (L.) L., which provides the nomenclatural type of the conserved name *Selinum* L. (Greuter & al. 2000: 355). The genus *Selinum* in a broad sense may be considered to have 14 species (Leute 1970, Li & al. 1993, Mukherjee & Constance 1993) but its delimitation from related genera, e.g., *Ligusticum* L., *Ligusticopsis* Leute, *Cortia* DC., *Cortiella* C. Norman, *Conioselinum* Hoffm. and *Cnidium* Cusson ex Juss., is still unsatisfactory. This is illustrated well by the inclusion of no less than 284 species names under *Selinum* in the “Index kewensis” (1997).

During critical evaluation of *Umbelliferae* in the flora of Middle Asia (Pimenov 1975, 1983, Lavrova & al. 1987), three local species of *Selinum* from the W Tianshan Mts were transferred to two new genera. These are *Sphaenolobium* Pimenov and *Karatavia* Pimenov & Lavrova, the latter being probably neither closely related to European *Selinum* nor to the *Selinum-Ligusticum* group, the “Verwandtschaftskreis der Gattung *Ligusticum* L.” of Leute (1969-70), as a whole. More recently, another Asiatic species from W Himalaya, *Selinum papyraceum* C. B. Clarke, has been transferred to *Conioselinum* (Pimenov & Kljuykov 1999). The majority of remaining spe-
cies of Selinum are concentrated in the Himalaya and adjacent regions of China. Some of them are critical even at species level (see Mukherjee & Constance 1993, Watson 1998) but there is in particular considerable disagreement about the generic treatment of the Sino-Himalayan species of the Selinum-Ligusticum group (see Edgeworth 1845, 1846, Clarke 1879, Hiroe 1958, 1979, Leute 1969, 1970, Nasir 1972, Cannon 1979, Chang 1985, Hedge & Rechinger 1987, Mukherjee & Constance 1993). Today, only Cortia and Cortiella, but not Oreocome, are widely accepted as separate endemic Himalayan genera within the Selinum-Ligusticum group. This contribution focuses on the Sino-Himalayan species connected with the generic name Oreocome Edgew.

**Taxonomic history of Oreocome**

Oreocome was described in two subsequent publications by Edgeworth (1845, 1846). The publication dates of both papers had been disputed (1845, 1846 or 1849 for the first, 1846, 1849 or 1851 for the second) but were established (pers. comm. Prof. Dan H. Nicolson) by Raphael (1970). Accordingly, Edgeworth’s short paper with the protologue of Oreocome was published in 1845, the enlarged one in 1846. The paper of 1845 contains a short description of Oreocome and of two new species, O. elata and O. filicifolia. Selinum candollei DC. ["candollii"], Peucedanum wallichianum DC. and Pleurospermum cicutarium Lindl. are explicitly referred to the new genus but their binomials in Oreocome are not validated. The paper of 1846 repeats the diagnoses of the new genus and of the two new species, and supplements it by enlarged descriptions, reference to specimens and addition of other species of the genus. These other species are the same as in the first publication: S. candollei (Peucedanum wallichianum and S. tenuifolium are regarded as synonyms) and Pleurospermum cicutarium; this time, however, the combinations O. candollei [incorrectly given as “O. candollianum” (Edgeworth 1846: 55)] and O. cicatitaria (Edgeworth 1846: 56, footnote) are validated. Recently, Pimenov & Leonov (1993) selected Selinum candollei DC. (≡ O. candollei ["candollianum"] (DC.) Edgew.) in accordance with Art. 10.2 and 10.3 of the Code (Greuter & al. 2000) as the lectotype of the generic name Oreocome. This lectotypification was incorporated with corrected spelling in the authoritative ING database (Farr & Zijlstra 1996).

Currently, Oreocome is a little known generic name. Apart from the aforementioned references concerned with the typification of the generic name only Farille & al. (1985) maintained Oreocome, adding a new species, O. stelliphora Cauwet & Farille, which was later, however, transferred to the new genus Oreocomopsis Pimenov & Kljuykov (1996).

Already Clarke (1879) did not accept Oreocome as a separate genus. He included Edgeworth’s four Oreocome species in Selinum and merged them all with S. tenuifolium Wall. ex C. B. Clarke, of which he recognized three varieties. Besides S. tenuifolium proper (with the synonyms “S. candollii Edgew. non DC.” [i.e. actually O. candollei (DC.) Edgew.], Peucedanum wallichianum DC. and Pleurospermum cicutarium Lindl. [= O. cicatitaria (Lindl.) Edgew.]), Clarke (1879) distinguished var. filicifolia (Edgew.) C. B. Clarke (= Oreocome filicifolia Edgew. ≡ Ligusticum conifolium DC.) and var. elata (Edgew.) C. B. Clarke (= Oreocome elata Edgew.). Altogether he maintained five (plus one doubtful) species of Indian Selinum. Clarke (1879: 699) emphasized the similarity in all accepted species of Selinum (“the Indian species are uniform in habit ...”) and distinguished them from local Ligusticum species by the number of vittae in the mericarp furrows: “dorsal furrows 1-vittate (or rarely 1 large deep-seated and 2 small lateral superficial or 0), lateral furrows 1-4-vittate” in Indian Selinum, but “dorsal furrows at least 2-vittate, lateral at least 3-vittate” in Ligusticum (Clarke 1879: 699). It is clear that he had some difficulties distinguishing these two genera on Indian material. Clarke’s sixth, doubtful species, S. dissectum (DC.) C. B. Clarke, first had appeared in Wallich’s “Catalogue” as nomen nudum before it was validly described as Peucedanum dissectum DC. on the basis of the collection Wallich 581 from Gossain Than (Nepal). Its identity has remained doubtful up to now (Mukherjee & Constance 1993, Watson 1998) and Watson (1998) pointed out that the problems of its identity start with the original material: Wallich’s collections were not rarely distributed.
without numbers or, on the contrary, with the same number for different species, or with sheets containing more than one species. Moreover, *Peucedanum dissectum* DC. (1830), the basionym of *S. dissectum*, is an illegitimate later homonym of *P. dissectum* Ledeb. (1829), the basionym of *Ferula dissecta* (Ledeb.) Ledeb.

Leute (1969-70) accepted a rather broad concept of *Selinum*, including *Cnidium* Cusson ex Juss. The most essential, if not only difference between *Selinum* sensu Leute and *Ligusticum* is the number of vallecular vittae (“vittae valleculares singulae” versus “vittae valleculares numerosae”). As a result, *Selinum* in Leute’s monograph consists of 10 accepted species while 11 other names are listed under “species incertae sedis” and three are transferred to the genus *Tilingia*. He transferred all Sino-Himalayan species of *Selinum* to *Cortia* DC., validating some new combinations in *Cortia*, viz. *C. candollei* (DC.) Leute, *C. wallichiana* (DC.) Leute, *C. papyracea* (C. B. Clarke) Leute and *C. striata* (DC.) Leute. *C. vaginata* Edgew. was accepted by Leute in this genus. Edgeworth’s *Oreocome* species were again all merged in one species, *C. wallichiana* (DC.) Leute (= *Peucedanum wallichianum* DC.). Later, Hedges & Rechinger (1987) followed Leute in treating *Selinum wallichianum*, *S. vaginatum* and *S. papyracea* as species of *Cortia*.

Nasir (1972) in his treatment of the *Umbelliferae* for Pakistan largely followed Clarke (1879) but regarded *Selinum candollei*, *S. wallichianum* and *S. filicifolium* (Edgew.) Nasir as separate species. He characterized *S. filicifolium* by broader marginal than dorsal mericarp ribs, thus being closer to *S. wallichianum* than to *S. candollei* in this character.

Cannon (1979: 189) on the contrary, expressed the view that *Selinum tenuifolium var. filicifolium* “does not merit recognition, except perhaps at the rank of forma”. At the same time he included *Peucedanum wallichianum* into *S. candollei* and regarded *S. cortioides* C. Norman and *S. striatum* as separate species, the latter, however, expecting to be perhaps conspecific with *S. tenuifolium*. A similar observation was made for *S. candollei*, and in general, according to Cannon, “a complete revision of the genus is needed for clarification”.

Only three species of *Selinum* were reported for China by Chang (1985), viz. *S. cryptotaenium* H. Boissieu, *S. candollei* DC. and *S. cortioides*; *Peucedanum wallichianum* and *S. tenuifolium* were regarded as synonyms of *S. candollei*. Later, two further Chinese species, previously described as *Cnidium sinkchianum* and *C. nullivittatum* (Fu 1981), were transferred to *Selinum* (Li & al. 1993), probably under the influence of Leute’s concept. These two northerly species with a very peculiar morphology are distributed in the Chinese provinces of Shanxi and Henan and are not subject of the present paper. At least, they are not closely related to *Oreocome*.

In the recent revision of Indian species of the *Selinum-Ligusticum* group by Mukherjee & Constance (1993), the authors correctly note that generic delimitation between Indian species of *Selinum* and *Ligusticum* is rather problematic and that both are distant from the nomenclatural types of their generic names. *Cnidium* (*C. monnieri*) is regarded as an independent genus. In other respects this revision is more or less conservative. Seven species are accepted in *Selinum* and five in *Ligusticum*. Of interest in our context is the treatment of *S. candollei*, *S. wallichianum* and *S. elatum*: the latter is accepted as a separate species, *O. filicifolia* is referred to the synonymy of *S. wallichianum* and “O. candolliana” to the synonymy of *S. candollei*. The majority of the aforementioned names are placed in the synonymy of *S. wallichianum*.

Watson’s (1998, 1999) treatment of the *Umbelliferae* of Bhutan (E Himalaya) comprises discussions also on some species of *Selinum* and related genera. He, in particular, elaborated differences between *S. candollei* and *S. wallichianum*, the most essential and reliable among them being the degree of the development of the marginal mericarp ribs. Watson also lectotypified some of the names of local species.

**Material and methods**

KUN, LE, NAS, P, PE (abbreviations according to Holmgren & al. 1990). Morphological investigation and ecological observation of Himalayan species of the Selinum-Ligusticum group were also made in their natural habitats during our excursions to Nepal and the W Himalaya in 1999 and 2000. Field studies proved to be especially important since the species are mostly big plants and sometimes grow together with similar taxa. Species are represented in herbaria therefore often by mixed or inadequate gatherings, e.g. only comprising the tops of such big plants, or lacking fruits, etc. A most valuable background for the study of the Himalayan taxa constituted our own herbarium collections of and field observations on Chinese species of the Selinum-Ligusticum group made in Sichuan and Yunnan between 1996 and 1998.

Due to their eminent taxonomic importance we focused our studies on morphological and anatomical features of the mericarps, employing standard techniques. Unfortunately, we had no reliable material of Oreocome filicifolia. For comparison the fruits of Ligusticum gyirongense were studied too. The following taxa and specimens were carpologically investigated:

Ligusticopsis brachyloba (Franch.) Leute: China, coteaux calcearais au pied du Yang-in-chan (Lankong), 15.9.1885, Delavay 2027 (P, syntype).
Oreocome candollei (Wall. ex DC.) Edgew.: (1) In montibus Nepaliae, ad Kamaon [Napoliae montis], 1821, Wallich [582] (G-DC, lectotype); (2) E Himalaya, Central Nepal, south slopes of Annapurna mountain massif, valley of Modi Khola, right bank, between Doban (Dovan) and Himalaya Hotel, 28°28’N, 83°52’E, 2700 m, 22.10.1999, Pimenov & Kljuykov 12 (MW).
O. elata Edgew.: (1) India, Punjab, Simla, 1884, Drummond 1608 (LE, det. C. B. Clarke); (2) India, Himachal Pradesh, Kullu distr., Pir Panjal Range, S slope of Rohtang Pass, Kothi, 32°19’N, 77°10’E, 2740 m, 26.8.2000, Pimenov & Kljuykov, 13 & 15 (MW).
O. hindukushensis Pimenov & Kljuykov: Pakistan, E-Hindukush, Sai Valley, Picea smithiana forest, 3100 m, 1.9.1993, Schickhoff 2035 (GOET, holotype).
O. depauperata Pimenov & Kljuykov: Nepal, Wangang (Ronnz distr.), 1660 m, 17.10.1977, Manandhar 421 (KATH, holotype).
S. cosifolium (DC.) Benth. (Syn.: Oreocome cicataria (Lindl.) Edgew., O. filicifolia Edgew.): India, Himachal Pradesh, Kullu distr., Pir Panjal Range, southern slope, Rohtang Pass, 6 km below near Marrhi, 32°20’N, 77°13’E, 3300 m, 27.8.2000, Pimenov & Kljuykov 21 (MW).
S. striatum (DC.) Benth.: (1) Himalaya, Central Nepal, Langtang National Park, basin of Trisuli Khola, between Dunchhe and Sing Gompa, 28°07’N, 85°20’E, 1900 m, 31.10.1999, Pimenov & Kljuykov 27 (MW); (2) Nepal, ad argos alyzaceous convallis Nepaliae magnae, 1821, Wallich [583] (G-DC, lectotype).
S. wallichianum (DC.) Raizada & H. O. Saxena: (1) Nepal, in monto Emodo ad Kamaon & Gosain- Than [Emody ad Gossain Than], Wallich 579 (G-DC, lectotype); (2) E Himalaya, Central Nepal, S slopes of Annapurna mountain massif, valley of Modi Khola, right bank, between Doban (Dovan) and Himalaya Hotel, 28°28’N, 83°52’E, 2700 m, 22.10.1999, Pimenov & Kljuykov 19 (MW).
Results

The results of our morphological and carpological studies in Sino-Himalayan species of the Selinum-Ligusticum group related to the generic name Oreocome are summarized in Table 1. The mericarp anatomy of the species investigated is illustrated in Fig. 1-18, the petiole anatomy in Fig. 19-23.

Selinum vaginatum Edgew. showed a quite different fruit structure (for instance, its fruits have no vallecular and commissural vittae). It was therefore excluded from this study and will be regarded later separately. S. papyraceum C. B. Clarke was already transferred to Conioselinum (Pimenov & Kljuykov 1999).

Results of the carpological studies

Selinum carvifolia (L.) L. and Oreocome candollei (Wall. ex DC.) Edgew.

The first challenge is the comparison of the Sino-Himalayan Selinum species with S. carvifolia, which provides the type of the generic name Selinum. Their similarity in leaf structure is obvious, having been a basis for the attribution of the Himalayan species to Selinum. Leaf characters are not, however, reliable in Umbelliferae taxonomy, especially for generic classification.

Although the taxonomically more reliable carpo-anatomy was studied in Selinum carvifolia more than once (Thellung 1926, Klan 1947, Leute 1970, Lavrova & al. 1983, etc.), it needed some refining. Our studies of the mericarps of S. carvifolia (Fig. 1-2) revealed the following features: mericarps elliptic, slightly compressed dorsally, 3.2-4.5 mm long, 2.5-3.5 mm broad, 0.8 mm thick, mericarp cavity 1.1-1.3 mm broad; stylopodium conical, styles 1.2-1.7 mm long, reflexed on the dorsal side of the mericarp; calyx teeth absent; dorsal ribs winged, 0.2-0.4 mm wide, marginal ribs broadly winged, 1.0-1.1 mm wide; secretory ducts 1-3 per vallecula and 3-5 on the commissural face; exocarp c. 10 µm thick, unilayered, covering the ventral mericarp face up to the carpophore (commissure very narrow); vascular bundles sclerified, stretched radially, occupying most of the ribs; endocarp 8-15 µm thick; commissural face of endosperm flat or slightly convex.

Oreocome candollei is rather similar to Selinum carvifolia in mericarp morphology, its mericarp anatomy, in contrast, reveals some essential differences, particularly in the width of the commissure and the fibro-vascular structure of the ribs (Fig. 3-4): mericarps elliptic, strongly compressed dorsally, 5-6 mm long, 3.5-4.5 mm broad, 0.7-1.4 mm thick, mericarp cavity 2.1-2.2 mm broad; stylopodium short-conical, styles 0.5 mm long, reflexed on the dorsal side of the mericarp; calyx teeth acute, lanceolate-triangular or lanceolate-linear, shorter than stylopodia; dorsal ribs winged, 0.2-0.7 mm wide, marginal ribs broadly winged, 0.9-1.2 mm wide; secretory ducts 1-3 per vallecula and 3-5 on the commissural face; exocarp 8 µm thick, often compressed, interrupted near the commissural ducts (commissure rather narrow); vascular bundles situated at the bases of the ribs, distal part of marginal ribs composed of lignified parenchyma cells with pitted walls; endocarp compressed; commissural face of endosperm flat or slightly concave.

Apart from the carpo-anatomical differences, Selinum carvifolia and Oreocome candollei also differ in other features: the calyx teeth are long, lanceolate-triangular or linear-lanceolate in O. candollei, as it was first noted by Edgeworth, but are completely absent in S. carvifolia. Less significant but clear differences show the stem structure. The stems in S. carvifolia have numerous prominent, thinly winged ribs in their lower part whereas the stems of O. candollei do not have them.

Oreocome elata Edgew. (= Selinum elatum (Edgew.) M. Hiroe)

Mericarps (Fig. 5) elliptic, strongly compressed dorsally, 6.2-8.5 mm long, 4.5-6.0 mm broad, 1.2-1.5 mm thick; mericarp cavity 2.4-3.0 mm broad; stylopodium short-conical, styles c. 1 mm long, reflexed on dorsal side; calyx teeth lanceolate to lanceolate-linear, approximately equalling the stylopodia; dorsal ribs winged, 0.6-0.7 mm wide, marginal ribs broadly winged, 1.3-1.6 mm
Table 1. Synopsis of the carpological data of the species of the Sino-Himalayan Selinum-Ligusticum group related to the generic name Oreocome. Measurements are in millimetre unless otherwise stated.

<table>
<thead>
<tr>
<th></th>
<th>Selinum carvifolia (Fig. 1-2)</th>
<th>Oreocome candollei (Fig. 3-4)</th>
<th>Oreocome elata (Fig. 5)</th>
<th>Selinum striatum (Fig. 6-8)</th>
<th>Ligusticum gyirongense (Fig. 9)</th>
<th>Selinum wallichianum (Fig. 10)</th>
<th>Selinum cryptotaurium (Fig. 15)</th>
<th>Oreocome hindukushensis (Fig. 16)</th>
<th>Oreocome involucellata (Fig. 17)</th>
<th>Oreocome depauperata (Fig. 18)</th>
<th>Selinum coniifoliu (Fig. 13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mericarp shape</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
<td>elliptic</td>
</tr>
<tr>
<td>dorsal compression</td>
<td>slight</td>
<td>strong</td>
<td>strong</td>
<td>slightly</td>
<td>strongly</td>
<td>slightly</td>
<td>slightly</td>
<td>strongly</td>
<td>slightly</td>
<td>slightly</td>
<td>strong</td>
</tr>
<tr>
<td>size</td>
<td>3.2-4.5 × 2.5-3.5</td>
<td>5.8 × 3.5-5.5</td>
<td>6.2-8.5 × 4.5-6.0</td>
<td>2.9-4.0 × 1.4-2.0</td>
<td>3.2 × 1.9</td>
<td>4.0-4.6 × 3.3-3.8</td>
<td>4.5-6.6 × 2.3-4.6</td>
<td>4.5 × 2.7</td>
<td>4.6-5.0 × 2.8</td>
<td>—</td>
<td>5 × 3.5-4</td>
</tr>
<tr>
<td>thickness</td>
<td>0.8</td>
<td>0.7-1.4</td>
<td>1.2-1.5</td>
<td>0.8-1.0</td>
<td>1.0</td>
<td>0.6-0.9</td>
<td>0.9-1.1</td>
<td>1.0</td>
<td>1.2</td>
<td>—</td>
<td>1.0</td>
</tr>
<tr>
<td>cavity width</td>
<td>1.1-1.3</td>
<td>2.1-3.2</td>
<td>2.4-3.0</td>
<td>1.4</td>
<td>1.4</td>
<td>1.7-2.0</td>
<td>2.1</td>
<td>1.6</td>
<td>1.3</td>
<td>—</td>
<td>2.0</td>
</tr>
<tr>
<td>Dorsal ribs shape</td>
<td>narrow-winged</td>
<td>narrow-winged</td>
<td>winged</td>
<td>keeled or slightly winged</td>
<td>keeled</td>
<td>keeled</td>
<td>slightly winged</td>
<td>narrow-winged</td>
<td>winged</td>
<td>Winged</td>
<td>keeled</td>
</tr>
<tr>
<td>width</td>
<td>0.2-0.4</td>
<td>0.2-0.7</td>
<td>0.6-0.7</td>
<td>0.2-0.4</td>
<td>0.2-0.3</td>
<td>0.1-0.2</td>
<td>0.2-0.5</td>
<td>0.2-0.5</td>
<td>0.6-0.8</td>
<td>—</td>
<td>0.3-0.4</td>
</tr>
<tr>
<td>Marginal ribs shape</td>
<td>winged</td>
<td>winged</td>
<td>equaling as dorsal ribs</td>
<td>slightly winged</td>
<td>winged</td>
<td>winged</td>
<td>winged</td>
<td>winged</td>
<td>winged</td>
<td>broader than dorsal</td>
<td>winged</td>
</tr>
<tr>
<td>width</td>
<td>1.0-1.1</td>
<td>0.9-1.2</td>
<td>1.3-1.6</td>
<td>0.3-0.6</td>
<td>0.4</td>
<td>0.8-1.0</td>
<td>1.2-1.4</td>
<td>0.5-0.7</td>
<td>0.9-1.2</td>
<td>—</td>
<td>0.9-1</td>
</tr>
<tr>
<td>Vittae per vallecula</td>
<td>1-3</td>
<td>1-3</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
<td>1-3</td>
<td>1-2</td>
<td>1</td>
<td>2-3</td>
<td>2-3</td>
<td>1-3</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>---</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Commissural vittae</td>
<td>3-5</td>
<td>3-5</td>
<td>2-4</td>
<td>2-4</td>
<td>3-4</td>
<td>2-6</td>
<td>1-2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Exocarp [µm]</td>
<td>c. 10, unilayered</td>
<td>8, often compressed</td>
<td>thin, often compressed</td>
<td>thin</td>
<td>thin</td>
<td>10-20</td>
<td>thin</td>
<td>thin, slightly lignified</td>
<td>thin</td>
<td>thin</td>
<td></td>
</tr>
<tr>
<td>Commissure width</td>
<td>very narrow (exocarp covering ventral face of mericarp up to carpophore)</td>
<td>rather narrow (exocarp interrupted near commissural ducts)</td>
<td>very narrow (exocarp interrupted near carpophore)</td>
<td>rather narrow (exocarp interrupted near commissural ducts)</td>
<td>very broad (exocarp only edges of marginal ribs)</td>
<td>rather narrow (exocarp interrupted near carpophore)</td>
<td>very narrow (exocarp covering ventral face of mericarp up to carpophore)</td>
<td>very narrow (exocarp covering only edges of marginal ribs)</td>
<td>very narrow (exocarp covering ventral face of mericarp up to carpophore)</td>
<td>very narrow (exocarp covering ventral face of mericarp up to carpophore)</td>
<td>very narrow (exocarp covering only edges of marginal ribs)</td>
</tr>
<tr>
<td>Vascular bundles</td>
<td>sclerified, stretched radially, occupying the most of the ribs at the rib bases, marginal ribs distally of lignified parenchyma cells with pitted walls</td>
<td>at the rib bases, mesocarp in ribs and valleculas mainly of lignified parenchyma cells with pitted walls near the rib bases, mesocarp in distal parts of ribs sometimes of lignified parenchyma cells with pitted walls</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
<td>at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases, at the rib bases,</td>
</tr>
<tr>
<td>Endocarp [µm]</td>
<td>8-15</td>
<td>compressed</td>
<td>thin</td>
<td>thin</td>
<td>thin</td>
<td>4-5</td>
<td>thin</td>
<td>thin</td>
<td>thin</td>
<td>thin</td>
<td>thin</td>
</tr>
<tr>
<td>Endosperm commissural face</td>
<td>flat or slightly concave</td>
<td>flat or slightly concave</td>
<td>slightly concave</td>
<td>flat or slightly concave</td>
<td>flat</td>
<td>slightly concave</td>
<td>flat</td>
<td>slightly concave</td>
<td>flat</td>
<td>slightly concave</td>
<td>flat</td>
</tr>
</tbody>
</table>
Fig. 1-5. Transects of mericarps – 1-2: *Selinum carvifolia*, Kljuykov (MW), dorsal rib (1); schematic transect (2); 3-4: *Oreocome candollei*, Wallich 582 (G-DC), schematic transect (3), dorsal rib (4); 5: *Oreocome elata*, Drummond 1608 (LE), schematic transect. – Scale bars: 1 + 4 = 0.1 mm; 2-3 + 5 = 1 mm; abbreviations: cav = cavity, cr = crushed cells, dc = commissural secretory ducts, df = secretory ducts in furrows, dr = small secretory duct in distal part of rib, ec = endocarp, es = endosperm, ex = exocarp, pp = parenchyma cells with lignified pitted walls, sc = seed coat, vb = vascular bundles.
wide; secretory ducts 1-2 in the valleculas and 2-4 on the comissural face; exocarp thin, often compressed, interrupted near the carpophore (commissure very narrow); vascular bundles situated at the bases of the ribs, mesocarp in ribs and valleculas composed mainly of lignified parenchyma cells with pitted walls; endocarp thin; commissural face of the endosperm slightly concave.

In all essential characters the fruits of *Oreocome elata* are thus similar to those of *O. candollei*.

**Selinum striatum** (DC.) Benth.

Mericarps (Fig. 6-8) elliptic, slightly compressed dorsally, 2.9-4.0 mm long, 1.4-2.0 mm broad, 0.8-1.0 mm thick, mericarp cavity 1.4 mm broad; stylododium short-conical to conical, styles 0.6 mm, reflexed on the dorsal side of the mericarp; calyx teeth lanceolate, approximately equaling the stylopodia; dorsal and marginal ribs keeled or slightly winged, almost equal, dorsal ribs 0.2-0.4 mm wide, marginal ribs 0.3-0.6 mm wide; secretory ducts 1-2 per vallecula and 2-4 on the commissural face; small ducts present distally of the vascular bundles; exocarp thin, interrupted near the commissural ducts (commissure rather narrow); vascular bundles situated near the rib bases, mesocarp in distal parts of the ribs sometimes composed of lignified parenchyma cells with pitted walls; endocarp thin; commissural face of the endosperm flat or slightly concave.

Mericarp morphology and anatomy of *Selinum striatum* clearly correspond to *Oreocome elata*.
Ligusticum gyirongense R. H. Shan & H. T. Chang

Ligusticum gyirongense was described from S Xizang, near to Nepalese border. The type locality (Gyirong) is situated in the valley of the Kyirong river, named Bhote Khosi on the Nepalese territory. Our collection of Selinum striatum from Nepal (near Dhunche) was made near the junction of this river with Trisuli Khola, approximately 40 km from the locus classicus of L. gyirongense. Comparing the descriptions of S. striatum and L. gyirongense we did not find any essential difference. This was confirmed by the study of the type material of L. gyirongense.

Mericarps (Fig. 9) elliptic, slightly compressed dorsally, 3.2 mm long, 1.9 mm broad, 1.0 mm thick, mericarp cavity 1.4 mm broad; stylopodium short-conical, styles 0.5 mm, reflexed on the dorsal side of the mericarp; calyx teeth lanceolate, acute, equalling the stylopodium; dorsal ribs keeled, 0.2-0.3 mm wide, marginal ribs slightly winged, 0.4 mm wide; secretory ducts 1-2 per vallecula and 3-4 on the commissural face; exocarp thin, interrupted near the commissural ducts (commissure rather narrow); vascular bundles located at the rib bases, lignified parenchyma cells with pitted walls scanty; endocarp thin; commissural face of the endosperm slightly concave.

Also in mericarp features Selinum striatum and Ligusticum gyirongense are very similar if not completely identical. Their description and consequent treatment in different genera reflect the artificial taxonomic dichotomy between Ligusticum and Selinum in vallecular vittae number (actually this number varies in numerous species, including S. striatum). This character has been adopted by many Umbelliferae taxonomists, beginning probably with Clarke, although he observed some variability in the mericarp secretory system of Himalayan Selinum species. Small differences between the two taxa may be treated as infraspecific, and so we regard L. gyirongense as a later synonym of S. striatum.

Selinum wallichianum (DC.) Raizada & H. O. Saxena

Whereas the fruits of Selinum elatum and S. striatum (incl. Ligusticum gyirongense) correspond in all essential features with S. candollei, S. wallichianum shows clear differences.

Mericarps (Fig. 10) elliptic, strongly compressed dorsally, 4.0-4.6 mm long, 3.3-3.8 mm broad, 0.6-0.9 mm thick, mericarp cavity 1.7-2.0 mm broad; stylopodium short-conical, styles 0.7 mm long, reflexed on the dorsal side of the mericarp; calyx teeth linear, longer than stylopodia; dorsal ribs keeled, 0.1-0.2 mm wide, marginal ribs broadly winged, 0.8-1.0 mm wide; secretory ducts 1-3 per vallecula and 2-6 on the commissural face; exocarp 10-20 µm thick, covering only edges of marginal ribs (commissure very broad); vascular bundles located at the bases of ribs, distal part of marginal ribs composed of lignified parenchyma cells with pitted walls; endocarp 4-5 µm thick; commissural face of the endosperm flat or slightly concave.

As was noted repeatedly by many authors, starting with A. de Candolle, who described it under Peucedanum, to contemporary colleagues, S. wallichianum has dorsally strongly compressed fruits with distinctly unequal dorsal and marginal ribs, the latter being broadly winged and thickened near their distal ends. Our analysis adds relevant characters such as the commissure width: the exocarp of S. wallichianum is interrupted near the distal ends of the marginal ribs, in contrast to the narrower commissure in S. candollei, S. striatum and S. elatum. Moreover, the vittae in the mericarp valleculae are not usually solitary [(1) 2-3] and the calyx teeth are longer than the stylopodia.

This fruit type corresponds to that of Ligusticopsis, a genus previously treated as endemic to China, rather than to Oreocome. Later some species of Ligusticopsis were returned back to Ligusticum (Pu 1991) and the genus has been disputed. It has, however, to be emphasized that no essential differences exist between the Ligusticopsis species and S. wallichianum, neither in carpological nor in other features. The closest relatives of S. wallichianum are L. brachyloba, which is confirmed by strong similarity in fruit anatomy (Fig. 11), and L. dielsiana (H. Wolff) Pimenov & Kljuykov (= Ligusticum rechingerana Leute) (Fig. 12), which provides the type of the generic name Ligusticopsis.
Fig. 10-18. Transect of mericarps – 10: Selinum wallichianum, Pimenov & Kljuykov 19 (MW); 11: Ligusticopsis brachyloba, Delavay 2027 (P); 12: Ligusticopsis dielsiana, Pimenov & Kljuykov 329 (MW); 13: Ligusticopsis contifolia, Pimenov & Kljuykov 21 (MW); 14: Oreocome limprichtii, Pimenov & Kljuykov 552 (MW); 15: Selinum cryptotaenium, Delavay 6722 (P); 16: Oreocome hindukushensis, Schickhoff 2035 (GOET); 17: Oreocome involucellata, Pimenov & Kljuykov 39 (MW); 18: Oreocome depauperata, Manandhar 421 (KATH). – Scale bar: 1 mm; for the abbreviations see caption of Fig. 1-5.
**Selinum coniifolium** (DC.) Benth. (= *Oreocome cicutaria* (Lindl.) Edgew., *O. filicifolia* Edgew.)
The western vicariant of *Selinum wallichianum*, known in old taxonomic and floristic literature as *Oreocome cicutaria* (Lindl.) Edgew. or *O. filicifolia* Edgew., was frequently observed and collected by us in Himachal Pradesh and Uttar Pradesh during our trip in 2000.

Mericarps (Fig. 13) elliptic, strongly compressed dorsally, 5.0 mm long, 3.5-4.4 mm broad, 1.0 mm thick, mericarp cavity 2.0-2.2 mm broad, with distinctly unequal dorsal and marginal ribs, the latter broadly winged, 0.9-1.0 mm wide, but not thickened distally. Commisure very broad, exocarp interrupted near the distal ends of the marginal ribs. Secretory ducts in dorsal valleculae usually solitary, in lateral ones 2-3, and 6 on the commissural side. Calyx teeth longer than the stylodinia; stylodinium short-conical, styles 1.0-1.1 mm long, reflexed on the dorsal side of the mericarp.

The mericarp features correspond to *Selinum wallichianum* and are of the *Ligusticopsis* type. The correct name of this species under *Ligusticopsis* is *L. coniifolia* (see below).

**Selinum cryptotaenium sensu Chang (1985) and sensu typi**
*Selinum cryptotaenium*, as illustrated in the “Flora RP Sinicae” (Chang 1985), is similar to *Oreocome candollei* in most characters. We collected material, concurring with this illustration, in Yunnan, near Lijiang in the Yulong Shan Mts and near Tali, in the Diancang Shan Mts. The species is apparently widespread in that province and, probably, in the adjacent parts of Sichuan and Guizhou. It is closely related to but not identical with Nepalese populations of *O. candollei*, differing from the latter in the absence of bracts and entirely smooth stems (the stem in *O. candollei* is slightly ribbed).

Mericarps (Fig. 14) elliptic to ovate, more or less compressed dorsally, 4.0-5.6 mm long, 2.3-4.6 mm broad, 0.9-1.1 mm thick, mericarp cavity 2.1 mm broad; stylodinium short-conical, styles 0.5-1 mm, straight; calyx teeth linear to linear-lanceolate, shorter than stylodinia; dorsal ribs slightly winged, unequal to each other, 0.2-0.5 mm wide, marginal ribs considerably broader, winged, 1.2-1.4 mm wide; secretory ducts 1-2 per vallecula and 4 on the commissural face; exocarp thin, interrupted near the commissural ducts (commisural rather narrow); vascular bundles located at the bases of the ribs, lignified parenchyma cells with pitted walls in distal parts of the ribs; endocarp thin; commissural face of the endosperm flat.

The fruit structure is thus clearly of the same type as in *Oreocome candollei* (though the marginal ribs in Chinese material are wider than the dorsal).

*Selinum cryptotaenium* sensu Chang (1985) differs, however, fundamentally from the holotype of this name kept in P. Fruit anatomy of *S. cryptotaenium* sensu typi (Fig. 15) is similar to that of *S. wallichianum* and of the *Ligusticopsis* type, although there are some secondary differences in the lignification of mesocarp parenchyma (perhaps an artefact due to fruit damage). The combination in *Ligusticopsis* was already validated by Lavrova (1998). The species is, however, very closely related to *L. brachyloba* (Franch.) Leute and probably conspecific with it. *Selinum candollei* sensu Chang (1985) (including *S. wallichianum*) is also similar to *L. brachyloba* in leaf dissection and general fruit outline and differs from true *O. candollei* essentially in mericarp anatomy, the slightly developed dorsal ribs and some other features.

According to our investigation, *Selinum cryptotaenium* sensu Chang (1985), in contrast, is identical with *Ligusticum limprichtii* H. Wolff (1922), described on the basis of *Limpricht 1053* from Yunnan near Tali. The holotype deposited in Berlin was destroyed during World War II but the rather precise description matches very well the characters of our collection from the same place made in 1998. Also connected with this taxon is the binomial *Pleurospornum glaucescens* H. Wolff, recently transferred to *Ligusticopsis* by Kljuykov & Lavrova (1994). At that time, the mature fruits could not be studied since the type material comprises only fruits in an early stage of development. The comparison of the type of *P. glaucescens* with our collections from Lijiang and Tali (see above) showed their complete identity in all other characters. Thus the correct name for *S. cryptotaenium* sensu Chang (1985) from Yunnan is *L. limprichtii* with *P. glaucescens* as a later synonym.
Further, hitherto undescribed species
Among rich Himalayan and Tibetan collections from German expeditions to High Asia made in the 1970-90s and kindly sent us by Prof. G. Miehe and Dr B. Dickore, we discovered a taxon from the E Hindukush similar to Selinium candollei, which differs, however, by the presence of unusually long, filiform, reflexed calyx teeth.

Mericarps (Fig. 16) elliptic, slightly compressed dorsally, 4.5 mm long, 2.7 mm broad, 1.0 mm thick, mericarp cavity 1.6 mm broad; stylodium short-conical, styles 1.5 mm long, straight or reflexed on the dorsal side of mericarp; calyx teeth filiform, reflexed in fruit, longer than stylodia; dorsal ribs narrow-winged, unequal, 0.2-0.5 mm wide, marginal ribs winged, 0.5-0.7 mm wide; secretory ducts in the valleculas solitary, 4 on the commissural face; exocarp thin, slightly lignified, interrupted near the carpophore (commissure very narrow); vascular bundles located at the bases of the ribs, distal part of the ribs composed of lignified parenchyma cells with pitted walls; endocarp thin; commissural face of the endosperm slightly concave.

The mericarp features clearly match the Oreocome type of the fruit. The species is described below as O. hindukushensis.

A second species not matching any of the known species we collected in Nepal. Is differs from the sympatric Selinium candollei, S. striatum and S. wallichianum in prominent oblanceolate, sometimes toothed bracteoles and in leaf dissection.

Mericarps (Fig. 17) elliptic, slightly compressed dorsally, 4.6-5.0 mm long, 2.8 mm broad, 1.2 mm thick, mericarp cavity 1.3 mm broad; stylodium short-conical, styles 1.0 mm long, reflexed on the dorsal side of the mericarp or straight; calyx teeth lanceolate, narrow; dorsal ribs winged, 0.6-0.8 mm wide, marginal ribs broader, winged, 0.9-1.2 mm; secretory ducts 2-3 per vallecula and 4 on the commissural face; small ducts present distally of the vascular bundles; exocarp thin, interrupted near the commissural ducts (commissure rather narrow); vascular bundles located at the bases of the ribs, lignified parenchyma cells with pitted walls occupying the distal parts of the ribs; endocarp thin; commissural face of the endosperm flat or slightly concave.

The mericarp anatomy thus is of the Oreocome type too.

A third new species from W Nepal, closely related to latter and very similar to it in fruit anatomy (Fig. 18), was found among the herbarium collections kept in KATH. Its description is given below.

Results of studies of the petiole anatomy
Features of the petiole anatomy have some value in the Umbelliferae taxonomy. However, homoplasies are frequent within and among genera. The petioles of Selinium carvifolia have been described previously (Lavrova & al. 1982). For comparison we studied Oreocome candollei, O. striata, O. involucellata, O. limprichtii and S. wallichianum (Fig. 19-23). All these species, including S. carvifolia, have similar petioles: they are fistulose with peripherical vascular bundles and corresponding collenchyma columns. Differences were observed only in the relative size of the central cavity (comparatively narrow in O. striata and O. involucellata, comparatively large in the remaining species) and in the size of the adaxial side groove (O. striata and O. involucellata have larger and deeper grooves than other species). Petiole anatomy in O. striata matches completely with Ligusticum gyirongense (Pan & al. 1992).

As a result, we here treat Oreocome as an endemic Sino-Himalayan genus, into which Selinium striatum (with the synonym Ligusticum gyirongense) and Ligusticum limprichtii must be transferred, in addition to the species having been in it initially. Three new species are to be described in Oreocome, based on collections from Pakistan and Nepal. The differences of Oreocome from related genera can be summarized as follows:
* from Cortia DC. and Cortiella C. Norman by ternately pinnate leaves with petiolulate basal primary segments, well developed stems and entire bracteoles;
* from Contioselinum Hoffm. by developed calyx teeth and vascular bundles situated at the bases of mericarp ribs;
Fig. 19-23. Transects of petioles – 19: Oreocome candollei, Pimenov & Kljuykov 12 (MW); 20: Oreocome striata, Pimenov & Kljuykov 33 (MW); 21: Oreocome involucellata, Pimenov & Kljuykov 39 (MW); 22: Oreocome limprichtii, Pimenov & Kljuykov 538 (MW); 23: Selinum wallichianum, Pimenov & Kljuykov 19 (MW). – Scale bar: 1 mm; 1 = collenchyme; 2 = lignified parenchyma; 3 = sclerenchyma cap of vascular bundle; 4 = xylem of vascular bundle; 5 = phloem of vascular bundle. cav = cavity.
* from *Selinum* L. by round or furrowed umbellum peduncles, developed calyx teeth and vascular bundles situated at the bases of the mericarp ribs;

* from *Ligusticopsis* Leute by narrow mericarp commissure and broadly winged (neither keeled nor filiform) dorsal mericarp ribs.

**Taxonomy**


Six species, distributed from SW China and Viet-Nam to Kashmir and Pakistan.

**Key to the species of Oreocome**

1. Bracts 4-10 .................................................. 2
   – Bracts lacking .............................................. 4
2. Umbels 8-16-rayed; mericarp ribs equal or almost equal, usually short-winged; fruits small, 2.9-4 mm long ...................... 1. *O. striata*
   – Umbels 20-45-rayed; marginal mericarp ribs winged, dorsal clearly narrower; fruits 4.5-8 mm long ...................... 3
3. Calyx teeth filiform, longer than stylopodia; styles up to 1.5 mm long; mesocarp cell walls without pits; stems thin, up to 6 mm in diam. .............. 2. *O. hindukushensis*
   – Calyx teeth lanceolate-triangular to lanceolate-linear, shorter than stylopodia; styles up to 0.7 mm long; mesocarp cell walls with pits; stems thick, 15-25 mm in diam. .............. 3. *O. candollei*
4. Bracteoles lanceolate, longer than umbellets; terminal leaf lobes linear-lanceolate to linear; stems, petioles and petiolules pubescent ...................... 4. *O. involucellata*
   – Bracteoles linear-lanceolate to linear, shorter than umbellets; terminal leaf lobes broader, toothed; stems pubescent only below umbels or glabrous .................................. 5
5. Umbels 20-45-rayed; marginal ribs 3-4 times larger than dorsal; secretory ducts in valleculas 1-2 .............. 5. *O. limprichtii*
   – Umbels 10-16-rayed; marginal and dorsal ribs almost equal; secretory ducts in valleculas 2-3 ...................... 3. *O. depauperata*

**The species of Oreocome**


≡ *Pimpinella bengalensis* H. Wolff in Feddes Repert. 17: 170. 1921. – Holotype: India, “Bengalia orientalis sine loco indic, Griffith 2615/1” (K!; isotypes: CAL, LE!)


**Distribution.** – China (Tibet: Xizang A.R.; SW China: Yunnan?), Viet-Nam, Thailand, Burma, Bhutan, Nepal, India (W Himalaya: Uttar Pradesh; N & NE India: Meghalaya, Assam).

**Note.** – In the Langtang Himal Mts we observed a clear ecological and altitudinal divergence between *Oreocome striata* (lower, mainly open situations) and *O. candollei*.

2. *Oreocome hindukushensis* Pimenov & Kljuykov, *sp. nova*

Holotype: Pakistan, E-Hindukush, Sai valley, 3100 m, *Picea smithiana*-forest, 1.9.1993, Schickhoff 2035 (GOET!). – Fig. 25.


*Distribution.* – Known only from the type locality.


*Distribution.* – Bhutan, Nepal, India (W Himalaya: Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh), Pakistan.
Fig. 25. Oreocome hindukushensis Pimenov & Kljuykov – holotype (GOET).
Note. – After examination of the protologues, the herbarium material and, especially, after field observations in Indian and Nepalese Himalaya we have to conclude that there are no reliable diagnostic characters to distinguish Oreocome candollei and O. elata and that both taxa are conspecific.


4. **Oreocome involucellata** Pimenov & Klju ykov, sp. nova
Holotype: Nepal, E Himalaya, Langtang National Park, basin of the Trisuli Khola, between Sing Gompa and Shulang Pati, 28°07’N, 85°20’E, 3400 m, 31.10.1999, Pimenov & Kljuykov 39 (MW!, isotype: KATH!). – Fig. 24.
Species nostra Oreocome candollei (Wall. ex DC.) Edgew. affinis, sed lobis terminalibus laminis foliorum linearibus vel lanceolato-linearibus et bracteolis prominentibus, ob lanceolatis, umbel lulis superantibus bene differt.

Planta perennis monocarpa, 80-100 cm alt., radicis palaribus, incrassatis, fusiformibus vel ramosis. **Collum** indivisum, residuis fibrosis petiolorum foliorum emortuorum dense tectum. **Caulis** pleurumque violaceus, leviter geniculatus, fistulosus, rotundus, in parte superiore sulcatus, pilis brevibus patentibus tectus, inferne sparsae, superne dense, corymbosus, ramis lateralis umbel lulis centralibus leviter superantibus. **Folia** radicalia longipetiolata, petiolis teretibus, bre viter pubescentibus, laminis 8-15 cm lg., 5-9 cm lt., ambitu triangularibus, 3-4-pinnatifidectis, segmentis basalis petiolulatis, petiolulis breviter pubescentibus, ad 10-12 mm lg., lobis terminalibus lanceolatis vel lanceolato-linearibus, 5-7 mm lg., 1.5-2 mm lt., fere glabribus. **Folia caulina** laminis simplificatis, vaginis longis angustis, superiora laminis sessilibus, 2-3-pinnatis. **Umbellae** ad 8-12 cm in diametro, involucris nullis vel bracteis solitariis, radii 25-32, valde inaequalibus, 2.5-4.5 cm lg., dense pubescentibus, costatis. **Umbellulae** bracteis ob lanceolatis, integribus vel breviter dentatis, nervis marginisque pubescentibus, apice augustes attenuatis, plem rumque umbellulis superantibus, radiolis 25-30, inaequalibus, 2-7 mm lg., breviter pubescentibus, costatis. **Dentes calycini** angusti, lanceolato-lineares, margine scabri, stylodiiis aequalibus vel duplo superantibus. Petala alba, ovata, basta cuneata, apice incurva et attenuata. **Fructus** ambitu oblongi, plerumque glabri, rarius aculeolis brevibus; **Mesocarpium** in jugis e cellulis aerenchymis, plus minusve amplis, membranis vix ligneoscentibus, fissuratim porosi compositum. **Endospermium** et spermoderma e cellulis minutis. Endospermium a facie commissurali fere planum.

Additional collections studied. – **NEPAL:** Bagmati Zone, Rasuwa District, between Syarapaon & Langtang, on dry open slopes, 3000 m, 20.9.1966, Nicolson 2552 (KATH, LE); Kyongchin Gomba, 28°13’-85°34’, 3600 m, grasslands, 8.9.1971, Dobremez 1037 (KATH); Langtang, 3400 m, 5.10.1977, Manandhar 498 (KATH).

Fig. 24. Oreocome involucellata Pimenov & Kljuykov – holotype (MW).


\textbf{Distribution.} – China (SW China: Sichuan, Guizhou, Yunnan).


6. \textit{Oreocome depauperata} Pimenov \& Kljuykov, \textit{sp. nova}

Holotype: Nepal, Daha Kharka (Humla distr.), 3500 m, smelly herb on open subalpine pasture, 18.8.1985, \textit{Shakya, Subedi \& Uprety} 8701 (KATH!). – Fig. 26.

Ab affini \textit{Oreocome invollucellata} lobis terminalibus laminis foliorum latioribus lanceolatis vel ovatis, caulibus glaberrimis, bracteolis angustioribus brevioribus (umbellulae brevioribusque) radiis subaequilongis, paucioribus (10-16 non 25-32) et radiolis paucioribus (12-19 non 25-30) differt.

\textit{Planta perennis} polycarpica (?), 40-50 cm alt., radicibus paltaribus, incrasatis, ramosis. \textit{Collum} ramosum, residuis fibrosis petiolorum foliorum emortuorum tectum. \textit{Caules} solitarii vel bini, rotundati, glabri, vix corymboso ramosi. \textit{Folia radicalia} numerosa, longipetiolata, laminis 5-8 cm lg., 2.5-3.5 cm lt., ambitu triangularibus vel rhomboideis, 2-3-pinnatisectis; segmentis basalibus petiolulatis, petiolulis 10-15 mm lg., lobis terminalibus lanceolatis, 5-7 mm lg., dentatis. \textit{Folia caulina} 2-3, laminis simplificatis, vaginis longis angustis. \textit{Umbellae} 2.5-3.5 cm in diam., involucris nullis vel rarius bracteis solitariis, radiis 14-16, subaequilongis, subglabis vel breviter pubescentibus. \textit{Umbellulae} bracteolis 8-12, lanceolatis vel linearis, apice anguste attenuatis, subglabris, radiolis brevioribus; radioli 12-19, 3.5-5.5 mm lg., subglabri. \textit{Dentes calycini} lanceo-lato-lineares. Petala alba, obovata, basi cuneata, apice incurva et attenuata. \textit{Fructus} immaturi ovales; \textit{stylopodia} breve-conica, \textit{styli} recurvi. \textit{Mericarpia} sectione transversali leviter dorso compressa; jugis anguste alatis, marginalibus vulgo leviter latioribus, exocarpium e cellulis minusve magnis, interruptum prope carpophorum. \textit{Vittae} valleculares 2-3, commissurales 4, jugales tenues, solitariae. \textit{Endospermium} a facie commissurali fere planum. Additional collections seen. – \textbf{NEPAL}: Wangang (Raouwa distr.), 1660 m, herb on open and rocky land, 17.10.1977, \textit{Manandhar} 421 (KATH).

\textbf{Distribution.} – Nepal (W).

\textbf{Taxonomic position of Selinum wallichianum}

\textit{Selinum wallichianum} cannot be referred to \textit{Oreocome} (see Results) and is even more distant from \textit{Selinum s.str.} The species is actucally similar to \textit{Ligusticopsis brachyloba} and therefore transferred to that genus here. Hence \textit{Ligusticopsis} is here for the first time reported for territores outside of China.

Our herbarium and field investigations moreover showed that \textit{Selinum wallichianum} as currently circumscribed is heterogenous, comprising two closely related species which are distributed in the S Himalaya. For the easterly species, the epithet “wallichiana” has priority, for the westerly species the epithet conifolia has to be used. The two species differ from each other as follows:
Fig. 26. Oreocome depauperata Pimenov & Kljuykov – holotype (KATH).
1. Leaves 2-3-pinnatisect; terminal leaf lobes 7-14 mm long, 3-7 mm broad, rhombic to ovate-lanceolate, at the margin with several teeth or lobed; stylopodia at the margin not waved, slightly thickened; mericarp marginal ribs slightly tumid at the ends.


**Distribution.** – China (Tibet: Xizang A.R.), Bhutan, Nepal, India (E Himalaya: Sikkim; N and NE India: West Bengal).

**Note.** – In the southern, rather wet slope of Annapurna we found both *Oreocome candollei* and *Ligusticopsis wallichiana* in very close or even the same localities in high-herbaceous subalpine stony meadows. In spite of essential differences particularly in fruit characters (see Results, above), moreover in stem and root structure, both species appear very similar. The characters of stem and root structure can hardly be observed in herbarium material.


**Distribution.** – India (W Himalaya: Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh), Pakistan.


**Acknowledgements**

This investigation was supported by grants from the Russian Foundation for Fundamental Investigations (RFII) and from the National Geographic Society (USA). We are grateful to the curators of following herbaria for the loan of specimens or the providing of study facilities to...
examine collections: B, DD, E, G, GOET, K, KATH, KUN, LE, MW, NAS, P and PE. The authors are thankful to Mark F. Watson for valuable comments.

References

Ledebour, C. 1829: Flora altaica 1. – Berolini.
—, — 1999: Južnaja granica areala roda Conioselinum (Umbelliferae) prohodit v Gimalajah. [Southern area border of Conioselinum (Umbelliferae) gets through the Himalaya]. – Bot. Żurn. 84: 87-92.

Address of the authors:
Prof. Dr Michael G. Pimenov, Dr Eugene V. Kljuykov, Dr Tatiana A. Ostroumova, Botanical Garden, Moscow State University, Moscow 119899, Russia; e-mail: pimenov@2.botgard.bio.msu.ru