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Research Article

Lectotypifications and taxonomic changes in the holoparasitic Orobanchaceae

Holger Uhlich[1], Stefan Rätzel[2], Óscar Sánchez Pedraja[3], Renata Piwowarczyk[4], Valerio Lazzeri[5] and Patrice Descombes[6]

[1]Welterod, Germany
[2]Frankfurt an der Oder, Germany
[3]Grupo Botánico Cantábrico, Liérganes (Cantabria), Spain
[4]Center for Research and Conservation of Biodiversity, Institute of Biology, Jan Kochanowski University, Kielce, Poland
[5]Research Institute on Terrestrial Ecosystems (IRET), CNR, Pisa, Italy
[6]Naturéum – State Museum of Natural Sciences, Department of Botany, Lausanne, Switzerland

Correspondence: Holger Uhlich (uhlich.holger@googlemail.com)

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Based on further extensive studies of specimens in various herbaria, lectotypes are designated for many taxa of holoparasitic Orobanchaceae. In particular, 47 names in the genera *Boschniakia* (incl. *Xylanche*), *Cistanche*, *Orobanche*, *Phelipanche* and *Phelypaea* are lectotypified. In total, type references are provided for 61 names and authentic material is cited for five names. All types are illustrated by scanned images. The following nomenclatural novelties are proposed as rank or state changes: *Orobanche amoena* var. *bella*, *Orobanche amoena* var. *colossea, Orobanche amoena* var. *ianthina, Orobanche colorata* subsp. *anatolica*, *Orobanche santolinae* subsp. *apuana*, *Orobanche santolinae* subsp. *cyrnea* and *Phelipanche pallens* f. *karatavica*. The following names are synonymized: *Anblatum tataricum*, *Boschniakia handelii*, *Boschniakia handelii* f. *minor*, *Boschniakia himalaica*, *Ceratocalyx macrolepis*, *Cistanche feddeana*, *Orobanche alsatica* var. *yuennanensis*, *Orobanche ammophila*, *Orobanche amoena* var. *calycina*, *Orobanche antirrhina*, *Orobanche australiana*, *Orobanche bicolor*, *Orobanche bovei*, *Orobanche carotae*, *Orobanche cernua* f. *tenuisepala*, *Orobanche coerulescens* var. *bicolor*, *Orobanche delilei*, *Orobanche gontscharovii*, *Orobanche ianthina*, *Orobanche indica*, *Orobanche insignis*, *Orobanche kotschyi* var. *multiplex*, *Orobanche latisquama*, *Orobanche major* f. *karelinii*, *Orobanche nicotianae*, *Orobanche ozanonis*, *Orobanche peisonis*, *Orobanche pogonanthera*, *Orobanche scabiosae*, *Orobanche spectabilis*, *Orobanche tatarica*, *Orobanche versicolor*, *Phelipanche atlantica*, *Phelypaea gigantea* and *Phelypaea melongenae*.

Keywords: *Anblatum*, *Boschniakia*, *Boulardia*, *Cistanche*, lectotypification, nomenclature, Orobanchaceae, *Orobanche*, *Phelipanche*, *Phelypaea*, systematics, taxonomy, *Xylanche*

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Introduction

Even before 2024, the first two authors began systematically assigning type specimens to the names of the holoparasitic Orobanchaceae, especially the genera *Cistanche*, *Orobanche*, *Phelipaea* and *Phelipanche*, insofar as this had not already been done by earlier authors. A first comprehensive publication on this topic appeared in this journal in March 2024 (Uhlich and Rätzel 2024).

The present article is a continuation of this work. For the sake of completeness, we also refer to earlier contributions on the typification of *Orobanche* names (Domina and Mazzola 2007, 2009, 2011, Carlón et al. 2008, Skočdopolová and Chrtek 2008, Domina and Štěpánek 2009, Domina et al. 2013, Piwowarczyk et al. 2019, 2023, Rätzel and Uhlich 2022).

As this research progressed, additional authors became involved, leading to a broader international collaboration.

Many names of holoparasitic Orobanchaceae are not yet, or not effectively, associated with type material, which complicates the assessment of their application. In addition, some types have to be critically reexamined to see whether they meet the current requirements of the International Code of Nomenclature (ICN; Turland et al. 2025, Art. 7 ff.). The importance of lectotypifications has already been discussed in Uhlich and Rätzel (2024).

Material and methods

In the past, the authors of the present contribution have conducted intensive studies in various herbaria (e.g. Berlin (B), Halle/Saale (HAL), St. Petersburg (LE) and Geneva (G)).

Furthermore, due to increasing online availability (St. Petersburg is an example with a rapid increase in scanned herbarium specimens), scans of many specimens have become possible to study in excellent quality (herbaria acronyms ordered alphabetically): AA (Alma-Ata), B (Berlin), BM (London), C (Copenhagen), CAL (Howrah), CAS (San Francisco), FI (Florence), G (Geneva), HAL (Halle/Saale), HIMC (Hohhot), IBSC (Guangdong), IRK (Irkutsk), JE (Jena), K (Kew), KFTA (St. Petersburg), L (Leiden), LE, LECB (both St. Petersburg), LY (Lyon), M (Munich), MEL (Melbourne), MPU (Montpellier), MW (Moscow), NY (New York), P (Paris), PAL (Palermo), PE (Beijing), PRC (Prague), S (Stockholm), TIE (Tianjin), U (Utrecht), W, WU (both Vienna), WAG (Wageningen) and WSY (Woking).

In addition to the material suitable for typification, we also considered authentic material to assess names that for various reasons were not validly published and to correctly keep or assign these names in the synonymy of validly published names.

The basic taxonomic concept mostly follows Uhlich and Rätzel (2024). However, because of diverging taxonomic opinions, the taxonomical treatments are attributed to particular authors of the present paper, as indicated in Table 1.

Nomenclatural checklist

Anblatum tataricum Fisch. (Fischer 1812, p. 19), nom. nud.

Species collected: [near the Lake Inder (Ozero Inder/Inder Koli/Inder See/Inderskoye Ozero, Atyrau Oblast, Kazakhstan)] probably by A.M.Tauscher (1806) and then published by the Russian botanist Friedrich Ernst Ludwig Fischer (1812), who would later become Director of the Botanical Garden in St. Petersburg.

Authentic material (cited here by **Sánchez-Pedraja & Piwowarczyk**), upon which the designation was based: – '*Anblatum tataricum* Fisch./ad lacum Inderiensem [Lake Inder, Atyrau Oblast, Kazakhstan] in deserto/Kirgisorum; habitat etiam versus/Bactrianam [Bactria, Balkh, N.E. Afghanistan] in eodem deserto/Fischer' (P02983461, the authentic specimen is the smaller specimen in the upper right corner, close to its label; Supporting information). – Further relevant material: – **A)** '*Phelipaea Salsa* Mey./ad lacum Inderiensem nec non [and also]/in deserto Kirgiso meridionalis/Claus [Ledebour 1849, p. 314]'. **B)** '*Anblatum tataricum* Fisch./ad lacum Inderiensem/legit *Tauscher* [or Tauscher et Hermann 1806?, see G00144850 and LE00052473]/bracteae inter 2 ...'. **C)** 'Alexandri Lehmann/Reliquiae botanicae/No./*Phelipaea salsa*/Al. Bunge'. **D)** 'Herb. Steven' (C.370641, the authentic material are the three specimens belonging to a single gathering on the lower part of the sheet close to their label).

As a complement to what was previously published by Uhlich and Rätzel (2024) in their typification of *Phelypaea salsa*, we want to here point out that the name treated above was published first by Fischer (1812, p. 19), but without a description or diagnosis or reference to a description or diagnosis, and therefore it is *nomen nudum* (Turland et al. 2025, Art. 38). Later, it was repeatedly mentioned by other authors (Ledebour 1830, p. 462, Don 1837–1838, p. 633; Reuter 1847, p. 12; Ledebour 1849, p. 314; Beck 1930, p. 36) but always it was merely cited in synonymy (Turland et al. 2025, Art. 36.1).

The Databases such as the International Plant Names Index (IPNI 2024) and Plants of the World Online (POWO 2024) give its place and date of publication without any commentary. Besides, this name is also misspelt there as '*tartaricum*' but the correct specific epithet is '*tataricum*' since it refers to Tataria/Tatary (Stearn 1992, p. 223).

Boschniakia handelii Beck (Beck 1930, p. 328)

Described by Beck (1930) as a new species from mountains of Southwestern China on the material collected by the Austrian botanist Handel-Mazzetti in his Iter sinense 1914–18 ['China. – Im nordwestlichen Teile der Provin Yünnan: bei der Stadt Lidjiang (Likiang [Lijiang]), vornehmlich auf dem Berge Yülung-schan [Yulong Xue Shan/Jade Dragon Snow Mountain, Yulong County] (Handel-Mazzetti, Iter sinense 1914/18, n. 4148! fruct.), bei dem Dorfe Yungning [Yongning] in gemischten Eichenwäldern ober dem Dorfe

Table 1. Overview of lectotypified or discussed plant names in Orobanchaceae.

Accepted name	Lectotypified or discussed name	Responsible authors	Figure no.	Suppl. Fig. no.
Boulardia latisquama F.W.Schultz	*Orobanche latisquama* f. *ochroleuca* Maire	OS, RP		28
Boulardia latisquama F.W.Schultz	*Ceratocalyx macrolepis* Coss.	OS, RP		5
Cistanche laxiflora Aitch. & Hemsley	*Cistanche laxiflora* Aitch. & Hemsley	HU, SR		7
Cistanche ridgewayana Aitch. & Hemsley	*Cistanche ridgewayana* Aitch. & Hemsley	HU, SR		8
Cistanche sinensis Beck	*Cistanche sinensis* Beck	OS, RP	1	
Cistanche tinctoria (Forssk.) Deflers	*Orobanche insignis* E.D.Clarke	OS, RP		24
Cistanche tubulosa (Schenk) Wight ex Hook.f.	*Phelypaea gigantea* Kar.	HU, SR	15	
Orobanche alba subsp. *alba*	*Orobanche alsatica* var. *yuennanensis* Beck	HU, SR	2, 3	
Orobanche amoena C.A.Mey.	*Orobanche amoena* C.A.Mey.	HU, SR	4	
Orobanche amoena C.A.Mey.	*Orobanche amoena* var. *calycina* Reut.	OS, RP		11
Orobanche amoena C.A.Mey.	*Orobanche coerulescens* var. *bicolor* O.Kuntze	OS, RP		18
Orobanche amoena var. *bella* (Beck) O.Fedtsch. & B.Fedtsch.	*Orobanche amoena* f. *bella* Beck	HU, SR		10
Orobanche amoena var. *colossea* (Beck) Ó.Sánchez & Piwow.	*Orobanche amoena* f. *colossea* Beck	OS, RP	5	
Orobanche amoena var. *ianthina* (Franch.) Ó.Sánchez & Piwow.	*Orobanche ianthina* Franch.	OS, RP		22
Orobanche camptolepis Boiss. & Reut.	*Orobanche gontscharovii* Novopokr. & Nepli	HU, SR		20
Orobanche centaurina Bertol.	*Orobanche major* f. *karelinii* Beck	HU, SR		30
Orobanche cernua L.	*Orobanche indica* Wall.	HU, SR		23
Orobanche cernua var. *australiana* (F.Muell.) Beck	*Orobanche australiana* F.Muell.	HU, SR		13
Orobanche cernua var. *cumana* (Wallr.) Beck	*Orobanche bicolor* C.A.Mey.	HU, SR		14
Orobanche cernua var. *desertorum* Beck	*Orobanche nicotianae* Wight	HU, SR		31
Orobanche cernua var. *desertorum* Beck	*Orobanche pogonanthera* Reut.	HU, SR		35
Orobanche coerulescens Stephan emend. Willd.	*Cistanche feddeana* K.S.Hao	OS, RP		6
Orobanche coerulescens Stephan emend. Willd.	*Orobanche ammophila* C.A.Mey.	HU, SR		9
Orobanche colorata subsp. *anatolica* (Boiss. & Reut.) Ó.Sánchez & Piwow.	*Orobanche leucopogon* Boiss. & Hausskn.	HU, SR		29
Orobanche grisebachii Reut.	*Orobanche grisebachii* Reut.	HU, SR		21
Orobanche haenseleri Reut.	*Orobanche haenseleri* Reut.	OS, RP, HU, SR	6	
Orobanche hansii A.Kern.	*Orobanche cernua* f. *tenuisepala* Beck	HU, SR		17
Orobanche hansii A.Kern.	*Orobanche hansii* A.Kern.	HU, SR	7	
Orobanche kashmirica Clarke ex Hook.f.	*Orobanche kashmirica* Clarke ex Hook.f.	OS, RP		26
Orobanche kotschyi Reut.	*Orobanche kotschyi* Reut.	OS, RP	8	
Orobanche kotschyi var. *multiplex* Beck	*Orobanche kotschyi* var. *multiplex* Beck	OS, RP		27
Orobanche kotschyi var. *spectabilis* (Reut.) Beck	*Orobanche spectabilis* Reut.	HU, SR	13	
Orobanche minor Sm. (s.l.)	*Orobanche bovei* Reut.	HU, SR		15
Orobanche pancicii Beck	*Orobanche pancicii* Beck	P. Mráz, HU, SR,	9	
Orobanche pancicii f. *kerochroa* Beck	*Orobanche pancicii* f. *kerochroa* Beck	P. Mráz, HU, SR,		33
Orobanche picridis F.W.Schultz	*Orobanche carotae* Des Moul.	HU, SR		16
Orobanche pubescens D'Urv.	*Orobanche pubescens* D'Urv.	HU, SR	10	
Orobanche pubescens D'Urv.	*Orobanche versicolor* F.W.Schultz	HU, SR		38
Orobanche reticulata var. *pallidiflora* (Wimm. & Grab.) Beck	*Orobanche antirrhina* Reut.	HU, SR		12
Orobanche reticulata var. *reticulata*	*Orobanche scabiosae* W.D.J.Koch	A. Fleischmann, HU, SR		36

(*continued*)

Table 1. (Continued).

Accepted name	Lectotypified or discussed name	Responsible authors	Figure no.	Suppl. Fig. no.
Orobanche serbica Beck & Petrovic	*Orobanche ozanonis* F.W.Schultz ex Beck	HU, SR		32
Orobanche serbica Beck & Petrovic	*Orobanche serbica* Beck & Petrovic	VL, P. Mráz, PD	11	
Orobanche solmsii C.B.Clarke	*Orobanche solmsii* C.B.Clarke	HU, SR	12	
Orobanche stocksii Boiss.	*Orobanche stocksii* Boiss.	HU, SR	14	
Phelipanche aegyptiaca (Pers.) Pomel	*Orobanche delilei* Decne.	HU, SR		19
Phelipanche aegyptiaca (Pers.) Pomel	*Phelypaea melongenae* F.W.Noë ex Beck	HU, SR		40
Phelipanche caesia (Rchb.) Soják	*Anblatum tataricum* Fisch.	OS, RP		1
Phelipanche caesia (Rchb.) Soják	*Orobanche peisonis* Beck	OS, RP		34
Phelipanche caesia (Rchb.) Soják	*Orobanche tatarica* Link ex Beck	OS, RP		37
Phelipanche pallens f. *karatavica* (Pavlov) Ó.Sánchez & Piwow.	*Orobanche karatavica* Pavlov	OS, RP		25
Phelipanche purpurea subsp. *ballii* (Maire) Carlón, G.Gómez, M.Laínz, Moreno Mor., Ó.Sánchez & Schneew.	*Phelipanche atlantica* Pomel	OS, RP		39
Xylanche himalaica (Hook.f. & Thomson) Beck	*Boschniakia handelii* Beck	UH, SR, RP, OS		2
Xylanche himalaica (Hook.f. & Thomson) Beck	*Boschniakia handelii* f. *minor* Beck	HU, SR		3
Xylanche himalaica (Hook.f. & Thomson) Beck	*Boschniakia himalaica* Hook.f. & Thomson	HU, SR		4
Additional figures:				
Orobanche colorata subsp. *anatolica* (Boiss. & Reut.) Ó.Sánchez & Piwow.	*Orobanche anatolica* Boiss. & Reut.	OS, RP	16, 17	–
	Phelypaea flava C.A.Mey. (Lectotype)	HU, SR		41
	Orobanche artemisiae-campestris Vaucher ex Gaudin (Lectotype sheet 2)	HU, SR		42
	Orobanche oxyloba f. *septemloba* Beck (Lectotype)	HU, SR		43
	Phelypaea bayernii Novopokr. (Authentic specimen)	HU, SR		44

Dschadse [Zhazi] bei 3000 m Seehöhe im Juli 1915 (Handel-Mazzetti n. 7059 fruct.); zwischen den Flüssen Lu-djang (Salween) und Dijou-djang (Irrawadi [Irrawaddy River/Ayeyarwady] orient, super.) bei 27° 58′ in der kalt, temper. Region der Tannen und Rhododendren bei 3650 m Seehöhe unter dem See Tsukue im Juli (Handel-Mazzetti n. 9531!); auf dem Joche Ulüla am Westabhange zwischen Rhododendrum [sic] bei 4000–4085 m Seehöhe (Handel-Mazzetti n. 9285!)'].

Lectotype (Uhlich, Rätzel, Piwowarczyk and Sánchez-Pedraja, designated here): – **A)** 'Handel-Mazzetti, Iter sinense 1914–18,/sumptibus Academiae scientiarum Vindobonensis susceptum./Nr. 4148./*Boschniakia Handelii* G. Beck, sp. n./det. Beck [manu Beck]/Prov. Yünnan bor.-occid.: Prope urbem Lidjiang (Likiang), impri-/mis in monte Yülung-schan. (De stationibus exactis confer publica-/tiones Forrestiananas in Not. Bot. Gard. Edinburgh, 1911 et seq.)./Leg. VI.–IX. 1914, 1915, 1916 collectores indigeni/(Diar. Nr. 661, 1182 1206, 1681, 1901)'. **B)** '*Boschniakia* (*Thamnophagus*)/Handel-Mazzetti n. sp./Dr. G. de Beck'. **C)** '… Wien/*B. himalaica* Hook. f. & Thomson/Acq.–J.Nr. 2730'. **E)** 'Syntypus for *Boschniakia handelii* Beck/…/*Xylanche himalaica* (Hook. f. & Thomson) Beck/… H. Rainer (W/WU) 2019-10-07/…' (WU0107076 [Handel-Mazzetti, Iter sinense 1914–18, n. 4148, Supporting information], the lectotype is composed by four plants and some fragments of a single species and gathering). – Isolectotypes [n. 4148]: – Idem (W0088650, P02968829 and W1928–0001071). – Syntypes [n. 7059 and 9531]: – **A)** 'Handel-Mazzetti, Iter sinense 1914–18,/sumptibus Academiae scientiarum Vindobonensis susceptum./Nr. 7059./(= *Boschniakia handelii* G. Beck sp. n.)/det. Beck/Prov. Yünnan bor.-occid.: Prope pagum Yungning, in regionis temperatae quercetis mixtis supra vic. Dschadse./dubstr. Arenaceo, alt. s. m. ca 3000 m. ... Diar. Nr. 1268/Leg. 16-VII-1915 …'. **B)** '*Boschniakia* (*Thamnophagus*)/Handel-Mazzetti n. sp./Dr. G. de Beck'. **C)** '… Wien/*B. himalaica* Hook.f. & Thomson/Acq.–J.–Nr. 2730'. **D)** 'Syntypus for *Boschniakia handelii* Beck/…/*Xylanche himalaica* (Hook.f. & Thomson) Beck/… H. Rainer (W/WU) 2019-10-07/…' (WU0107075, the sheet contains two plants of a single species and gathering). – **A)** 'Handel-Mazzetti, Iter sinense 1914–18,/sumptibus Academiae scientiarum Vindobonensis susceptum./Nr. 9531./(*Boschniakia handelii* G. Beck, sp. n.)/det. Beck/Prov. Yünnan bor.–occid.: Prope fines Tibeto-Birmanicas inter fluvios Lu-djiang (Salween) et Djiou-djiang (Irrawadi orient. super.) 27°58', in regionis frigide temperatae abieto rhododendretis infra lacu Tsukue. alt. s. m. ca 3650 m./Leg. 11-VII-1916/(Diar. Nr. 1783)'. **B)** '*Boschniakia* (*Thamnophagus*)/Handel-Mazzetti /n. sp./Dr. G. de Beck'. **C)** '… Wien/*B. himalaica* Hook.f. & Thomson/

Acq.–J.Nr. 2730'. **D)** 'Syntypus for *Boschniakia handelii* Beck/…/*Xylanche himalaica* (Hook. f. & Thomson) Beck/… H. Rainer (W/WU) 2019-10-07/…' (WU0107074, the sheet contains three plants of a single species and gathering).

The species was placed by Beck in the genus *Boschniakia* and the monotypic *B.* sect. *Thamnophagus* Beck (1930). Beck thought he was describing a new species different from those he had placed in the genus *Xylanche* (Beck 1890, p. 58; Beck 1930, p. 330).

Nowadays the prevailing opinion is that this species belongs in *Boschniakia* and the two species placed in *Xylanche* [*X. himalaica* (Hook.f. & Thomson) Beck and *X. kawakamii* (Hayata) Beck] are synonymous (Yu 2013). In this context, the name *Xylanche himalaica* (the type of the genus *Xylanche*) has priority. However, the taxonomic position of this latter species seems to be a subject of scientific debate between those who accept a separate genus *Xylanche* [*X. himalaica* (Hook.f. & Thomson) Beck; e.g. Beck, l.c.] and those who include the genus *Xylanche* in the genus *Boschniakia* (as *B. himalaica* Hook.f. & Thomson; e.g. Piwowarczyk 2015, p. 156 ff.).

The name is a synonym of *Xylanche himalaica* (Hook. f. & Thomson) Beck (1890, p. 58).

Boschniakia handelii f. *minor* Beck (Beck 1930, p. 329)

Described from: [NW Yunnan ('cum n. 9265 [lapsu, n. 9285] supra citato')].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Handel-Mazzetti, Iter Sinense 1914–1918,/sumptibus Academiae scientiarum Vindobonensis susceptum./Nr. 9285./*Boschniakia handelii* G. Beck, sp. n./f. *minor* G. Beck/ Not. ad pl. viv.: det Beck/Prov. Yünnan bor.-occid.: Prope fines Tibeto-Birmanicas inter fluvios Lu-djiang (Salween) et Djiou-Djiang (Irrawadi or. sup.), in jugi Ulüla,/27°52', lateris occident. regione alpina, inter Rhododendra./Substr. micoschistaceo; alt. s. m. ca 4000–4085 m./Leg. 4. VII. 1916 Dr. Heinr. Frh. v. Handel-Mazzetti (Diar. Nr. 1761)'. **B)** '*Boschniakia*/(Thamnoph[a]gus)/*Handelmazzettii*/n. sp./Dr. G. de Beck' [manu Beck]. **C)** 'Botanisches Institut der Universität Wien./*B*[*oschniakia*]. Hook.f. et Thoms./ Acq.-J.-Nr. 2730'. **D)** 'Syntypus WU 0107073/*Boschniakia handelii* Beck/forma *minor* Beck/Pflanzenr. (Engler) IV 261 (Heft 96): 329 (1930)/= *Xylanche himalaica* (Hook.f. & Thomson) Beck/typificavit D. Reich (WU) 2019-12-07/Handel-Mazzetti, H. R. E. von Handel-Mazzetti, Iter sinense/(1914–1918) 9285' (WU0107073, Supporting information). – Isolectotype: (WU 0088651).

The name is a synonym of *Xylanche himalaica* (Hook.f. & Thomson) Beck in Biblioth. Bot. 19: 58 (1890).

Boschniakia himalaica Hook.f. & Thomson (Hooker 1884, p. 327)

Described from: [the Indian states of Uttarakhand and Sikkim ('Temperate and subalpine Himalaya, on *Rhododendron* roots; Garwhal [sic, correct Garhwal] and Kumaon, alt. 8000–10 000 ft., Strach[ey]. & Winterb[ottom].; Sikkim, alt. 10–13,000 ft., J. D. H[ooker]. [C. B.] Clarke')].

Lectotype (**Uhlich and Rätzel, designated here**): – 'Himalayan Herbarium./R. Strachey and J. E. Winterbottom./No. 2/*Orobanche*/*Boschniakia himalaica* Hf. & T./Dwali 8300 [ft.] Kumaon/Habitat. Rumni [?] Garhwál/ Elevation above the Sea 10 000 Feet.' (K000938933, the four left plants; Supporting information). – Isolectotype: (GH00914298). – Other syntypes: – 'Herb. Ind. Or. Hook. fil. & Thomson/*Boschniakia himalaica* Hf. & T./Hab. Sikkim. Regio. temp./Alt. 10–12,000 ped. Coll. J. D. H[ooker].' (K000938933, the both right plants, K000938934, GH00914299, M0185512, W007961, W0031524, E00273644). – 'Orobanchad [sic] on *Rhododendron* roots/*Boschniakia himalaica* Hook. et Th./Jongri 13000 [ft.] Sikkim/25743 15 Oct 1875/Coll. CBClarke Comm[unicavit] 10/[18]77' (K01392680). – 'Orobanchad [sic] Coll. C. B. Clarke/A 'genus' of Hooker & Thomson/Grows on roots of *Rhododendron* (? Thomson)/*Boschniakia himalaica* H.f. & Th./Jongri 13000 [ft.] Sikkim/25812 15 Oct 1875' (K01392681).

Boschniakia himalaica Hook.f. & Thomson is a basionym of the currently accepted name *Xylanche himalaica* (Hook.f. & Thomson) Beck.

Ceratocalyx macrolepis Coss. (Cosson 1848, p. 146), nom. superfl.

This species was described by the French botanist Ernesto Cosson based on the material collected by E. Bourgeau: [in Tibidabo Mountain (Catalonia, Spain)] and by M. C. Durieu de Maisonneuve: [in Mostaganem (Algeria)].

Lectotype (designated by Domina and Soldano 2015, p. 169): – **A)** 'n.º 14. Notes prises sur la plante vivante./.../ Cette belle espèce a plutôt l'aspect d'un *Phelipaea* que d'une *Orobanche* ...' ['Notes prises sur la plante vivante par M. Durieu' (Schultz 1847–1848, p. 104)]. **B)** 'n.º 14/*Boulardia latisquama* F. Schultz/Sur le *Micromeria inodora* Benth., et/ plus rarement sur le *Rosmarinus officinal*/*lis*, L. Jamais sur d'autres plantes./Mostaganem [Algeria]. Coteaux maritimes/20 avril 1844' (P02977809, Supporting information). – Isolectotypes: – P02977809 and P06775839 (Domina & Soldano 2015, p. 168).

This name has frequently been used for a species whose correct name is *Boulardia latisquama*. It became familiar to botanists mainly through the exsiccata distributed by Cosson ['in Bourgeau Exsicc. Pyr. Espagn. nº 741 (octobr. 1847)']: – **A)** '*Orobanche macrolepis*, Coss. et Germ./du *Rosmarinus officinalis*. Nº 1/Montagne de Tibidavo [Tibidabo, Barcelona]/ Avril 1847'. **B)** 'E. Bourgeau, Pyrénées Espagnoles. N 741./*Ceratocalyx macrolepis* (*Orobanche macrolepis*, Coss. et Germ.)/Parasite sur les racines du *Rosmarinus officinalis*./ Montagne de Tibidavo près de Gracia, Avril 1847'. **C)** 'Herb. E. Cosson, 1848./*Ceratocalyx macrolepis*,/Coss. in ann. sc. nat./*Boulardia latisquama*, Schultz' (P04384977-hb. Cosson; K000759341-hb. J. Gay; G00383384).

Later Cosson formally described and published the species in (1848 [Mar 1848]) only a short time after Schultz published his *Boulardia latisquama* F.W.Schultz (Dec 1847–Mar 1848 [Dec 1847 according to Cosson]). Cosson included

Schultz's name in the synonymy of his *C. macrolepis* since he considered Schultz' taxon poorly described. However, Schultz' name was validly published and therefore takes priority. Since Cosson included the correct name published by Schultz in his synonymy, the type of *Boulardia latisquama* F.W.Schultz is also the lectotype of *Ceratocalyx macrolepis* (Turland et al. 2025, Art. 7).

***Cistanche feddeana* K.S.Hao (Hao 1934, p. 222)**

Described from southwestern China ['China: Prov. Szechuan (Sichuan), in den Wäldern, bei der Stadt Chaohua Hsien, um 450 m ü. M., mit Früchten und Blüten, gesammelt von K.S. Hao no. 282, 25.V.1930'].

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here): – **A)** 'Flora of China/Field No. 282 Date 25.V.1930/Locality Chao Hua Hsien, Szechuan [Sichuan]/ Altitude 450 m/…/Collector K.S. Hao. **B)** '*Cistanche feddeana* Hao/det. K.S. Hao 1934'. **C)** 'Typus'. **D)** '*Orobanche cumana* Wallr./Zhi Y. Zhang/83.6.16' (PE00032936, two plants on the right; Supporting information).

The sheet contains five plants, the three on the left side seem to correspond to *O. cernua* aggr. (incl. *O. cumana* Wallr. (1825); Supporting information). The other two, on the right side of the sheet, are the lectotype and belong to a different species [*O. coerulescens* Stephan emend. Willd. (1800)].

This lectotype is selected because it strictly adheres to the original diagnosis; Hao characterized *C. feddeana* as a 'tomentoso-lanata' plant. Among the specimens on the sheet, this morphological trait is only present in *O. coerulescens*, whereas *O. cernua* is entirely glabrous.

Cistanche feddeana has frequently been misunderstood/ confused with *C. sinensis* (Grubov 1982, p. 228, Urgamal et al. 2014, p. 193, Batlai et al. 2017, p. 577, 581, Ataei 2017, p. 128). After seeing the type of this species, in our opinion, the concept and distribution reflected in POWO is, as shown by our synonymy and our typification of *C. sinensis* (below).

The name *Cistanche feddeana* is a synonym of *Orobanche coerulescens* Stephan emend. Willd.

***Cistanche laxiflora* Aitch. & Hemsley (Aitchison 1888, p. 94, t. 40)**

Described from Afghanistan ['Hari-rud valley: 1093 (in part). April and May 1885'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Delimitation Commission./1093 Afghanistan, 1884–85./ in part/J. E. T. Aitchison,/Brigade-Surgeon, I. M. S.' **B)** '*Cistanche*/*laxiflora* Aitch./et Hemsl./Afghanistan, 1884–5/ Aitchison/1093. in part'. (K000449427, both plants; Supporting information). – Isolectotype: (CAL0000021108).

The specimen consists of two plants. In the literature it has sometimes been stated (see, for example, Ataei 2017, p. 106) that the plant on the right side of this herbarium sheet is the type specimen of *C. ridgewayana*. This is not the case. Contrary to the label attached to the specimen, this is not a mixed collection; both plants belong to *C. laxiflora*.

Cistanche laxiflora Aitch. & Hemsley is a currently accepted name.

***Cistanche ridgewayana* Aitch. & Hemsley (Aitchison 1888, p. 93 f., t. 39)**

Described from Afghanistan ['Hari-rud valley: 1093 (in part). This species [*Cistanche laxiflora*] … was mixed with *C. Ridgewayana* and distributed with it under the same number'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Delimitation Commission./1093 Afghanistan, 1884–85./ in part/J. E. T. Aitchison,/Brigade-Surgeon, I. M. S.' **B)** '*Cistanche*/*laxiflora* Aitch. / et Hemsl./Afghanistan, 1884–5/ Aitchison/1093. in part' (CAL000019104, Supporting information).

Although the herbarium specimens in Kew (K) and Calcutta (CAL) are labelled with an excerpt from the protologue and explanations of the mixed collection number 1093 of *C. laxiflora* and *C. ridgewayana*, the herbarium specimen in Kew, in our opinion, only contains *C. laxiflora* (see above).

Cistanche ridgewayana Aitch. & Hemsley is a currently accepted name.

***Cistanche sinensis* Beck (Beck 1930, p. 38)**

Described on material collected in north China by the Révérend Père Licent ['Nord-China: Kansu (Gansu) septentrional, bei Wei tschou (Weizhou/Wei Prefecture), am 7. Juni 1918 (R.P. Licent n. 3845, in Herb. mus. Paris)'].

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here): – **A)** '3845/Kansou septentrional/Wei tcheou/7-VI-1918 [leg. *R.P. Licent*]'. **B)** 'Herb. Mus. Paris/*Cistanche sinensis* n. sp./20.XII.1928 Beck [manu Beck]/R.P. Licent. – Chine Septentrionale./Reçu le 24 Août 1922'. (P02983456, lectotype consist of two plants belonging to a single gathering (Turland et al. 2025: Art. 8); Fig. 1). – Isolectotypes: – **A)** 'Herbarium Kewense/Northern China/Nº 3845/cis/*Cystanche* sp./Wei tschou/Kansou Septene/7.6.18/Coll. Abbe E. Licent Purchased 1922'. **B)** '*Cistanche salsa* (C.A. Mey.) G. Beck/ Det. N. Ataei 2012.02.03'. **C)** 'isotype/of *Cistanche sinensis* Beck/in Engl., Pflanzenr. IV: 261 (Heft 96): 38 (1930)'. **D)** 'Molecular (DNA), Organ: Leaf, flower, DNA Bank number: 42129, Taken by: Crawford, Dept.: Herbarium, Date: 19.4.2012' (K000852791, three plants belonging to a single gathering). – **A)** '14.../Scrofularinees/*Lathraea*'. **B)** 'Herbier 3845/*Orobanche*/*Lathraea*/…/Date 7.VI.[19]18/… Parasite sur 3836' (TIE00030528, the specimen is formed four plants belonging to a single gathering).

After seeing abundant material, we conclude that *C. lanzhouensis* Zhi Y.Zhang (1984), described from Gansu, too, and *C. ningxiaensis* D.Z.Ma & J.A.Duan (1993), described from Ningxia (close to and formerly part of Gansu) and considered by Ataei (2017, p. 117) to be synonyms of *C. fissa* (C.A.Mey.) Beck, are mere synonyms for this species. The morphological characters indicated to differentiate them, like the colour of the lobes when dry, are not consistent (see, e.g. HIMC0034646), and a posterior fifth tooth is a frequent 'anomaly' in the gamosepalous species of this family. We believe that for these taxa we do not need to establish any new infrageneric names under *C. sinensis*.

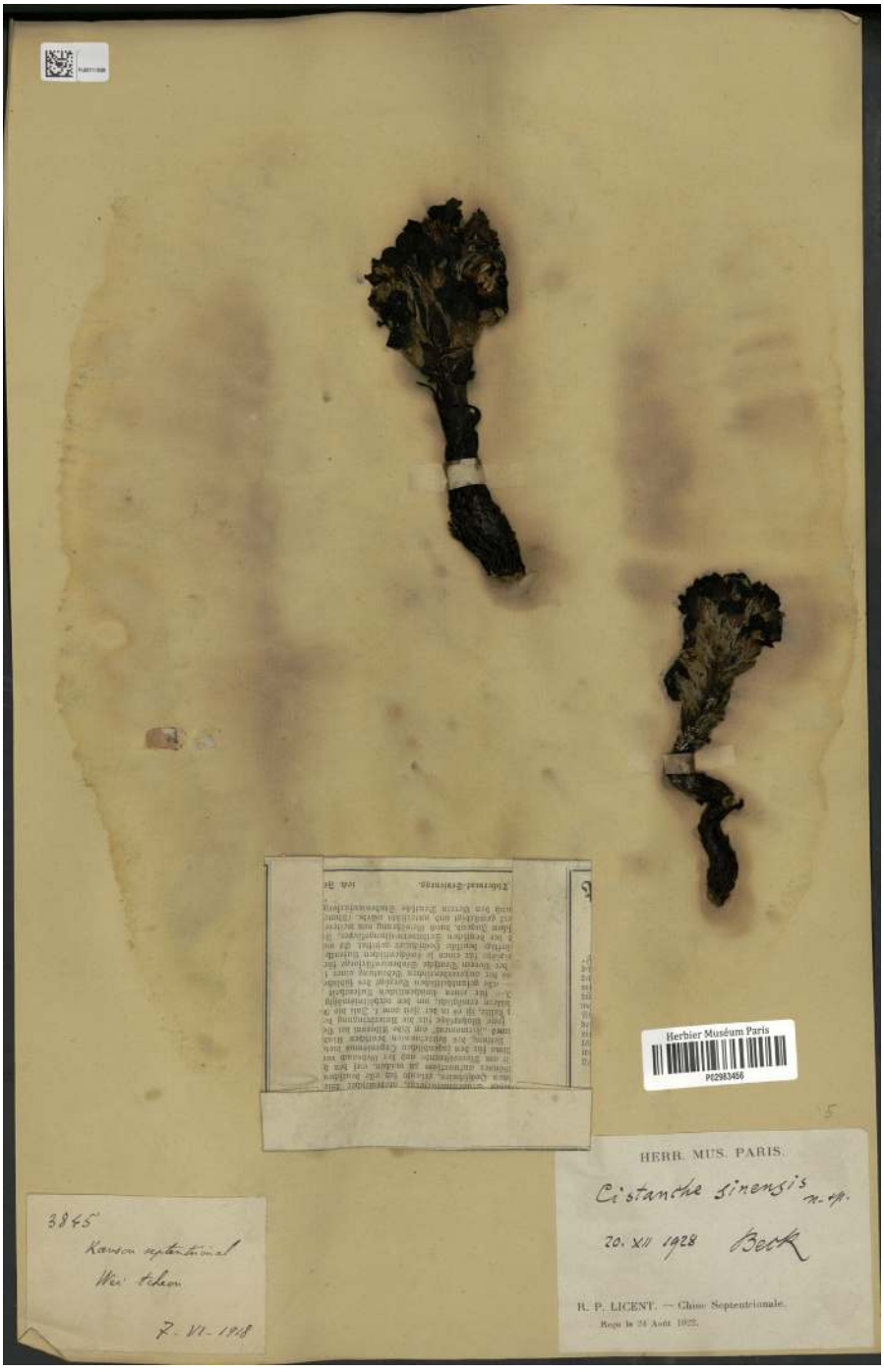


Figure 1. Lectotype of *Cistanche sinensis* Beck (P02983456, designated here). Courtesy of Muséum national d'Histoire naturelle Paris.

Cistanche feddeana K.S.Hao (1934), mentioned above, is another species that was treated as a synonym of *C. sinensis* by some botanists, but as our typification indicates that the former is completely different and belongs to *O. coerulescens* Stephan emend. Willd. (1800).

The species is distributed in arid habitats through northern China and southern Mongolia and has been frequently confused with other *Cistanche* species (Sánchez Pedraja et al. 2016). In our opinion, the best images of this species are in PPBC (Plant Photo Bank of China; https://ppbc.iplant.cn/tu/14204255) and iNaturalist (sometimes under other names; https://www.inaturalist.org/observations/50376110).

Cistanche sinensis Beck is a currently accepted name.

***Orobanche alsatica* var. *yuennanensis* Beck (Beck 1930, p. 259)**

Described from China ['China: Yünnan, um die Stadt Lidjiang (Likiang) bei 2950–3100 m Seehöhe in lichten

Nadel- und Mischwäldern gegen den Bach Beschni, im Juli (Handel-Mazzetti, Iter sinense 1914–1918, n. 4188!, 7010!), dann bei Ngulukö (n. 4308!) in trockenen Wiesen, angeblich auf Labiaten (*Origanum*?), bei Yungning gegen den Berg Waha bei 2900 m, im Juli (n. 7077!) ; um Dali (Talifu) bei 2800 m zwischen Hsinfsun und Hsia-kuan im westl. Yünnan im Juli (R. Mell!); bei Sankia in 2600 m (E. Maire! comm. Handel-Mazzetti)'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Handel-Mazzetti, Iter Sinense 1914–1918/sumptibus Academiae scientiarum Vindobonensis susceptum./Nr. 4188./*Orobanche alsatica* Kirschl./var. n[ova] *yünnanensis* G. Beck/det. Beck/Not. ad pl. viv. fl. pallde brunnei intus flavi/stigma pallide brunnescens/Prov. Yünnan bor.-occid.: Prope urbem Lidjiang („Likiang') in regi-/onis temperatae pratis siccis et pinetis silvisque mixtis apertis versus/rivum Beschui./Substr. calceo … alt. s.m. ca 2950–3100 m./Leg. 18. VII. 1914 Dr. Heinr. Frh. v. Handel-Mazzetti (Diar. Nr. 662).' **B)** '*Orob. alsatica* Kirschl./(v[ar]. *libanotidis*) v[ar]. *yünnanensis*/Beck' [manu Beck]. **C)** 'Botanisches Institut der Universität Wien./*O. yuennanensis* (Beck) H.-M./Acq.-J.-Nr. 2730'. **D)** 'Herbarium WU/*O. alba* Willd./2005/7 conf./det./rev. A. Pujadas'. **E)** 'Syntypus WU 0065124/*Orobanche alsatica* Kirschl./var. *yunnanensis* Beck/Pflanzenr. (Engler) IV 261 (Heft 96): 259 (1930)/= *Orobanche yunnanensis* (Beck) Hand.-Mazz./typificavit M. Lachmayer (WU) 2012-05-10/Handel-Mazzetti, H. R. E. von Handel-Mazzetti, Iter sinense/(1914–1918) 4188'. (WU0065124, Fig. 2). – Other syntypes: – '… prope urbem Lidjiang, … 09. VII. 1915, *Handel-Mazzetti 7010*' (W19280001076, WU0065123). – '… prope pagum Yungning, … 19. VII. 1915, *Handel-Mazzetti 7077*' (W19280001079, WU0065121). – '… sous bois de pins à San-Kia, … [s. d.], *E. E. M[aire] [s.n.]*' (W19280016962, WSY0076009, IBSC0547828). – '… prope vicum Ngu-lukö, 22. VII. 1914, *Handel-Mazzetti 4308*' (WU65122).

As already stated by A. Pujadas in 2005 (in sched.), this name is a synonym of *Orobanche alba* var. *alba*. *Handel-Mazzetti 7077* noted on the cover of the specimen 'in Origano?' and on the cover of the specimen *Handel-Mazzetti 4308* 'in Labiatis?'. Living plants from the area of the type locality (Fig. 3) also show typical characteristics of *Orobanche alba*, although the lobes of the upper lip of the crown are mostly protruding and the undivided calyx segments are relatively broad and blunt. Whether these plants represent an infraspecifically definable taxon remains to be determined by further investigations (especially on fresh material).

The Handel-Mazzetti collection *4188* (WU00065124) was selected as lectotype due to the typical development and good condition of the material.

This plant is found not only in China ('Likiang', *J. F. Rock 4836* US03927130, *C. Schneider 3414* US03927131), but also in Nepal (e. g. E00077670, E00075237, E00099640, E00209632 to E00209635, E00888612, E00888643, E00888649, E00607531, E00607533 and E00607747), Pakistan [e. g. Prov. de la frontiere NE Vallée du Jalkad Nar, *F. Schmid 523* (G s.n.)] and India [e. g. 'Himachal Pradesh', *W. N. Koelz 968* MICH1535050, 'Kumaoun, Uttarakhand', *J. F. Duthie 5869* (G s.n.); 'Punjab', *R. R. Stewart 19652* NY05144852, 'Srinagar', *R. R. Stewart 4108* NY05144851].

Pending better information, the name is currently considered synonymous with *Orobanche alba* subsp. *alba*.

Orobanche ammophila C.A.Mey. (Ledebour 1830, p. 454 f.)

Described from Kazakhstan and Russia (Altai) ['Hab. in locis arenosis ad fl. Irtysch et Bekun in parte orientale deserti soongoro-kirghisici minime rara (M[eyer].), circa metallifodinam Loktewsk'].

Lectotype (**Uhlich and Rätzel, designated here**): – '[*Orobanche*] *ammophila* C.A.Mey./Loktjew/Herb. Fischer' (LE01239888, Supporting information) – Other syntype: '907/Herb. Ledebour/*O. ammophila* Meyer/Altai 1826.' (LE01239905).

We have not yet found any further specimens of this name suitable for typification. However, according to Index Herbariorum (Holmgren et al. 1990), duplicate material from C. A. Meyer is also located in other herbaria (CAS, W, G, ROST), and specimens from the herbarium of F. E. L. von Fischer are likewise found in other herbaria (CAS, LINN). Therefore, the discovery of further suitable material is to be expected. In the herbarium specimen from the Altai, the place and year were written in ink afterwards, while the lectotype contains Meyer's familiar pencil writing. The type specimen selected here is in good condition.

The specimen LE00050154 ('*Orobanche ammo-/phila* C. A. Mey./Suppl. alter. in fl. alt. [= Bongard et Meyer, Verzeichnis der im Jahre 1838 am Saisang-Nor und am Irtysch gesammelten Pflanzen, St. Petersburg, 1841]/Nr. 217/ad lacum Saisang-/Nor') referred to as 'Typus' by Tvelev (1955) cannot be a type specimen because it was collected in 1838.

The name *O. ammophila* C.A.Mey. belongs to the synonymy of *O. coerulescens* Stephan emend. Willd.

Orobanche amoena C.A.Mey. (Ledebour 1830, p. 457)

Described from eastern Kazakhstan ['Hab. in locis rupestribus montium Arkaul in deserto soongoro-kirghisico orientali, non procul a lacu, qui Noor-Saisan vocatur (M[eyer].)'].
The type locality is currently known as Kürşım Mountains, Altai, Kazakhstan.

Lectotype (**Uhlich and Rätzel, designated here**): – '909./Legi in rupestribus montium/Arka-ul d. 14. Mai 1826/Herb. Meyer' (LE s.n., Fig. 4). – Isolectotype: '909. Herb. Ledebour. *O. amoena* Meyer. Altai 1826.' (LE00050152). – Possibly authentic material in Paris (P02982359, plants top right).

The lectotype contains relatively rich material and is in better condition than the isolectotype. The material in Paris lacks the year, even though it includes the collection number (909).

Orobanche amoena C.A.Mey. is a currently accepted name.

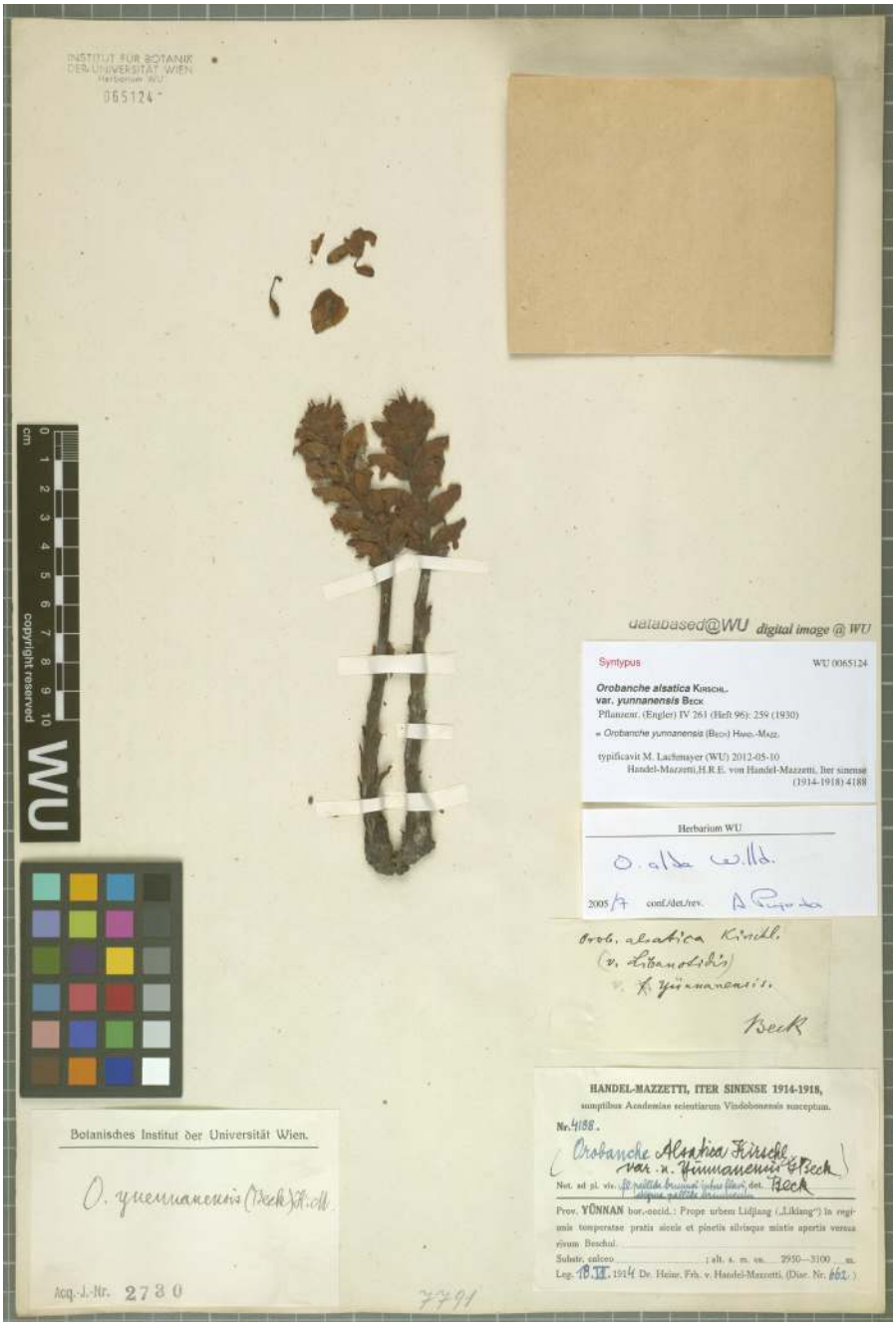


Figure 2. Lectotype of *Orobanche alsatica* var. *yuennanensis* Beck (WU0065124, designated here). Courtesy of the Botanical Institute of the University of Vienna.

***Orobanche amoena* f. *bella* Beck**
(Beck 1890, p. 149)

Described from Kazakhstan, Dshungarskiy Alatau ['Sakaman bulak (?), leg. Kuschakewicz! in herb. Petrop.'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Herbarium Horti Petropolitani/*Orobanche amoena* C. A. M./[manu? – Джунгарск. Алатау]/Чакаманъ-булакъ 5 VI [18]73 l[eg]. Kuschakewicz'. **B)** '*Orobanche amoena* C. A. M./ var. *bella* Beck, Monogr. p. 149./Determ. Olga Fedtschenko.' (LE01273313; Supporting information).

We have not yet found any further specimens suitable for typification of this name. However, the specimen does not bear Beck's usual notation. Since the revision of the infraspecific types in the St. Petersburg Herbarium is still ongoing, it cannot be ruled out that further original material will be found. The specimen selected as a lectotype is in exceptionally good condition.

According to the adopted taxonomic concept (Uhlich and Rätzel 2024), *Orobanche amoena* f. *bella* Beck is the basionym



Figure 3. Living plants of *Orobanche alsatica* var. *yuennanensis* Beck: Dorf Xuesong, Lijiang, Provinz Yunnan, 30.07.2006, Chen Bin.

of *O. amoena* var. *bella* (Beck) O.Fedtsch. & B.Fedtsch. (Fedchenko and Fedchenko 1913, p. 119)

***Orobanche amoena* f. *colossea* Beck**
(Beck 1890, p. 149)

The form was described by Beck (1890) on abundant material collected in Central Asia ['Buchara orientalis: Kurganbulak [Qurghonteppa/Kurganteppa, Tajikistan] et Hasret-Sultan in declivibus occid. montium Darwas [Darwas/Pik Garmo, Pamir Mountains, Darvaz Region, northwestern Gorno-Badakhshan, Tajikistan] V–VI 1884 leg. A. Regel [A. E. Regel, Iter Turkestanicum], Turkestania prope Pamil [Pamir Mountains, Kizyl-art/Kyzylart Pass ? on the border of Tajikistan and Kyrgyzstan] leg. Kuschakewicz [Iter Pamiricum 1878], Mongolia occid. in decliv. montis N. Thianschan [Tian Shan Mountains] leg. Przewalski [N. M. Przewalski]'].

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here): – **A)** 'Майли-сай [Pamir Mountains/Памир, Kizyl-art/Кызыл-Арт/Kyzylart Pass ? on the border of Tajikistan and Kyrgyzstan]/2.VI.[18]78/А. Кушакевич/203'. **B)** 'Herbarium horti Petropolitani./Turkestan, Pamil, 2.VI.1878, leg. Kuschakewitcz/203'. **C)** '*Orobanche* (*Trionychon**) *amoena* C.A. Meyer/f. *O. colossea* m[ihi]./det. Dr. G. Beck [manu Beck]/[*] lapsus calami! *Osproleon*!' **D)** '*Orobanche* (*Osproleon*)/*colossea* (G. Beck)/

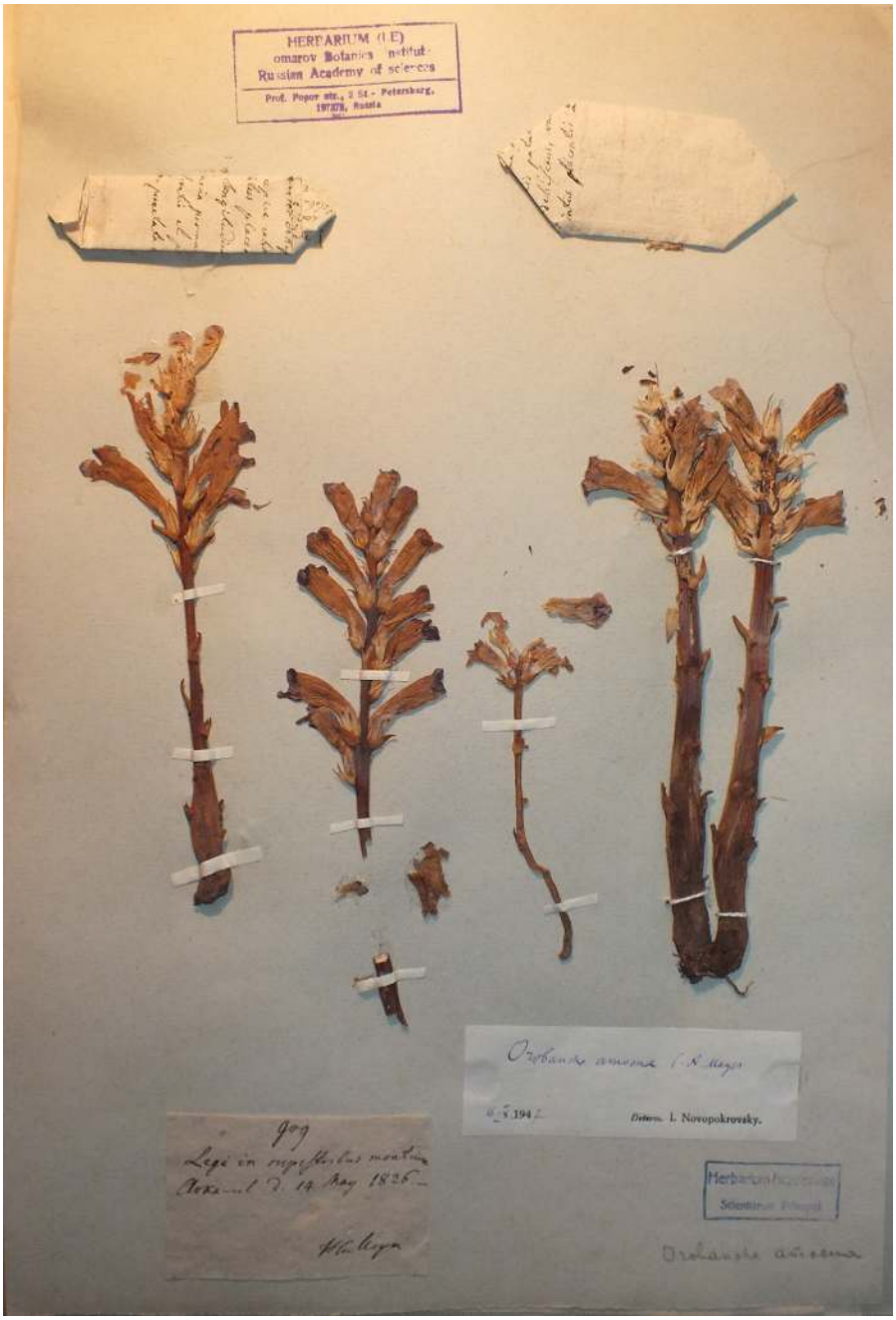


Figure 4. Lectotype of *Orobanche amoena* C.A.Mey. (LE s.n., designated here). Courtesy of Komarov Botanical Institute of the Russian Academy of Sciences St. Petersburg.

Novopokr./1949.5.I/Determ. I. Novopokrovsky'. **E)** '*O. amoena* C.A. Meyer/f. *O. colossea* G. Beck/1955.II.15 Teste: Tzvelev' (LE01283185, two plants of a single gathering; Fig. 5). – Other syntype: – **A)** 'cum 210/Herbarium horti Petropolitani./Pl. a N.M. Przewalski collectae/Mongolia occid. in decliv. montis N. Thianschan/1877/Desertum graminosum secus fl. Kungess [Künes River/Kunges River, Xinyuan County/Künes County, Yili Kazakh Autonomous Prefecture, China] inferiorum/3-3500 p. s.m. rara'. **B)** '*Orobanche amoena* C.A. Meyer/f. *O. colossea* m[ihi]./Beck [manu Beck]'. **C)** 'Syntype/*Orobanche amoena*/f. *colossea* Beck/14.05.2024, [comm.] H. Uhlich' (LE01283186, only one plant).

Other material of interest in this typification: – **A)** 'A. E. Regel, Iter Turkestanicum/Buchara orientalis: Hasret-Sultan in declivibus/occid. montium Darwas V, VI 1884/168'. **B)** '*Orobanche amoena* C.A. Meyer/v. *O. colossea* m[ihi]./det. Dr. G. Beck [manu Beck]'. **C)** '*Orobanche colossea* (G. Beck) Novopokr./24.XI.1946/I. Novopokrovsky'. **D)** '*O. gigantea* (G. Beck) Gontsch./1955.II.15 Teste: Tzvelev' (LE00050164, two plants of a single gathering).



Figure 5. Lectotype of *Orobanche amoena* f. *colossea* Beck (LE01283185, designated here). Courtesy of Komarov Botanical Institute of the Russian Academy of Sciences St. Petersburg.

Of all the material that Beck used for describing this form, we prefer the specimen collected by Kuschakewicz [Iter Pamiricum 1878] because, in our opinion, it maintains the current usage of this name. The material collected by Przewalski seems to belong to the same form. In contrast, the specimens collected by Regel – also the above mentioned specimen LE00050164 – seem to belong to *O. kotschyi* var. *gigantea* Beck in Biblioth. Bot. 19: 147, t. 2 f. 35(2) (1890) [basionym of *Orobanche gigantea* (Beck) Gontsch. in Trudy Bot. Inst. Akad. Nauk S.S.S.R., Ser. 1, Fl. Sist. Vyssh. Rast. 1: 55 (1933)]; Beck described the last taxon based on a single specimen collected by Regel [Iter Turkestanicum 1884] in this Asiatic region.

According to the adopted taxonomic concept (Uhlich and Rätzel 2024), *Orobanche amoena* f. *colossea* Beck [in Biblioth. Bot. 19: 149, t. 2 f. 37(2) (1890)] is the basionym of the name *O. amoena* var. *colossea* (Beck) Ó.Sánchez & Piwow., **stat. nov.**

Orobanche amoena var. *calycina* Reut. (Reuter 1847, p. 31)

The variety was described by Reuter (1847) on the material collected by Karelin and Kiriloff (1840) in East Kazakhstan

['In arenosis deserti Soongoro-Kirghisici ex Karelin et Kiriloff ! (v. in h. DC.)'].

Lectotype (**Sánchez-Pedraja and Piwowarczyk, designated here** [or perhaps **holotype**, cf. McNeill 2014, p. 1112 f.]): — **A)** '382 et 385. *Orobanche amoena* C.A.M./ In sterilissimis arenosis deserti Soongoro-Kirghisici/ad rivulum Donsyk non procul ab Ajagus [Ayagöz/Ayagoz (formerly Sergiopol), Ayagoz District, Abai Region (formerly part of East Kazakhstan Region), Kazakhstan]./leg. Karelin et Kiriloff, a. 1840./Soc. Imp. Nat. Cur. Mosqu.' **B)** '*Orobanche amoena* C.A. Mey./β *calycina* Reut. [manu Reuter]' (G00675825 [G-DC], with two gathering numbers [n. 382 et 385]; Supporting information). – Isolectotypes [or perhaps isotypes]: – LE01273336 [n. 382 et 385, one plant on the left side of the sheet and close to its labels]. – LE 01273344-hb. Schrenk [n. 382 et 385, two plants]. – NY05144809 and P02982356 [n. 382 et 385, two plants]). – Other syntypes: – G00675823 [G-DC] [n. 382, only one plant]. – G00675824 [G-DC] [n. 385, only one plant]. – LE01273310-hb. Turczaninov [n. 382, only one plant]. – LE01273312-hb. Turczaninov [n. 385, only one specimen]; – LE s.n.-hb. Fischer [n. 382, only one plant]. – MW0878079 [n. 382, two plants] and – MW0878080 [n. 385, two plants].

The aforementioned taxon was collected and published by Karelin and Kirilow (1841) who treated it as *O. amoena* C.A.Mey. (s. str.). Later, Reuter distinguished a variety in the Candolle herbarium based on the collection mentioned above ('382 et 385'), as he indicated in his description ('sepalis majoribus ovalibus').

In our more synthetic opinion, it fits into the variability of the species, as also concluded by Beck (1890, p. 149) ['Exsiccatae. Karelin et Kiriloff, Exs. anni 1840 nr. 382 et 385! (f. 1 ['*typica*'])'].

Orobanche amoena C.A.Mey. is a currently accepted name.

Orobanche antirrhina Reut. (Reuter 1847, p. 21)

Described from Ukraine ['In Podoliâ ad marginem sylvarum inter Zinkow [49.086035 N 27.072470 E] et Bar [49.078527 N 27.676759 E] rarissima (Godet ! 1824). *O. epithymum* var. *major* ? Godet h. ! *O. gracilis* Besser ! in h. DC. non Smith'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** '*Orobanche gracilis* Smith/Circa Nikolajef/ad Ostia Hypanis/ DC 1831/Herb. W. Besser'. **B)** '*Orobanche anthirrina* [sic] Reut./*O. gracilis* Bess! non Smith' (G00675535 [G-DC]; Supporting information).

Although the label does not correspond to the locus classicus as stated in Reuter (1847), the specimen is explicitly mentioned by Reuter (1847) in the protologue ('! *O. gracilis* Besser ! in h. DC. non Smith') and thus represents an original element suitable for typification purposes. Since no other material suitable for lectotypification was found, we select the specimen from the Besser herbarium according to Art. 9.3 ICN as the lectotype.

Orobanche antirrhina Reut. is a synonym of *O. reticulata* var. *pallidiflora* (Wimm. & Grab.) Beck.

Orobanche australiana F.Muell. (Mueller 1882, p. 98)

Described from: [Australia ('*O*[*robanche*]. *australiana*, F. v. M[uell]., inedit, ... W[est]. A[ustralia]. S[outh]. A[ustralia]. – V[ictoria]. N[ew]. S[outh]. W[ales]. – – B[entham]. fl. IV, 533')].

This is not a 'nom. nud.', because Mueller (1882) refers to a work previously published by Bentham (Fl. Australiensis IV: 533. 1868, cf. Art. 38.13 and 38.14 ICN). Bentham (1868) reported plants under the name *O. cernua* from the following locations: 'Victoria. Black Forest on *Senecio lanatus*, and Cape Grent, *F. Mueller*; Murray river, *Dallachy*. S[outh]. Australia. Near Cudnaka, *F. Mueller*. W[est]. Australia, *Drummond*, n. 185, 198; Swan River, *Oldfield*; Flinders Bay, *Collie*.'

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** '*Orobanche cernua*/Loeffl. [sic]/Cudnaka/Oct. [18]51' [manu F. Mueller]. **B)** 'National Herbarium of Victoria (MEL)/*Orobanche australiana* F. Muell./1930's to 1960's/ Annotation: J. H. Willis'. **C)** '*Orobanche cernua*/var. *australiana*/det. W. R. Barker (AD) 9. IV. 2002'. **D)** 'Syntype of *Orobanche australiana*/F. Muell. ex Tate/Syst. Census Austral. Pl. 98 (1882)/Type Status: W. A. Gebert 27 Jul 2016'. **E)** 'Type' (MEL2255072, Supporting information). – Other syntypes: – '*Orobanche cernua*/Loeffl. [sic]/W[est]. A[ustralia]./J[ames]. Dr[ummond].' (MEL2255075, MEL2255076). – '*Orobanche cernua*/Löffl. [sic]/Murray River D[allachy].' (MEL2255064). – '*Orobanche cernua* Loeffl. [sic]/specimen unicum legi prope Black/Forest in pratis siccis ut vi-/detum radici *Senecionis*/*rupicolae* adhaerens/Nov. 1849/St. Vicents Gulf Dr. M[ueller]' (MEL2255067). – 'Herb. Mus. Paris/*Orobanche cernua* Loeffl. [sic]?/Nouvelle Hollande occidentale./R. des cygnes (Swan-river). Drummond. 1843./198.' (P02985701, G s.n.).

We selected the above-mentioned specimen from the rich material in Melbourne because it is in the best condition in comparison with the others.

Orobanche australiana F.Muell. is a basionym of the currently accepted name *O. cernua* var. *australiana* (F.Muell.) Beck.

Orobanche bicolor C.A.Mey. (Ledebour 1830, p. 458)

Described from: [Kazakhstan ('Hab. in deserto soongoro-kirghisico occidentali hinc inde locis argillosis, nec non in locis sabulosis ad ripam rivuli Tschaganka versus radicem montis Tschingistau (M[eyer].)')]. The indicated type locality is Şagan River in Şyñğystau Mts, Kazakh Uplands, Kazakhstan.

Lectotype (**Uhlich and Rätzel, designated here**): – '905./Herb. Ledebour/*Orobanche bicolor*/Meyer/Altai 1826' (LE01015420, Supporting information). – Isolectotype: (P02968171, the three plants on the left). – Authentic herbarium specimens: – '*Orobanche bicolor*/fl. alt. II p. 458/ [добавлено] дублет типа' (LE010015419). – **A)** 'N. 953/Altai/Kar.' **B)** '*Orobanche bicolor*/Fl. Alt./(illeg.)'. **C)** 'Herbarium Proprium/Turczaninovii' (LE00050157).

We place the name *Orobanche bicolor* C.A.Mey. in the synonymy of *O. cernua* var. *cumana* (Wallr.) Beck.

***Orobanche bovei* Reut. (Reuter 1847, p. 24)**

Described from Algeria ['In Algeriâ (Bové ! sub n. 224 cum aliâ spec, in h. Boissier mixtâ, in h . mus. Par. sub n. 137), ad radices *Hyoseridis radiata* (Bové !)'].

Lectotype (**Uhlich and Rätzel, designated here**): – 'Nr. 33 in Prodr./Herb. Mus. Paris/137 *Orobanche bovei* Reut./ Alger. in rad. *Hyoseris radiatae*/Bové' (G00675566 [G-DC]; Supporting information).

In the protologue, Reuter mentioned a specimen no. 224 in the Herbarium Boissier (not seen) and another under no. 137 in the Herbarium Paris. We do not know whether, in addition to the type specimen from Genève, another specimen exists in Paris (P).

In our opinion, this plant is closely related to *Orobanche minor* s.l., however, there are a large number of very closely related species, especially in the Mediterranean region. The name cannot (yet) be definitely assigned to a particular species – also due to the poor condition of the material – so we are provisionally placing it in the synonymy of *Orobanche minor* Sm.

***Orobanche carotae* Des Moul. (Des Moulins 1835, p. 78)**

Described from France ['Aucune plante n'est plus vulgaire que la Carotte sauvage, et pourtant je n'ai trouvé que deux fois son *Orobanche*, qui paraît n'avoir été observée par aucun botaniste. Je la découvris à Lanquais, le 6 juillet 1827, dans un champ de blè non encore moissonné (ses fleurs plus fraîches). J'en trouvai deux pieds adhérens à des *Daucus* non fleuris. L'une de ces Orobanches n'avait qu'une tige, l'autre en avait neuf. Le 21 juin 1828, et très près de la localité précédente, je retrouvai la même espèce assez abondante, dans une petite frice pierreuse, où elle croissait mêlée avec l'*O*[*robanche*] *serpylli*, dont elle se distinguait au premier coup-d'œil par la petitesse de ses fleurs. Les pieds de *Daucus* étaient fort petits, sans fleurs, et toutes leurs Orobanches étaient desséchées, à l'exception de deux petites tige qui me permirent de rédiger une description. Le propriétaire de cette localité précieuse l'a défrichée, et toutes mes autres tentatives pour retrouver l'*O*[*robanche*]. *carotæ* ont été inutiles']. [English translation: 'No plant is more vulgar than the Wild Carrot, and yet I have only found its *Orobanche* twice, which does not appear to have been observed by any botanist. I discovered it at Lanquais, on July 6, 1827, in a field of wheat not yet harvested (its flowers fresher). I found two plants adhering to non-flowering *Daucus*. One of these Orobanches had only one stem, the other had nine. On June 21, 1828, and very close to the previous locality, I found the same species quite abundant, in a small stony frice, where it grew mixed with the *O*[*robanche*] *serpylli*, from which it was distinguished at first glance by the smallness of its flowers. The *Daucus* plants were very small, without flowers, and all their Orobanches were dried up, with the exception of two small stems which enabled me to write a description. The owner of this valuable locality has cleared it, and all my other attempts to find the *O*[*robanche*]. *carotæ* have been useless.']

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** '*Orobanche Dauci Carotae* Des Moul./Herb. J. Gay./Presented by Dr. Hooker, February 1868/Lanquais, près Bergerac, dépt. de la Dordogne,/le 21. Juin 1828. – Particulièrement sur la route de Lanquais à Couze[-et-Saint-Front], au dessus de la Condamine,/sur une pelouse sèche (Des Moulins)/Des Moulins/misit Nov. 1834.' **B)** 'Reuter rapporte avec donte l'*Orob.*/*carotae* Des Moul. à son *O. minor* β *flavescens* (DC. Prodr. XI. p. 29)' (K000759351, Supporting information). – Isolectotype: (K000759350). – Other syntype: – '*Orobanche Dauci Carotae* Des Moul./Herb. J. Gay./Presented by Dr. Hooker, February 1868/Varennes, près Lanquais, dans un champ/de bléd, le 6 Juillet 1827 (Des Moulins)/Des Moulins/misit Nov. 1834.' (K000759353!, mounted with the lectotype).

The original material does not explicitly indicate that the plants were parasitic on *Daucus carota* L.

We exclude the specimen WU077710 ('*Orobanche carotae*/Des Moulins/Trouvé près Lanquais, le 6/Juillet 1827, dans une piece de blé./Com. Des Moulins/1834') from consideration because, subject to a more detailed examination, its affiliation to *O. picridis* is questionable (*O. minor* s.l.?).

We place the name *Orobanche carotae* Des Moul. in the synonymy of *O. picridis* F.W.Schultz.

***Orobanche cernua* f. *tenuisepala* Beck (Beck 1890, p. 143 ff.)**

Described from southwestern Tajikistan ['Turkestania: ... in planitie Kickdan ad montes Gasi Machik et prope Gomut [Gazi-Maylik, ca 38 N, 68.37 E, mts. between the rivers Kafirnigan and Vakhsh, and Iomut Village on their eastern side] (f. 5 leg. Regel)'].

Lectotype (**Uhlich and Rätzel, designated here**): – 'A. Regel Iter Turkestanicum./*O. cernua* Loefl. [manu Beck]/f. *O. tenuisepala* Beck [manu Beck]/Planities Kiik-dan in radicibus montium Gasi-Mailik/orientalibus 15[Julian cal.]–27[Gregorian cal.]/V 1883' (LE01274041, Supporting information). – Other syntype: – 'A. Regel Iter Turkestanicum./*O. cernua* Loefl. [manu Beck]/f. *O. tenuisepala* Beck [manu Beck]/Jomut in decliv[ibus]. orient[alibus]. montium Gasi-Mailik/3000' 13–25/V 1883' (LE01274040, mounted with the lectotype).

The plant has a dense, multi-flowered inflorescence, corollas up to 17 mm and a calyx with long, narrowly extended calyx teeth, which are up to 1.5 (–2.0) times as long as the connected part of the calyx segments. In agreement with Novopokrovsky (in sched. 31 May 1949: '*O. inconspicua* Gontsch.?') and Tzvelev (18 Feb.1955: '*O. hansii* Kerner'), we place the name in the synonymy of *O. hansii* A.Kern.

***Orobanche coerulescens* var. *bicolor* O.Kuntze (Kuntze 1887, p. 225)**

The variety was described by Kuntze (1887) on material collected in the Russian Turkestan, former part of the Russian Empire ['Turkmenien (present-day Turkmenistan);

die häufigste']. C. E. O. Kuntze (1843–1907) collected in Turkmenistan mostly near Aschabad.

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here): – **A)** '*Orobanche coerulescens* Steph./β *bicolo*r m[ihi]./Turkmenien/V.86/Herbarium Otto Kuntze./...'. **B)** '1 of 2/Syntype of:/*Orobanche coerulescens*/β *bicolor* Kuntze/1887 Acta Horti Petropol. 10: 225/loc.: Turkmenien Mai 1886/verif. T. Zanoni 1980'. **C)** 'Herbarium of Otto Kuntze/Presented by Mr. Andrew Carnegie/1908' (NY00312478, we choose as lectotype this single gathering formed by three sheets very well preserved; Supporting information). – Isolectotype: – **A)** '*Orobanche coerulescens* Steph./β *bicolor* m[ihi]./tubus cerulescens labia violacea/... in Turkmenien/V.86/479a Herbarium Otto Kuntze'. **B)** '1 of 2/Syntype of:/*Orobanche coerulescens*/β *bicolor* Kuntze/1887 Acta Horti Petropol. 10: 225/loc.: Turkmenien 479a Mai 1886/verif. T. Zanoni 1980'. **C)** 'Herbarium Otto of Kuntze/ Presented by Mr. Andrew Carnegie/1908' (NY00312477, a split specimen in not very good condition, in company of its host).

The taxon treated here corresponds to *O. amoena* C.A.Mey. (s. str.). Obviously, Kunze confused this species with the hairy morphotype of *O. coerulescens* Stephan emend. Willd.

Orobanche delilei Decne. [sphalm. 'delilii'] (Decaisne 1835, p. 201)

Described from Egypt ['Dans les jardins du Caire, où il croît sur les racines des choux et des mélongènes']. Decaisne (1835) refers in the protologue to the collection of '*Orobanche ramosa* Delile, Fl. Egypt. ex Herb. (*Orobanche*, Bové n. 260)'.

Lectotype (**Uhlich and Rätzel, designated here**): – '260/*Orobanche delilei* Decne./tiges brunes, fleurs bleues, azur./Parasite sur les racines des/choux et des melongènes/ am. Bové' (P02970737, Supporting information).

The herbarium specimen selected as lectotype corresponds in its label data to the protologue.

In contrast, it cannot be said with certainty whether the other specimens from Bové ['*Orobanche delilei* Decaisne/ Egypte./Bové!' (BR0000031260381). – 'fl. bleues/ sur choux et *Sol*[*anum*]. *melongena*/environ du Kaire/ Bové'(MPU023689). – '*Orobanche delilei* Dcne./Caire, m. Bové' (P02970738). – **A)** '*Orobanche ramosa*/Dans les champs d'Egypte/sur les racine des choux et/melongene/ Decembre Bové.' **B)** 'Herbier du Jardin botanique de l'Etat/ Bruxelles/an *Orobanche ramosa* L.' (BR0000031270151)] also represent original material, because reliable references to the protologue are missing. The widely distributed collection *Kotschy 430* does not represent original material, since it was collected in 1841 in Iraq (Mosul).

Beck (Beck 1890, p. 101) combined a form – *O. aegyptiaca* [var. *typica*] f. *delilei* (Decne.) Beck in Biblioth. Bot. 19: 101 (1890) – with very large, sessile or almost sessile flowers, but it can already be seen in the lectotype that the flowers have short flower stems. The characteristics mentioned by Beck (1890) belong to the variability of the species, so we place the name *Orobanche delilei* Decne. in the synonymy of *Phelipanche aegyptiaca* (Pers.) Pomel.

Orobanche gontscharovii Novopokr. & Nepli [sphalm. 'gontscharvii'] (Novopokrovsky 1950, p. 316 f.)

Described from Tajikistan ['Habitat: Asia media: Uzbekistan, Tadshikistan; Iran. Typus. Pamir occidentalis, Chorog, 2320 m s. m., 9 VII 1942, G. Nepli'].

Holotype: – **A)** 'Гербарий Таджикского Филиала/ Академии Наук СССР/Е. А. Варивцева и Г. Н. Непли/ На *Atraphaxis spinosa* L./Южный Таджикистан/Предгорья хр. Гардани-Уштри./Западный склон./Пестроцветы. *Atraphaxis* с/парнолистником. -1000 мт/26 VI 1948 № 1286.' **B)** '*Orobanche Gontscharovii*/Novopokr. et Nepli/ typus!/13 IX 1948 Determ. I. Novopokrovsky.' **C)** 'Corolla 12 mm longa, calycis dentes tubo suo breviores. Antherae subglabresc[ens] v[ersus] basi pilis paucis praediti. Squamae late ovatae, ca 5 mm longae' [manu Novopokrovsky]. **D)** 'Typus!' E) '= *O. camptolepis* Boiss. et Reut./15 II 1955 Teste: Цвелев' (LE00050167; Supporting information).

The name *Orobanche gontscharovii* Novopokr. & Nepli belongs to the synonymy of *O. camptolepis* Boiss. & Reut.

Orobanche grisebachii Reut. (Reuter 1847, p. 28)

Described from Turkey and Greece ['In campis aridis prope Egirdir Pamphyliae et in planitie Spartae [Eğirdir and Isparta, Isparta Province] ad radices Cichoracearum et Leguminosarum annuarum parasitica (v. Heldreich!) In Cariâ [Caria (SW Turkey)] (Pin.! pl. exs. 1843), in Rumelie peninsulâ Hajion-Oros [Mount Athos, Chalkidiki, Greece] ad radices *Campanulae persicifoliae* (Griseb.!)'].

Lectotype (**Uhlich and Rätzel, designated here**): – '795./*Orobanche grisebachii* Reut./ad radices cichoracearum./ tige jaune – corolla blanche, stigmate jaune pâle/in campis aridis prope Egirdir 2 juni./Heldreich 1845' (G00192006, Supporting information). – Isolectotypes: – 'De Heldreich pl. Orientales/*Orobanche grisebachii*/Reuter!/ad radices Cichoracearum pr[ope]./Egirdir Pisidiae/2 Juni 1845' (P02968129). – 'De Heldreich pl. Orientales/*Orobanche grisebachii*/Reuter!/ad radices Cichoracearum/in aridis pr[ope]. Egirdir Pisidiae/2 Juni 1845' (P02968130). – Other syntypes: – **A)** '766/*Orobanche grisebachii* Reut./tige jaunatre, corolla blanche legèrament/teinte de violacé, stigmate violacé./in campis arenosis incultis. Plaine d'Isbarta/ (illeg.) du Bouldour [Caria] ad rad[ices]. Cichoracear[ae]. et Leguminosae/30. Mai 1845 Heldreich'. **B)** '*Orobanche Grisebachii* Reut. in DC./prod. 11 p. 28/*O. condensata* Griseb. non Moris' (G0192005). – '*Orobanche*/Caria 1843 C. Pinard' (G0192007). – '*Orobanche grisebachii* Reut./ DC. Prodr./ad Cichor. et Legum. planitici/Isbarta/de Heldreich/Mai 1845' (G0192018, P00072206, E00265896, LE01323187, LE01323188).

The specimen selected as a lectotype is in exceptionally good condition.

Orobanche grisebachii Reut. is a currently accepted name.

Orobanche haenseleri Reut. (Reuter 1847, p. 22)

Described from Spain ['in Hispaniae australis regni Granatensis Sierra de Junquera [Sierra de las Nieves, above Yunquera, Málaga, Spain] (Haenseler) ... (v. in h. Boiss.)'].



Figure 6. Lectotype of *Orobanche haenseleri* Reut. (G00383275, designated here), or perhaps holotype. Courtesy of Conservatoire et Jardin botaniques de Genève.

Lectotype (**Sánchez-Pedraja, Piwowarczyk, Uhlich and Rätzel, designated here**, [or perhaps **holotype**, cf. McNeill 2014, p. 1112 f.]): – **A)** '*Orobanche*/*haenseleri* Reut. [m. Reuter]/In Sierra Junquera/P. H[aenseler]./st[aminae]. basi hirsutae [m. Haenseler]'. **B)** '*Orobanche haenseleri* Reut. in DC./prod. [m. Reuter]' **C)** 'Conservatoire botanique, Genève/Herbier Boissier, séries n'ayant pas/servi à la rédaction du/Flora Orientalis'. **D)** 'Seen for taxonomic revision of *Orobanche*/M J Y Foley/University of Lancaster MJYF. I/1998'. **E)** 'Holo-Typus [m. ignota]' (G00383275, is composed by only one plant and some fragments; Fig. 6).

Already Burdet et al. (1988, p. 728, sub 'Typus') indicated the locus classicus of the species, but did not perform any lectotypification because according to them there was no material in G for this ('Typus: … Obs. 1. Il n'existe dans les herbiers de Genève aucun échantillon correspondant rigoureusement

aux éléments du protologue' (Burdet & al. 1988, p. 728). In this little-known work, the types of *Orobanche castellana* Reut. and *O. haenseleri* Reut., the lecto- and syntypes of *O. hispanica* Boiss. and *O. minor* var. *flavescens* Reut. (all G s.n.) are discussed. *Orobanche ramosa* var. *lanata* Boiss. and *Phelipaea caesia* (Rchb.) Reut. are merely mentioned.

At least there is one specimen that we can cite. It would be strange if Haenseler had only sent a plant to his friend Boissier. Moreover, if Burdet did not see this, he could also have missed another one, perhaps mounted with another similar species for comparison, as was common practice at that time. Or perhaps they only saw the sheets (G00675560[G-DC] and G00432717 [duplicates in Kew: K000759367 and K 000759368]) collected by Boissier and Reuter (his curator) in 1849 (at the loc. class.) after the publication of 'Prodromus'.

The taxon was placed in the subsection *Glandulosae* Novopokr. by Beck (Beck 1890, p. 215 f., Beck 1930, p. 165 f.), but in our opinion, due to its habit (e.g. the absence of red glands on the entire plant and the absence of purple veins on the corolla, which is the exception in the subsection *Glandulosae*) it likely belongs to the subsection *Curvatae* Piwow., Ó. Sánchez & Moreno Mor.

Orobanche haenseleri Reut. is a currently accepted name.

Orobanche hansii A.Kern. (Kerner 1870, p. 111 ff.)

Described from the Indian state of Himachal Pradesh ['Parasita in radicibus Artemisiarum in Himalajae valle Bhagae [Bhaga Valley, near Kyelang] juxta fluvium et in montium lateribus, passim 10 000–11 000 ped. sup. mare'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** '*Orobanche* spec. nov. ([Th.] Thoms[on].)/*Or*[*obanche*] *coerulescens* ([W. S.] Kurz)/Parasita in radicibus *Artemis*[*iae*]. *maritimae*,/in valle Bhagae passim, juxta flu-/vium 10 000', et in montium lateribus ad 11000'./Cor[olla] coerulea' [leg. H. A. Jaeschke; manu Jaeschke]. **B)** '*Orobanche hansii* K./nov. pl. sp. dec. II/Kerner' [manu Kerner]. **C)** 'Syntypus WU 0143689/*Orobanche hansii* A. Kern./Ber. Naturwiss.-Med. Vereins Innsbruck 1–2: 111–112 (1870)/typificavit D. Reich (WU) 2024-03-25/unclear s.n [s.d.]' (WU0143689, Fig. 7).

We have not yet found any further specimens suitable for typification of this name. However, according to our knowledge, material from H. A. Jaeschke (also specimen of various types) is located in both herbaria (W and WU) in Vienna. Therefore, the discovery of further suitable material (isotypes) is to be expected.

The species epithet '*hansii*' refers to the Herrnhut gardener and botanist [Ernst] Wilhelm Hans (June 24, 1840–February 4, 1896). Kerner (1870, p. 113) writes in the protologue: '*In dankbarer Erinnerung an meinen verehrten Freund Hans in Herrnhut, dessen gütiger Vermittlung ich eine umfangreiche Collection von Pflanzen aus dem Himalaja verdanke, habe ich diese ausgezeichnete schöne Art Orobanche hansii benannt.*' However, the type specimen was not collected by W. Hans, but by Heinrich August Jaeschke (Mai 17, 1817–September 24, 1883), also a member of the Moravian Brethren. From 1857 to 1868, Jaeschke was a missionary of the Moravian Brethren in Kyelang, Lahaul District and Spiti in North India.

Orobanche hansii A.Kern. is a currently accepted name.

Orobanche ianthina Franch. (Franchet 1884, p. 227)

The species was described on the material collected by Guillaume Capus, apparently in the first of his expeditions to Middle Asia between 1880 and 1882. This material was studied by another French botanist Adrien Franchet in his 'Plants of Turkestan' published in 1883–1884 (Turdiboev et al. 2022, p. 230). Turkestan was a historical region located in that today is Central Asia and from this region Franchet described his new species ['Ansab, vallée du Jagnaous (Anzob, Ayni District, Sughd Region, Tajikistan), alt. 2200 mètres; 4 juillet, n. 1019. Gorge de Tchoukalik (Chukalik mountain/pass, Ourmitane/Urmetan, Ayni District, Sughd province, Tajikistan); 16 juin, n. 1018'].

Lectotype (**Sánchez-Pedraja and Piwowarczyk, designated here**): – **A)** '1018 Herb. Mus. Paris./*Orobanche ianthina* Franchet/Gorge de Tchoukalik [Chukalik mountain/pass, Ourmitane/Urmetan, Ayni District, Sughd province, Tajikistan], 16 Juin/M. Capus Plantes du Turkestan. 1881./Reçu le 27 Octobre 1881'. **B)** 'Etamines inserées vers le/tiers du tube de la corolle ... dans leur partie sup. [+ two sketchs one of the calyx and another of the staminal filaments]' (P02982329, Supporting information). – Other syntype: – **A)** '1019 Herb. Mus. Paris./*Orobanche ianthina* Franchet/Ansab [Anzob, Ayni District, Sughd Region, Tajikistan], 4 Juillet./M. Capus Plantes du Turkestan. 1881./Reçu le 27 Octobre 1881'. **B)** 'filets staminaeus inserées/vers le tiers inférieur ou un peu au dessus ... poils' (P02982327, the gathering consists of two plants attached by the base).

Today this taxon is usually considered subordinate to *O. amoena*. Beck (1890) treated it as a form of this species [*O. amoena* f. *ianthina* (Franch.) Beck in Biblioth. Bot. 19: 149 (1890)], while other authors prefer to treat it as synonymous with *O. amoena* var. *calycina* Reut.

However, we consider this taxon as different from Reuter's one. According to the adopted taxonomic concept (Uhlich and Rätzel 2024), we prefer to use the varietal rank for it, so *Orobanche ianthina* Franch. [in Ann. Sci. Nat., Bot. sér. 6, 18: 227 (1884)] is the basionym of the name *O. amoena* var. *ianthina* (Franch.) Ó.Sánchez & Piwow., **stat. nov.**

Orobanche indica Wall., non Roxb. nec Spreng. (Wallich 1831, n. 3966), nom. nud., nom. inval.

Mentioned from India, Bangladesh and Nepal ['3966 *Orobanche indica* Roxb./A – Hb. [B.] Heyn[e]./B – e Patinitola [= Patnitala, Naogaon Distr., Bangladesh] et *Orob*[*anche*]./*Hada* e Patna. H[erb]. Ham[ilton]./C – *squamosa* Thunb[erg]. W Nepal/D Patna R. B./E Turraya regn. or. Oude [= Awadh State, Uttar Pradesh, N-Indien] et Napalia [= Nepal]/1820 et 1825'].

Authentic material (cited by **Uhlich and Rätzel**): – '*Orobanche indica* Roxb./3966 E/Patna R. B./Wallich' (G00237619, left plant [mixed collection with *Phelipanche*]; Supporting information). – **A)** 'Found between Jagtan(illeg.)/and Chaundporrnah(?)/Grow in fields./3966 *Orobanche indica*/February 25'. **B)** 'Hindustan (illeg.) This is found in



Figure 7. Lectotype of *Orobanche hansii* A.Kern. (WU0143689, designated here). Courtesy of the Botanical Institute of the University of Vienna.

(illeg.)/village, near Patna, grown in tobacco fields. The flowers/appears to (illeg.) a colour of purple & whitish, staminis white/stem the (illeg.) Calyx little yellowish & whitish &/full of white hairys (illeg.) This is found in the/Month of March in flower. 4966 ? *Orobanche indica*'. **C)** '*Orobanche*/*indica*/3966 E?/Inter *Sinapis* in agris ad Mooghery [= Moākhera]' (K001117754, the right 5 plants). – '*Orobanche*/*squamosa*? Pers./near Neelgherry [= Nilgiri Himal, W Nepal]/April 1810[?]' (K001117753). – 'Herbarium Richau/3966 c *Orobanche indica* Roxb./Turraya regn. or. Oude et Napalia/ Communicavit Wallich' (P02982330). – '*Orobanche indica* Roxb./Turraya regn. or. Oude et Napaliae/Wallich herb. ind. n. 3966 E/(illeg.)' (P02968093). – *'Orobanche indica* Roxb./Nepal E. d. C./Wall. Cat. 3966 E' (E00209635, left plant, LE01323189). – *'Orobanche indica*/3966.A/[Schede in the form of a copy of the protologue]' (K001117750). – **A)** '[Schede in the form of a copy of the protologue]/3966 E'. **B)** '*Orobanche cernua* Loeffl. [sic]/India. Wallich, Cat. 3966 E/det. Calcutta 1976' (L.2817691, upper row and left plant of the lower row). – **A)** *'Orobanche indica* Roxb./fl. ind. 3, 27. Benth. Scroph. Ind. 55./S[prengel]. 2, 817./Hab. in Hindustania, Oude, Napalia'. **B)** 'British East. Indies/ Wallich Cat. 3966 E/= *O. cernua* Loeffl. [sic]' (L2817692). – **A)** '*Orobanche hada*/3966.B/Patna 18. March 1812'. **B)** '*Orobanche indica*/3966.B/23 Jany [sic] 1808' (K001117751, left plant; the collection K001117752 = the two lower plants

also belong to this, but contains only *Phelipanche aegyptiaca*). – '*Orobanche indica* Roxb./3966 C/Hindustania/Wallich' (G00237618).

We place the name *Orobanche indica* Wall. in the synonymy of *Orobanche cernua*.

Orobanche insignis E.D.Clarke (Clarke 1814, p. 42)

The species was described from Egypt by the English naturalist Edward Daniel Clarke (1769–1822) ['This was also found between Aboukir (Abu Qir, Alexandria) and Rosetta (Rosette/Rashid, Beheira), at the same time'].

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here [or perhaps holotype]): – **A)** '*Orobanche insignis* E.D./Clarke, Travels 2(2): 41/(1814)'. **B)** 'Between Aboukir & Rosetta, Dr. E.D. Clarke'. **C)** 'Herb. rev. E.D. Clarke – Purchased from Saffron Walden Museum 1934'. **D)** 'Type Specimen/*Orobanche insignis* E.D./Clarke, Travels 3(2): 41/(1814)'. **E)** 'Flora of Egypt *Orobanche insignis* E.D. Clarke/Locality: between Aboukir and/Rosseta, Date: April-May 1801/Coll. E.D. Clarke' **F)** '*Orobanche insignis* E.D. Clarke/«A magnificent non-descript species of *Orobanche* ... We have called it *Orobanche insignis* ...»' (BM000606304, only one specimen with darker lobes; Supporting information).

This name is apparently the oldest name for this species in the Egypt land backed by herbarium material (see *Cistanche tubulosa* (Schenk) Hook.f. below). Nevertheless, we suppose that *Lathraea quinquefida* Forssk. (1775) has priority, which, however, is not supported by any herbarium material (Moreno Moral et al. 2018, p. 24). Therefore, *Cistanche tinctoria* (Forssk.) Deflers (1896, p. 327) is, in the authors' opinion, the correct name for this taxon (cf. Moreno Moral et al. 2018).

Orobanche karatavica Pavlov (Pavlov 1951, p. 94)

The species was described from: [Karatau Mountains (Jambyl Region, Kazakhstan)] by Nikolai Vasilievich Pavlov (1893–1971), at that time Director of the Institute of Botany of the Academy of Sciences of the Kazakh SSR, who referred the species epithet to the site of discovery in the Karatau Mountains.

Holotype (Pavlov 1951, **p. 94):** — **A)** 'Южно-Казахстанская экспедиция КФАН 1940 г./Н. В. Павлов. Растения Сыр-дарьинского Каратау и бассейна р. Чу. [N.V. Pavlov. Plants of the Syr-Darya Karatau and the Chu River Basin.]/*Orobanche karatavica* N. Pavl sp. n./Каз. ССР Джамбульская обл. [Kazakh SSR, Dzhambul Region/Jambyl Region], горы Каратау [Karatau mountains], …/по скалистым склонам ущелья, под вершиной Минжелке [on the rocky slopes of the gorge, under the summit of Minshelke]/Цв. белые или едва синеватые [Color white or slightly bluish]/30 VI 1940 г./№ 796/ Leg.-Det. Н.В. Павлов [N.V. Pavlov]'. **B)** 'Typus'. C) '*Orobanche uralensis*/G. Beck/ssp. *Karatavica* (N.V. Pavlov in herb) Novopokr/1949.7.IV Determ. I. Novopokrovsky' . D) '*Orobanche karatavica*/N. Pavl [envelope]' (AA, a single gathering which consist of three plants and the host-plant and a small envelope with fragments). – Isotypes: – '*Orobanche karatavica* N. Pavl. sp. n./Каз. ССР/Джамбульская обл. [Jambyl Region/Dzhambul Region] горы Каратау [Karatau Mountains], на полыни по каменистым склонам ущелья, под вершиной Минжелке, цв. белые или едва синеватые/1940.30.VI № 796 Leg. et det. N.V. Pavlov' (MW0594766, a single gathering which consist of three plants and a host plant; Supporting information; LE [not seen]; Novopokrovsky and Tzvelev 1958, p. 54).

The taxon described by Pavlov, in our opinion, should go to the synonymy of *Phelypaea pallens* [Bunge ex Ledeb., Fl. Ross. 3: 312 (1847–1849 [Jun 1849])]. We have seen original specimens (syntypes) of this species in P (Muséum national d'Histoire naturelle [P02982379-hb. Cosson (ex herb. Al. de Bunge); P02970913-hb. Cosson (ex herb. Al. de Bunge)] (Uhlich and Rätzel 2024). Ledebour's species was also described from Kazakhstan (Ledebour 1849, p. 312; Uhlich and Rätzel 2024).

Pavlov's species was included in *Phelipanche pallens* as a variety by Teryokhin, in Opred. Rast. Sred. Azii 10: 51 (1993) [*P. pallens* var. *karatavica* (Pavlov) Teryokhin], but in our opinion it must be treated as a mere form, little pigmented, with low taxonomic value. In addition, we want to point out that the synonymy given by POWO (Govaerts et al 2021) does not make any sense; they place the name in the synonymy of *O. picridis-hieracioides* [Vaucher ex] Holandre, Fl. Moselle: 322 (1829) [= *O. picridis* F.W.Schultz in Bot. Lit. Blätt. 5: 504 (1830)]. The only explanation to this error is that perhaps the species *Phelypaea pallens* Bunge ex Ledeb. [Fl. Ross. 3: 312 (1847–1849] was, apparently, confused with *Orobanche pallens* F.W.Schultz in Flora (Regensb.) 23: 128 (1840), pro syn. (= *O. picridis* F.W.Schultz in Bot. Lit. Blätt. 5: 504 (1830)), but this error has already been corrected by Novopokrovsky & Tzvelev (1958), who used the name of *Orobanche uralensis* Beck (1890).

Nomenclatural novelty: *Phelipanche pallens* f. *karatavica* (Pavlov) Ó.Sánchez & Piwow., **stat. nov.** Basionym: *Orobanche karatavica* Pavlov in Vestnik Akad. Nauk Kazak. SSR 4 (73): 94 (1951).

Orobanche kashmirica Clarke ex Hook.f. (Hooker 1884, p. 324)

The species was described from the northern part of the Kashmir valley ['Kashmir; at Tilail [Gurez, Bandipora district, Jammu and Kashmir, India], alt. 11,000 ft., Clarke'].

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here [or perhaps holotype]): – **A)** 'Pale brown «Henunyii»/*Orobanche kashmirica* C.B. Clarke/ Kashmir/30687 Tilail 11000 [ft.]/24 Aug 1876/Coll. C.B. Clarke Comm. 10/77'. **B)** '[+ sketches: Bract/No bracteoles – Calyx – Anther] n. 30687 *O. Kashmirica*' (K000061388, Supporting information).

According to current knowledge, we accept this name for a poorly known species, which is probably 'Endemic to Kashmir' (Jafri 1976, p. 15; Jafri 2011).

Orobanche kotschyi Reut. (Reuter 1847, p. 33)

The species was described from Southern Iran ['In Persiâ australi (Kotschy! pl. pers. austr. exsicc. n. 891) ... (v.s. in h. Boiss.)'].



Figure 8. Lectotype of *Orobanche kotschyi* Reut. (G00150212, designated here), or perhaps holotype. Courtesy ofConservatoire et Jardin botaniques de Genève.

Lectotype (**Sánchez-Pedraja and Piwowarczyk, designated here** [or perhaps **holotype**, cf. McNeill 2014, p. 1112 f.]): – **A)** 'Kotschy Pl. Pers. austr./891/*Orobanche Kotschyi* Reut.' **B)** '*Orobanche Kotschyi* Reut./in DC. Prod. [manu Reuter]' **C)** '*Orobanche Kotschyi* Reut. [m. Reuter]/ Kotschy 891' (G00150212, Fig. 8; the sheet contains two specimens of a single species and gathering (Turland et al. 2025: Art. 8)). – Isolectotypes [or perhaps isotypes]: – idem ['Th. Kotschy. Pl. Pers. austr. Ed. R. F. Hohenacker. 1845' n. 891] (P00603108-hb. Steudel; LE01323171, P00603109, K000061357, the bigger specimen on left side of the sheet).

Among all syntypes, we choose the G-BOIS sheet because it was the one used by Reuter in his description of the species.

Beck (1890, p. 133) placed this species in his *Orobanche* trib. *Coerulescentes* Beck (1890), nom inval., in *O.* subsect. *Inflatae* Beck (1890) and in *O.* ser. *Crassicaules* Novopokr. by Novopokrovsky and Tzvelev (1958: 'Parasitize on carrot family [*Apiaceae*]') = *Orobanche* sect. *Kotschyinae* Teryokhin (Teryokhin et al. 1993, p. 40; Teryokhin 1997, p. 20). Obviously, this species is the type of Teryokhin's section.

Orobanche kotschyi Reut. is a currently accepted name.

***Orobanche kotschyi* var. *multiplex* Beck (Bornmüller 1904, p. 680)**

The variety was described from northern Iran ['Persia borealis: montium Elburs [Alborz mountain range] in valle Lur [Lar valley, Lar National Park, Mazandaran Province-Tehran Province, northern Iran] ad pagum Getschesàr, 2200 m. s. m.; 22.VI.1902 (Bornm., iter Persicum II, n. 7931)'].

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here [or perhaps **holotype**]): – 'No. 7931/*Orobanche kotschyi* Reut./f. *multiplex* Beck .../(f. nov.)/determ. Beck/Persia borealis: in valle Lur (Elburs) ad/pagum Getschesàr/2200–2300 m. s. m./1902.22.VI. leg. J. et A. Bornmüller' (JE00015467, Supporting information; the sheet contains two plants of a single taxon and gathering).

Beck (Bornmüller 1904, p. 680) treated this taxon as a variety of the morphologically variable *O. kotschyi*, which is likely the most suitable treatment for the hairy forms of this species in this region. Morphologically similar plants have been collected in the Kopet Dag (Turkmen-Khorasan Mountain Range, on the border between Turkmenistan and Iran) (MW0878166).

This variety seems to be morphologically very close to *O. kotschyi* var. *spectabilis* (Reut.) Beck (1890, p. 147) [basionym of *O. spectabilis* Reut. in Boiss. and Reut. in Nouv. Mém. Soc. Imp. Naturalistes Moscou 12: 169 (1860) [Boiss. and Buhse, Aufz. Transkauk. u. Pers. Pfl.: 169 (1860)], but their real relationship must be established using molecular methods.

***Orobanche latisquama* f. *ochroleuca* Maire (Maire 1935, p. 220)**

The form was described from: ['Canastel'], a place and promontory close to ['Oran' (Algeria)] by the French botanist and mycologist René (Charles Joseph Ernest) Maire (1878–1949).

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here [or perhaps **holotype**]): **—** 'Dr. R. Maire - Itinera Algerica/1934/*Orobanche latisquama* (Schultz) Benth. et Hook. [sic]/forma *ochroleuca*/ad radices *Rosmarinus Tournefortii*/De Noe in dumetis prope Canastel/ad occid. urbis Oran, solo calcareo,/100 m./undique ochroleuca/ stigma ochroleucum, antherae albo-violacea 23-4[-1934]' (MPU003422-hb. Maire; Supporting information).

Another material important for this typification: idem (MPU261526-hb. Maire; P01035306-hb. Maire). These two aforementioned sheets were collected by Maire at the same time and place ['avec le type' (Maire 1935)], but these specimens show some violet colouration in the upper half of the corolla and they correspond, according Maire, to the typical form of this species.

It corresponds to a merely little pigmented form of this species ['Undique ochroleuca [whitish-yellow on all sides]' (Maire 1935)]. We prefer to treat this specimen as a lectotype because in Paris herbarium (P) there are frequently duplicates of a great part of Maire herbarium (Domina et al. 2013, p. 759).

This name is a synonym of *Boulardia latisquama* F.W.Schultz.

***Orobanche leucopogon* Boiss. & Hausskn. (Boissier 1879, p. 504 f.)**

Described from Turkey ['Hab. ad *Carduos* parasitica in monte Ssoffdagh Cataoniae 4000' (Haussk.!)'].

Lectotype (Uhlich and Rätzel, designated here): – '940./*Orobanche leucopogon* sp. n./In gramin[osis]. Soff Dagh./4000'./Color flor. *Orob*. *rubent*./in rad[ices] *Cardui*/28. 6. [18]65 Haussknecht' (G00769043 [G-BOIS]; Supporting information).

We have currently only found this single herbarium specimen that is suitable for typification. However, because herbarium material collected by Haussknecht is located in numerous herbaria (according to Stafleu and Cowan 1979, in 17 other herbaria), it is likely that further original material will be found. Therefore, lectotypification is necessary.

The variety *leucopogon* differs from var. *anatolica* in that the corolla lobes are very densely hairy on the edges and on its inner surface; in var. *anatolica*, the plant is ± articulately hairy there, but not densely hairy.

The name *O. leucopogon* Boiss. & Hausskn. is a synonym of the currently accepted name *O. colorata* subsp. *anatolica* (Boiss. & Reut.) Ó.Sánchez & Piwow.

***Orobanche major* f. *karelinii* Beck (Beck 1890, p. 171 ff. ['karelini']).**

According to Art. 56.1 Note 1 ICN (Turland et al. 2025, Art. 56), this name is still available for formal lectotypification, although the name of *O. major* L. was rejected.

Described from Central Asia (Kazakhstan and China) ['In Turkestania, Songaria. ... in faucibus Talki alt. 6–7000' (f. 3 leg. Regel Julio 1877), ad fl. Borgaty ad mt. Kasch 5–6000' (f. 3 Regel) ... Karelin et Kiriloff, Plantae exs. anni 1841 nr. 1802!']. The original material was collected in Kazakhstan by G. Karelin and I. Kirilov and in China (Xinjiang: Talqy River and Kax River) by A. Regel.

Lectotype (Uhlich and Rätzel, designated here): – **A)** '1802 *Orobanche alba* Steph./In apricis montium Alatau inter fl. Baskan/et Sarchan/leg. Karelin et Kiriloff a. 1841/Soc. Imp. Nat. Cur. Mosqu.' **B)** '*Orobanche major* L./ssp. *karelini* (G. Beck) ?/12 VII 1949/Det. Novopokrovsky' (MW0878178, Supporting information). – Isolectotypes: – LE01274186, LE01274187, LE01274189, LE01274194, LE01274197, NY05144804). – Other syntypes: – **A)** 'A. Regel. Iter Turkestanicum./Bach Borgaty an d[er]. W[est]. Seite des Kasch, 5–6000', 5/III [18]79'. **B)** '*O. major* L./f. *karelini*/ Beck' [manu Beck]. **C)** '*Orobanche major* L./var. *turkestanica* m[ihi]./2. IX. 1947 Determ. I. Novopokrovsky.' (LE s.n.). – **A)** 'A. Regel. Iter Turkestanicum 1877 VII/*Orobanche alba* Steph./ Talkischlucht/*O. major* L. vide Beck 1930, p. 249, I. Novop.' [manu Novopokrovsky]. **B)** '*Orobanche major* L./2. IX. 1947 Determ. I. Novopokrovsky' (LE01274192, LE01323168).

The specimen selected as a lectotype is in exceptionally good condition.

According to Beck (1930, p. 249 f.), the form *karelinii* differs from typical *Orobanche elatior* Sutt. by having undivided calyx segments. The presence of undivided calyx segments is

widespread in the genus *Orobanche* and therefore it is not a reliable distinguishing feature.

Furthermore, we were able to determine from the original material that the plants classified as the form *karelinii* have the characteristics of *O. centaurina* Bertol., Fl. Ital. 6: 430 (1846), which is also more widespread to the east. We therefore place the name in the synonymy of *O. centaurina*.

Orobanche nicotianae Wight (Wight 1850, p. 178 f., t. 158)

Described from south India ['The plant selected to illustrate the order is extensively distributed in Southern India, in those districts where Tobacco is largely cultivated, and is a most abundant and injurious weed. In Coimbatore it is in full perfection in March and April, when the Tobacco crops are approaching maturity. It is, I believe, the only true Indian *Orobanche*, all other species, referable to the order, belonging to other genera'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Coimbatore January/1848'. **B)** 'Peninsula Indiae Orientalis/No./2408 *Orobanche*/Herb. Wight./Distributed at the Royal Gardens, Kew. 1866–7.' **C)** '*Orobanche cernua* Loefl. var. *desertorum* Beck/Flora of Madras/Det. J. S. Gamble/1922' (K000061384; Supporting information). – Isolectotype: (L2816559). – Other syntype: – **A)** 'R[obert]. W[ight]./*Orobanche* s[pec]. n[ov]./*nicotianae*/Coimbatore January 1848'. **B)** 'Bombay Herbarium of the late N. A. Dalzell/Presented by Mrs. Dalzell, April 1878'. **C)** '*Orobanche cernua*, Loefl./var. *desertorum*, Beck/Flora of Madras/Det. J. S. Gamble/1922'. **D)** 'See the interesting account of it/ growth on Tobacco in Wight Spic. Neilgh.!/J. S. G[amble].' (K000061383). Two herbarium specimens in Edinburgh (E00179770, E00179771) could also represent syntypes.

The name *Orobanche nicotianae* Wight belongs to the synonymy of *O. cernua* var. *desertorum* Beck.

Orobanche ozanonis F.W.Schultz ex Beck (Beck 1890, p. 249)

Schultz (1866, p. 358) mentioned the name as early as 1866 without providing a diagnosis, whereas the first validating description was given by Beck (Beck 1890, p. 249). Described from France ['Gallia: In saxosis de Portes prope Lagrave (Dep. Hautes Alpes), leg. Ozanon!'].

Lectotype (**Uhlich and Rätzel, designated here**): – 'F. Schultz, herbarium normale. Cent. 10./924, *Orobanche ozanonis* F. Schultz./10 juillet 1859./Sur l'*Artemisia camphorata* dans les détritus des rochers/schisteux de Portes, à 2000 m., près Lagrave (Hautes-/Alpes)./Déc. et rev. Ch. Ozanon.' (P04394315, Supporting information). – Isolectotypes: (LE01323164, K000759347, P04419133, B_10_0294595, JE00015472, WU077716, M0185501, MPU021199, AMD84172). – Other syntype: – '*Orobanche artemisiae* Vaucher/*loricata* Rch./Sur l'*artemisia camphorata* Vill. ! dans/ les dètritus schisteux de La Grave/(h[autes] alpes) alt. 2200 m/Juillet 1859 Herbier Ozanon.' (P04419460).

We choose the herbarium specimen P04394315 because it contains plants in the best condition. The name *Orobanche ozanonis* F.W.Schultz ex Beck belongs to the synonymy of *O. serbica* Beck & Petrovič.

Orobanche pancicii Beck (Beck 1887, p. 148, t. 7 = Fl. v. Südbosnien t. 6)

Described from Bosnia and Herzegovina ['Crescit ad radices *Scabiosae leucophyllae*! et *Ligustri vulgaris*! frequenter circa Sarajevo et prope Pazarić, Tarćin, ad pedem montis Treskavica. Ad pedem montis Maglić, in valle fluminis Sutjeska. Prope Mrzdanov in monte Zverda Serb. merid. occident. et in monte Rtanj Serb. orient. (Pančić) (Exsicc. Nr. 7)'].

Lectotype (**Mráz, Uhlich and Rätzel, designated here**): – 'Dr. G. Beck: Plantae Bosniae et Hercegovinae/exsiccatae Nr./*Orobanche pančićii*/Bosn.: auf dem Mojmilo [43.835394 N 18.358841E] bei Sarajevo/VI/1885 leg. Dr. G. Beck' [scripsit Beck] (two sheets: PRC456185, PRC456186, sheet one Fig 9). – Isolectotypes: PRC456189, PRC456188). – Other syntypes: – 'Dr. G. Beck: Plantae Bosniae et Hercegovinae/ exsiccatae Nr. 7/*Orobanche pančićii*/ad radic[es]. *Scabiosae leucophyllae*/Bosn[ia]. In montosis circa Sarajevo/VI/1885 leg. Dr. G. Beck' (PRC456187, LE01323161, LE01323162, P04385003, P04405636, P04243414, LY0738370, LY0738371, WU0072559, WU0070733, LECB0001143, B s.n., S11-4324 and KFTA0001921, the last not seen).

The specimen selected as the lectotype is in good condition; the attachment to the host is present.

Orobanche pancicii Beck is a currently accepted name.

Orobanche pancicii f. *kerochroa* (Beck 1887, p. 148)

Beck (1887) does not mention a classical location for this form ('Cum typo.'). Later, Beck (1890, p. 224; Beck 1930, p. 163) mentions the form from eastern Bosnia ['circa Sarajevo (1–3) [3 = f. *kerochroa*]'] and Hercegovina ['... im Neretva-Tal zwischen Raska gora und Vojno ... hier auch f. 5 [= f. *kerochroa*]'].

Lectotype (**Mráz, Uhlich and Rätzel, designated here**): – 'Dr. G. Beck: Plantae Bosniae et Hercegovinae/exsiccatae Nr./*Orobanche pančićii*/f. *O. kerochroa*/Bosn.: auf dem Mojmilo bei Sarajevo/VI/1885 leg. Dr. G. Beck' [scripsit Beck] (PRC456190, Supporting information).

We accept the name for a waxy yellow or sulphur yellow color form of *O. pancicii*.

Orobanche peisonis Beck (Halácsy and Braun 1882, p. 121)

The species receives its name from Lacus Peiso [Neusiedlersee/ Lake Neusiedl/Fertő tó, Austria/Hungary]

Lectotype (Sánchez-Pedraja and Piwowarczyk, designated here): – '*Orobanche coerulea* L./auf .../antheras glabrae: *caesia*?/auf Bergen beim Neusiedler See [lacum Peisonem]' (W0195924, the right plant; Supporting information; mounted with the lectotype of *O. caesia* Rchb.).

As we can read in the description of Beck (1882) he used more material and when he described this species he divided it into two varieties, based on the fact that the calyx was gamosepalous (var. *monosepala*) or more or less divided

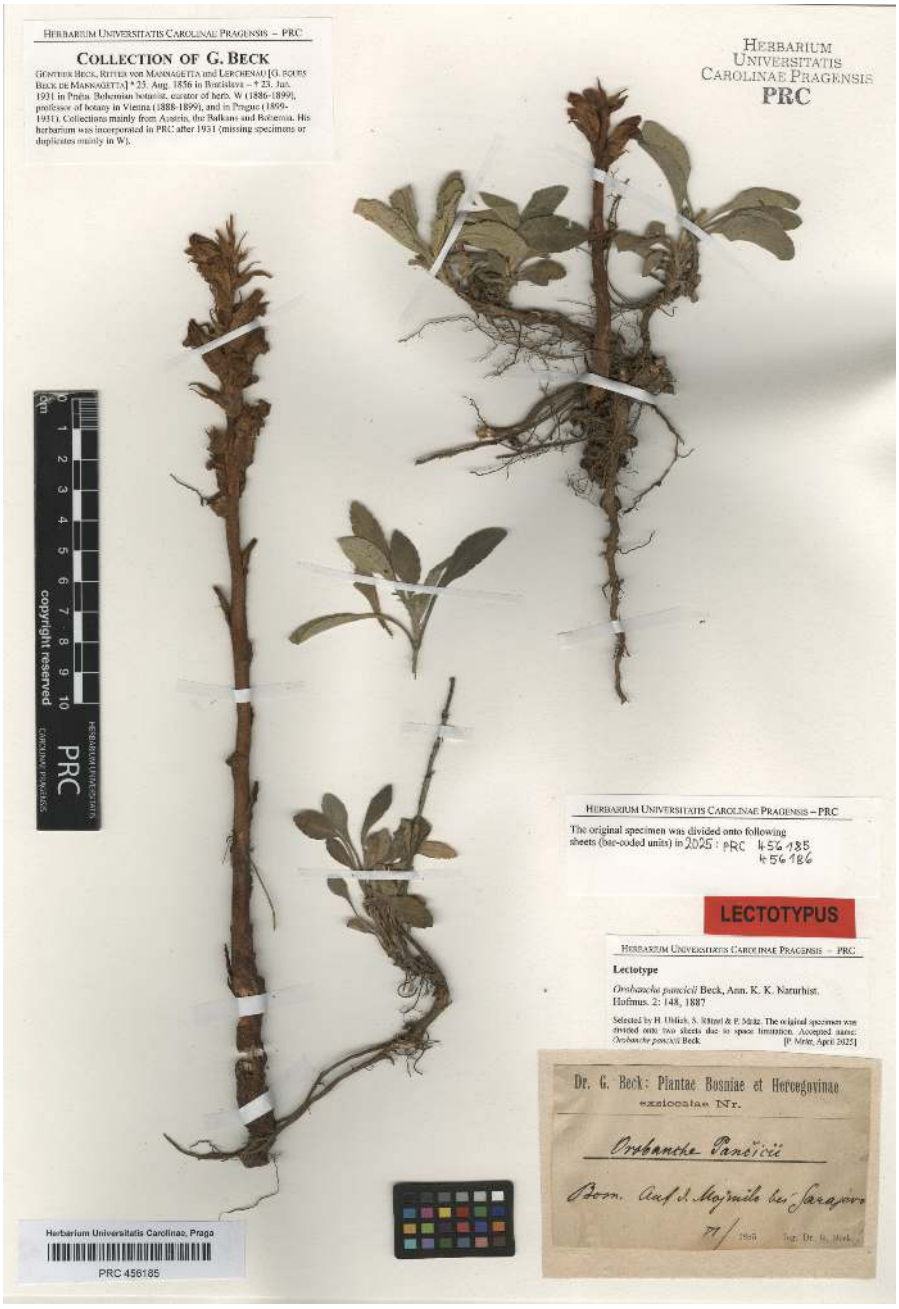


Figure 9. Lectotype of *Orobanche pancicii* Beck (PRC456185, the first of two sheets, designated here). Courtesy of the Herbarium of the Charles University Prague.

(var. *homoiosproleon*). Later Beck himself included his var. *monosepala* within *O. caesia* [var. *typica*] f. *peisonis* and his var. *homoiosproleon* into *O. caesia* [var. *typica*] f. *homoiosproleon* (Beck 1890, p. 121–122; Beck 1930, p. 99), further both var./f. were described from the same place ('lacum Peisonem'). We believe that both varieties/forms refer to the same taxon, and we prefer to choose this single specimen as the nomenclatural type among all the original material mentioned by him in his protologue. Moreover, the specimen fits perfectly to the traditionally used interpretation.

According to the general opinion, and our idea, this taxon is synonymous to *Phelipanche caesia*, notwithstanding being described from the westernmost region of its distribution range. Of course, the mention of Madonie, Sicily (Gussone 1844, p. 138) is erroneous (Rätzel et al. 2018, p. 209 f.); in addition, we can say that the combination indicated in POWO [*Phelypaea caesia* (Rchb.) Guss. (1844)] was never made by Gussone.

The name *Orobanche peisonis* Beck belongs to the synonymy of *Phelipanche caesia* (Rchb.) Soják.

***Orobanche pogonanthera* Reut. (Reuter 1847, p. 33)**
Described from Iran ['In Persia australi (Kotschy!) pl. pers. austr. exsicc. n. 949 ... (v. s. in h. Boiss.)'].

Holotype: – **A)** 'Kotschy Pl. Pers. austr./949./*Orobanche pogonanthera*/Reut.' **B)** '*Orobanche pogonanthera* Reut./ in DC. prod.' **C)** 'holo-Typus'. (G00150213 [G-BOIS]; Supporting information). – Isotype: (P02968175, left plant).

We have currently only found these herbarium specimens suitable for typification. However, because herbarium material collected by Kotschy is present in several herbaria (according to Stafleu and Cowan 1979, e.g. in W and BP), it is likely that further original material (isotypes) will be found.

The name *Orobanche pogonanthera* Reut. belongs to the synonymy of *O. cernua* var. *desertorum* Beck.

***Orobanche pubescens* D'Urv. (Dumont D'Urville 1822, p. 76)**
Described from Greece ['Vulgaris in collibus siccis insulae Meli. Aprili floret'].

Lectotype (Uhlich and Rätzel, designated here): – *'Orobanche*/Melos Mr. D'Urville/1821' (G00675584, Fig 10).

The whereabouts of a possibly separate herbarium belonging to the widely traveled Dumont d'Urville are unknown (cf. Stafleu and Cowan 1976). Individual herbarium specimens can be found in G and P. It cannot be ruled out that further original material will be discovered. Therefore, a lectotypification is necessary.

The plant representing the type of *O. pubescens* is located at the top right and was mounted on the sheet with two other collections (top left: *Orobanche vulgaris*, Constantinoble, *M. Louis Castagne* 1822, G00675586, and in the middle: *Orobanche crenata*, Egipte, *Coquebert* [de Montbret]; G00675585).

Orobanche pubescens D'Urv. is a currently accepted name.

***Orobanche scabiosae* W.D.J.Koch (Koch 1833, p. 440)**
Described from Germany and Austria ['Die *Orobanche scabiosae* wurde von Berger bei Berchtesgaden auf *Scabiosa columbaria* entdeckt. v. Spitzel fand sie auf der Mitterkaseralpe bei Lofer 5500' hoch'].

Lectotype (**Fleischmann, Uhlich and Rätzel, designated here**): – **A)** 'Herbarium Regium Monacense./*Orobanche scabiosae* Koch/! B. [manu Beck?]/August/in *Scabiosa silvatica*/ Roßhütte/am Untersberg/Berger'. **B)** 'Herbar: *Orobanche reticulata*/Sammler: F. X. Berger Fundort: Roßhütte/am Untersberg [MTB 8343/2-N,/Berchtesgadener Alpen Bayern/Salzburg]/annot. F. Schuhwerk (M) November 2012' (M-0244217, Supporting information). – Isolectotypes: – **A)** 'Herbarium Regium Monacense./*Orobanche scabiosae* Koch/! B. [manu Beck?]/August/Roßbrunn/am Untersberg/ Berger'. **B)** 'Herbar: *Orobanche reticulata*/Sammler: F. X. Berger Fundort: Roß?/-brunn am Untersberg [MTB 8343/2-N,/Berchtesgadener Alpen Bayern/Salzburg]/ annot. F. Schuhwerk (M) November 2012' (M s.n.). – **A)** 'Herbarium Regium Monacense./*Orobanche scabiosae* Koch/! B. [manu Beck?]/Untersberg. Berger.' **B)** 'Herbar: *Orobanche reticulata*/Sammler: F. X. Berger Fundort:/am Untersberg [MTB 8343/2-N,/Berchtesgadener Alpen Bayern/Salzburg]/ annot. F. Schuhwerk (M) November 2012' (M-0244216). – Further specimen from the type location: – **A)** 'Herbarium Regium Monacense./*Orobanche scabiosae* Koch/! B. [manu Beck?]/auf *Scabiosa*/*sylvatica*/am Untersberge/August/Herb. Zuccarinii/Herbar Univ. Ludov. Maximil.' **B)** 'Herbar: *Orobanche reticulata*/Sammler: J. Zuccarinii Fundort: auf *Scabiosa* [*Knautia*]/*sylvatica* am Untersberg August [MTB 8343/2-N,/Berchtesgadener Alpen Bayern/Salzburg]/annot. F. Schuhwerk (M) November 2012' (M-0244215).

The lectotype contains on the left side *Knautia dipsacifolia* Kreutzer (syn.: *K. sylvatica* (L.) Duby; *Scabiosa sylvatica* L., nom. utique rej. prop.; M-0244218), which is evidently the host, because the tuber base or attachment point of the parasite is located on the roots of the host plant.

The name *Orobanche scabiosae* W.D.J.Koch belongs to the synonymy of *O. reticulata* var. *reticulata*.

***Orobanche serbica* Beck & Petrović (Petrović 1885, p. 146)**
Described from Southern Serbia [translated from Serbian: '... on the rocky slopes above Sićevo, next to Gramada and Pleš, and on [mt.] Visa above the monastery Sv. Bogoroditse'].

Lectotype (Lazzeri, Mráz and Descombes, designated here): – **A)** 'Herbar. Beck./*Orobanche serbica* Petrov. [manu Beck]/auf *Artemisia camphorata*/Serbien/l[e]g. Dr. Petrović.' **B)** 'Herbarium Universitatis Carolinae Pragensis –/PRC/ Lectotype of/*Orobanche serbica* Beck & Petrović, Fl. Agr./ Nyss., Add.: 146, 1885/Accepted name: *O. serbica*, Lectotype selected by Lazzeri V. & P./Mráz [P. Mráz, September 2022]' (PRC456083, Fig. 11; www.jacq.org/detail.php?ID=1895646; Rainer et al. 2023).

The label on the specimen of *O. serbica* preserved at PRC (PRC456083) was written by Beck who also determined the taxon. Although the label lacks any precise indication of the location and the date of collection, the specimen comes from Serbia; it was collected by Petrović and the plant grew on *Artemisia camphorata* (= *Artemisia alba* Turra) as obvious from the herbarium sheet where the host plant and its parasite are still interconnected (Fig. 11). Morphologically, the specimen of *O. serbica* perfectly fits its protologue (Petrović 1885, p. 146). Therefore, all these elements clearly suggest that the specimen represents an original material of the name *O. serbica*. Because our search in other herbaria where other original material could also be preserved, i.e. W in respect of Beck's collection, and BEOU and BEO in respect of Petrović's collections, was unsuccessful (see also Carlón et al. 2008, p. 115 f.), we select PRC456083 as a lectotype of *O. serbica*. Regarding the host species, at the time of the description of *O. serbica*, *A. camphorata* Vill. was the name in current usage (Beck 1890).

Concerning the distributional range of *O. serbica*, the species has been reported also under the name *O. ozanonis*, from Bulgaria, Serbia, North Macedonia, France and Spain (Beck 1890, Beck 1930, Tison and Foucault 2014,



Figure 10. Lectotype of *Orobanche pubescens* D'Urv. (G00675584, designated here). Courtesy of Conservatoire et Jardin botaniques de Genève.

Sánchez-Pedraja et al. 2016). Recently, its presence in Italy was reported for the first time based on photos of plants observed in the province of Parma (Sánchez-Pedraja et al. 2020, p. 464) and in Piemonte (Bellone et al. 2023, p. 26). *Orobanche serbica* has previously been placed in the subsect. *Glandulosae* Novopokr. [= 'Tribus' or 'Grex' *Glandulosae* Beck (Beck 1890, p. 214 f.; Beck 1930, p. 164 f.; Király et al. 2005, p. 18; Stoyanov 2020, p. 14)]. However, mainly due to the constant lack of glandular hairs with purple base, at least on the outside of corolla, and the noteworthy resemblance to other taxa belonging to the controversial subsect. *Minores* Teryokhin (= 'Tribus' or 'Grex' *Minores* Beck), in the absence of conclusive evidence, it seems preferable not to include *O. serbica* in *Glandulosae*. In our opinion, *O. serbica* shows a rather remarkable morphological resemblance with *O. artemisiae-campestris* Gaudin and these similarities can be referred also to *O. picridis* F.W.Schultz. Moreover, a certain similarity can also be pinpointed with specimens

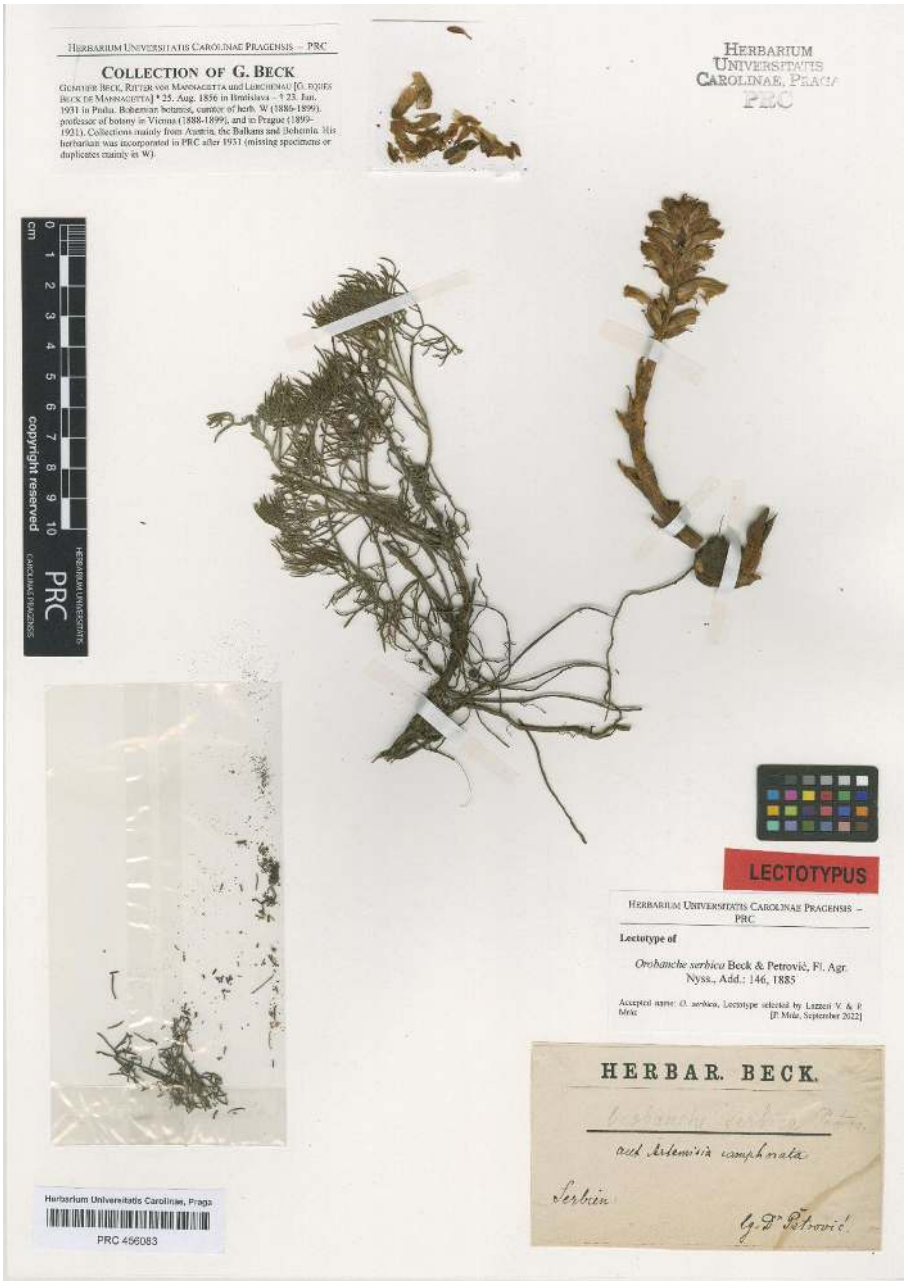


Figure 11. Lectotype of *Orobanche serbica* Beck & Petrović (PRC456083, designated here). Courtesy of the Herbarium of the Charles University Prague.

of *O. minor* Sm. bearing a yellow stigma. Nevertheless, the shape of the corolla and, in particular, its lips and the usually marked curvature, the bright yellow stigma and the indumentum on the stem, together with its host plant, allow to distinguish *O. serbica* from the aforementioned morphologically similar taxa.

Interestingly, a recent phylogenetic analysis placed *O. serbica* close to the taxa belonging to subsect. *Curvatae* Piwow., Ó.Sánchez & Moreno (= 'Tribus' or 'Grex' *Curvatae* Beck) and relatively distant from *O. artemisiae-campestris* as well as from other taxa of both subsections *Glandulosae* and *Minores* (Piwowarczyk et al. 2021), suggesting that apparent morphological similarity does not necessarily reflect a genetic affinity and indicating that *O. serbica* may not be placed in any of the two latter groups. When *O. serbica* is compared to species from the subsect. *Curvatae*, the corolla of the latter is broader, being inflated to campanulate and more markedly broadened from a relatively narrow basal part as well as, in most cases, more deeply coloured and even more considerably curved throughout.



Figure 12. Lectotype of *Orobanche solmsii* C.B.Clarke ex Hook. f. (K000195463, designated here). Courtesy of Royal Botanical Gardens Kew.

Orobanche serbica Beck & Petrović is a currently accepted name.

Orobanche solmsii **C.B.Clarke ex Hook.f. (Hooker 1884, p. 325)**

Described from the western Himalayas ['Western Himalaya; Kumaon at Tola, alt. 11 500 ft., Strach[ey]. & Winterb[ottom].; Kashmir and Kishtwar, alt. 8–11 000 ft., Falconer, & c.'].

Lectotype (**Uhlich and Rätzel, designated here**): – 'Himalayan Herbarium./R. Strachey and J. E. Winterbottom./ No. 3/*Orobanche*/Habitat. Tola Kumaon./Elevation above the Sea 11500 Feet' (K000195463, Fig. 12). Possibly the specimens of the collection *Falconer 804* (K00061385, L.2817693) also belong here and thus represent syntypes.

In our opinion, this plant, with its cylindrical and always dense inflorescences, pubescent hair covering of all parts, wide-tubular, ± unicoloured brown corollas in dry state and



Figure 13. Lectotype of *Orobanche spectabilis* Reut. (LE01323176). Courtesy of Komarov Botanical Institute of the Russian Academy of Sciences St. Petersburg.

the presumed parasitism on Apiaceae (cf. Zhang and Tzvelev 1998: 235: '*Heracleum*'), does not belong to the immediate relationship of *O. cernua* L., but represents an independent taxon.

Orobanche solmsii C.B.Clarke ex Hook.f. is a currently accepted name.

Orobanche spectabilis Reut. (Boiss. and Buhse 1860, p. 169)

Described from Persia, Prov. Yazd ['Im Jesder Gebirge in dem Thale Derreh-goum, auf *Artemisia* sp., 23 April 1849. N° 1348'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** 'Herb. Buhse, Riga/*Orobanche spectabilis*/Reut./Fl. or. IV, 514/Tab. ined. LXVI, B/№ 1348/Im Geb[irge] von Yesd in dem Thal Der-/reh-goum, auf *Artemisia* sp./23. April 1849'. **B)** '1348. *O. ammophilae* aff./*O. spectabilis*/Reut. n. sp./R[euter]' [manu Reuter] (LE01323176!; Fig 13).

The currently accepted name is *O. kotschyi* var. *spectabilis* (Reut.) Beck.

Orobanche stocksii Boiss. (Boissier 1879, p. 505)

Described from Pakistan ['Hab. in *Eryngii* sp. parasitica ad Douboud [Doobund, Doband] Affghaniae (Stocks!)'].



Figure 14. Lectotype of *Orobanche stocksii* Boiss. (G00769060, designated here). Courtesy of Conservatoire et Jardin botaniques de Genève.

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** '955 *Orobanche*/sp. nov./Doobund/E. Stocks 1851'. **B)** 'Beloutchistan E. Stocks 1851'. **C)** '*Orobanche stocksii* Boiss.' (G00769060 [G-BOIS]; Fig. 14; isolectotypes K000061358, K000061361, K000061362).

We chose the specimen from G because it is the best preserved material.

Orobanche stocksii is a species with large and wide-tubular flowers that is related to *O. cistanchoides* Beck and *O. sintenisii* Beck. These species are relatively rare and therefore are little known. According to Schiman-Czeika (1964, p. 16) and Jafri (1976, p. 20), but in contrast to Gilli (1979, p. 281), *O. stocksii* is identical with *O. cistanchoides*. According to Jafri (1976, p. 20), *O. stocksii* differs from *O. kotschyi* Reut. in the absence of a constriction at the insertion point of the stamens and in the absence of an inflation of the corolla below the middle of the corolla-tube, in shorter bracts and the calyx c. 1/3 of the corolla, and in the calyx teeth not so deeply incised.

Orobanche stocksii Boiss. is a currently accepted name.

Orobanche tatarica Link ex Beck (Beck 1890, p. 122), nom. inval., pro syn.

The species receives its designation from Tataria/Tatary ['In Linnaeus's time, Central Asia and European Russia east of the river Don' (Stearn 1992, p. 223)], and it was added by Beck (1890) to the synonymy of *Orobanche caesia* var. *borealis* f. *borealis* (Turcz.) Beck.

Authentic material (cited by **Sánchez-Pedraja and Piwowarczyk)**, upon which this designation was based: – **A)** 1. '*Or. tatarica* 1'. **B)** 'per majore *O. coerulescens* nun. simplicia *O. ramosa*'. **C)** '*O. coerulescens* v[ar]. *polyclomos* Wallr.' **D)** '*O. borealis* Turczan[inow]./Beck' [manu Beck] (B –W 11599 –01 0; Supporting information). – **A)** '*Orobanche tatarica*/Fischer/e desertus Tataria [Tatary]/W. [Willdenow] det. [leg. Fischer]' **B)** '..../ex herb. Willdenow; see specimen B–W11599/...' **C)** 'Verified by H. Uhlich, 21.01.2001' (HAL0090576).

The Willdenow folder B –W 11599 contains two herbarium sheets; the other specimen B –W 11599 –02 0 is formed by two specimens of *Phelipanche ramosa.* We choose from Willdenow's folder as herbarium material of the discussed name the specimen B –W 11599 –01 0 that contains three specimens (two of the specimens attached by the base) of a single gathering. In addition, as can be seen in one of the labels that the material was reviewed by Beck. A duplicate of this original material is located in Martin-Luther-Universität (see above).

Beck, the monographer of this family, brought this designation to the synonymy of *O. borealis* Turcz. (Beck 1890, p. 123)] and, in addition, indicated the place where he saw the specimen (B-W [Herbarium Willdenow, 'in Herb. Willd. p. pte.!']. It's good to remember that after Willdenow's death, J.H.F. Link, author of the designation, became curator of the herbarium and director of the Botanical Garden (Hortus Regius Berolinensis) in Berlin.

In the same monograph, Beck placed the taxon under *O. caesia* as *O. caesia* var. *borealis* (Turcz.) Beck [sic] and *O. caesia* f. *borealis* (Turcz.) Beck [sic], but he indicated its basionym, as was frequent at that time, erroneously (Piwowarczyk et al. 2019, p. 26). We note that the correct one is *O. borealis* Turcz. ex Kar. & Kir. [in Bull. Soc. Imp. Naturalistes Moscou 14: 722 (1841)]; nevertheless, the combination was validly published through indirect reference (Turland et al. 2025, Art. 41.3 and 38.15). Later, Uhlich (2015, p. 83) made the same mistake when he made his new combination, but he himself (Uhlich 2017, p. 79) corrected it a short time later.

According our most synthetic opinion, *Phelipanche caesia* (Rchb.) Soják should be the accepted name.

Orobanche versicolor F.W.Schultz (Schultz 1843, p. 129)

Described from Greece ['In *Chrysanthemo coronopifolio* ad Naupliam legit Clarissim. Spruner et prope Corynthum Cl. Fraas'].

Lectotype (**Uhlich and Rätzel, designated here**): – **A)** '*Orobanche cruenta* Sprunner [sic]/*O. sprunneri* [sic] C. H. Sch[ultz]. Bip[ontinus]. am/15 März 1842/Auf *Chrysanthemum coronarium*/bei Nauplion häufig./Sprunner [sic]'. **B)** '*Orobanche versicolor*/Sepalis bi- et obsolete plurinervis, e basi ovata anguste subulatis, inaequaliter bifidis/tubum corollae superantibus, corolla campanulato-tubulosa/a medio tubi sensim ampliata, fauce amplissima, dorso recta, labiis denticulatis/superiori integro, staminibus infra mediam tubi/insertis, a basi ultra medium lanuginoso-pilosis/stigmatis disco laevi./*O. cruenta* Sprunner [sic] nec Bertoloni/habitus *O. cruentae*./Auf *Chrysanthemum coronarium* bei Nauplion.' **C)** 'Ich hatte sie erst nach einem/(illeg.) jedoch mit der Mutterpflanze/zusammengehörenden 1834 von J[ean-Marie]. L[éon]./Dufour chirurgien sousaide [= assistant surgeon] aus Algier/erhaltenem Exempl. *Orobanche chrysanthemi*/genannt. Friedrich Schultz in Bitche'. **D)** '*Orobanche pubescens* d'Urv./1998 rev. W. Gutermann (Wien)'. **E)** 'Botanisches Institut der Universität Wien/Herbarium (WU)/[Syn-] Typus von/*Orobanche versicolor*/F.W.Schultz in Flora 26: 129 (1843)/Handschriftlicher Entwurf der (!Original-)/Diagnose von F. W. Schultz/1998 W. Gutermann (Wien)/Lectotypus-Kandidat!!' (WU077706, Supporting information).

We have currently found only this herbarium specimen suitable for typification. However, because herbarium material collected by Fraas is located also in other herbaria (according to Stafleu and Cowan 1979, e.g. in M), it is likely that further original material will be found. Therefore, lectotypification is necessary. The specimen is in excellent condition.

The name belongs to the synonymy of the older name *O. pubescens* d'Urv.

Phelipanche atlantica Pomel (Pomel 1874, p. 103)

The species was described from Algeria ['Sur *Artemisia campestris*: Mou-el-Gtouta (au S. de Tiaret, Tiaret Province, Hauts plateaux Oranais, formerly part of the Oran French department)'].

Lectotype (designated by Domina 2013, p. 7, and cited here by **Sánchez-Pedraja and Piwowarczyk**): – **A)** '*Parabanche caerulea*/var. *atlantica*/itima 25 mai 60 [manu Pomel]'. **B)** '... *Orobanche laevis*/= *Phelipanche atlantica* Pomel! (Type!)/O[ran]. Itima, Mou-el-Gtouta/24-5-1860 leg. A. Pomel [manu Maire]' (MPU008101-herb. Pomel[-herb. Maire]; Supporting information). — Other material of interest, in this typification, referable to this species: – 'Université d'Alger/Herbier de l'Afrique du Nord/*purpurea* (Jacq.) Asch./M. Grand Atlas, Ourika [Ourika Valley, High Atlas/Haut Atlas, Al Haouz Province, Morocco]: pâturages/sur les gres au dessus d' Anfegeïn [Asguine], lieux/humides, 2100–2200 m 9-7-1921/Corolle bleue/stigma blanchâtre Dr. R. Maire' (P04363437-hb. Maire).

In our opinion, this name is a synonym of the North African taxon *Orobanche purpurea* var. *ballii*, which was described from Marocco by Maire (1930). It is scarce and endemic to Northwest Africa, and its distribution range extends through Algeria and Morocco (Sánchez Pedraja et al. 2016+).

It should be noted that at the species rank *P. atlantica* Pomel has priority over *P. ballii* (Maire) Domina (see, Domina 2017, p. 93). In addition, we want to point out that it has frequently been confused with other *Phelipanche,* species such as *P. arenaria* and *P. lavandulacea*.

Phelipanche purpurea subsp. *ballii* (Maire) Carlón, G. Gómez, M. Laínz, Moreno Mor., Ó. Sánchez & Schneew. is the currently accepted name.



Figure 15. Original specimen of *Phelipaea gigantea* Kar. (LE01280008). Courtesy of Komarov Botanical Institute of the Russian Academy of Sciences St. Petersburg.

***Phelypaea gigantea* Kar. (Karelin 1839, p. 165), nom. nud., nom. inval. [Turland et al. 2025, Art. 38.1.]**

Mentioned from Turkmenistan [‘In insula Ogurtschinsk’].

Authentic material, related to this invalid name (cited by **Uhlich and Rätzel**): – **A)** ‘300./o(стро)в Огурчинский [Ogurja Ada]/май 1836’ [manu Karelin?]. **B)** ‘*Phelypaea gigantea* Kar[elin]/Insula Ogurtschinsk.’ [manu ?] **C)** ‘*Phelipaea violacea*/Desf.?/Corollis longioribus, tubo/angustiflora cylindraceo/ad faucem constricto,/fauca ampliata differre/videtur./A *P*[*helypaea*]. flava digoscitur/foliis floralibus multo/…’ [continued on the invisible back of the label]. **D)** ‘*Cistanche tubulosa* (Schenk)/R. Wight/10. IV 1948 Determ. I. Novopokrovsky’ (LE01280008, Fig. 15).

In the literature (cf., among others, Ledebour 1849, p. 314, Beck 1930, p. 33, 36), this name was partly attributed to *C. flava* (C.A.Mey.) Korsh. (syn.: *C. tubulosa* var. *flava* (C.A. Mey.) Beck) and partly to *C. salsa* (C.A.Mey.) Beck.

After studying the material, this invalid name actually belongs to the synonymy of *C. tubulosa* (Schenk) Wight ex Hook.f., as Novopokrovsky (in sched.) already stated in 1948.

***Phelypaea melongenae* F.W.Noë ex Beck (Beck 1890, p. 101), nom. inval. [Turland et al. 2025, Art. 38.1.]**
This is a herbarium name that Beck (1890: '*Phelipaea Melongenae* Noë, in schedis nr. 1118 et 1172, vidi orig.') listed in the synonymy of *Phelipanche aegyptiaca* (Pers.) Pomel.

Authentic material (cited by **Uhlich and Rätzel**), related to this invalid designation: — 'Herbarium Noëanum/No. 1118: *Philipaea* [sic] *melongenae* mihi/Bagdad S[e]pt[em]b[e]r. 1851 ego!/nova species!' (K000061350, Supporting information; P02982851, CAS0026603, L2814870, G7832/56 [here the collection year is given as 1849!], G00769115 [G-BOIS]).

The name *Phelypaea melongenae* belongs to the synonymy of *Phelipanche aegyptiaca* (Pers.) Pomel.

Taxonomic notes

Sánchez-Pedraja and Piwowarczyk: *Orobanche colorata* subsp. *anatolica* (Boiss. & Reut.) Ó.Sánchez & Piwow., comb. et stat. nov.
The species *Orobanche colorata* was described from Armenia [Georgiam Armeniamque/Georgia-Imeretia Governorate] by Koch (1843) as a result of his botanical explorations in the Caucasus region. Four years later Reuter (1847) published, in his monograph of this family, *O. anatolica*, in which he included all the material that he believed to belong to only one taxon. Years later, Piwowarczyk et al. (2019, p. 95) typified both names [*O. colorata*, Neotype cf. Fig. 16, and *O. anatolica*, Lectotype cf. Fig. 17] and this maintains the traditional use.

The two taxa combined here have been considered different by a large number of authors [e.g. Euro+Med Plantbase and Plants of the World Online (POWO)] based on mophological characters and distribution range (Novopokrovsky and Tzvelev 1958), and genetic evidence (Carlón et al. 2008). Thus, the indumentum is the most used in the keys: e.g. the specimens from close to Caucasus and its surroundings are usually more glabrous with ± red-orange habit (see, e.g. LE01188585), while the specimens collected farthest from this mountain range, but within the distribution range of the species, are more or much more covered with ± woolly-whitish indumentum (see, e.g. G00383273). However, these differences are not always as clear as we can see at the ends of their distribution area (Caucasus to western Anatolia or Iran-Iraq), and, for this reason, we prefer to treat these taxa as subspecies of a single species.

Nomenclatural novelty: *Orobanche colorata* subsp. *anatolica* (Boiss. & Reut.) Ó.Sánchez & Piwow., **comb. et stat. nov.** Basionym: *Orobanche anatolica* Boiss. & Reut. in Candolle, Prodr. 11: 17 (1847).

Sánchez-Pedraja and Piwowarczyk: *Orobanche santolinae* subsp. *apuana* (Domina & Soldano) Ó. Sánchez & Piwow., comb. et stat. nov.
In our opinion, the species described from Tuscany (Italy) by Domina and Soldano (2015, p. 164) is, probably, a narrowly endemic taxon, that fits better into *O. santolinae*.

Holotype: – Italy. Apuan Alps, Via Vandelli (Massa [Massa and Carrara, Tuscany/Toscana]), 44°05′48″N, 10°13′09″E, 920 m a.s.l., dry pastures on carbonate lithosol, on *Santolina pinnata* Viv. [= *S. leucantha* Bertol. (*S. chamaecyparissus* aggr.)], 13 July 2014, A. Soldano 16532 (holotype PAL). – Isotypes: FI! [FI 007303], Herb. Soldano!). – Paratype: Italy. Via Vandelli (Massa [Massa and Carrara, Tuscany/Toscana]), 44°05′48″N, 10°13′09″E, 920 m a.s.l., on *Santolina pinnata* Viv., July 1996, A. Soldano (herb. Soldano!).

Orobanche santolinae Loscos & J.Pardo (Loscos and Pardo 1863, p. 79; Sánchez Pedraja et al. 2016+) is a relatively frequent species from the west Mediterranean region (Balearic Islands, Corsica [*O. cyrnea*], France, Italy [*O. apuana*], Morocco? and Spain), with some morphological variability. The subspecies *apuana* shows some characters which are diagnostic in comparison to the typical subspecies, such as a different host (*Santolina pinnata* Viv.), size (usually less robust, up to 30 cm), color (whitish specimens with yellow stigma) and indumentum (relatively copious).

Nomenclatural novelty: *Orobanche santolinae* subsp. *apuana* (Domina & Soldano) Ó.Sánchez & Piwow., **comb. et stat. nov.** Basionym: *Orobanche apuana* Domina & Soldano in Phytotaxa 207: 164 (2015).

Sánchez-Pedraja and Piwowarczyk: *Orobanche santolinae* subsp. *cyrnea* (Jeanm., Habashi & Manen) Ó.Sánchez & Piwow., comb. et stat. nov.
In our opinion, the species described from Corsica (France) by Jeanmonod et al. (2005, p. 257) is a narrowly endemic taxon, which fits better into *O. santolinae*.

Holotype: – 'Secteur Rotondu, au NW de Santa-Lucia-di-Mercurio [Haute-Corse (2B), Corsica Island, France] sur la D41 [42º20'N, 9º13'E, fruticée base rocailleuse, assez abondant, sur *Santolina corsica* [*S. chamaecyparissus* aggr.], 810 m, 25.5.2000, D. Jeanmonod, A. Schlüssel & C. Habashi J6439 (G00000759), exemplaire de gauche!'.

The Corsican taxon shows some diagnostic characters distinguishing it from *O. santolinae*, e.g. a different host (*Santolina corsica* Jord. & Fourr.), usually less robust habit (20–40 cm), color (bluish to violet specimens with whitish-yellow stigma) and copious indumentum. The more or less bluish color like in the Corsican plant can also be observed in specimens of *O. santolinae* from mainland France (Tison et al. 2014, p. 1955, photo 2), and the stigma colour is also variable in this species.

Nomenclatural novelty: *Orobanche santolinae* subsp. *cyrnea* (Jeanm., Habashi & Manen) Ó.Sánchez & Piwow., **comb. et stat. nov.** Basionym: *Orobanche cyrnea* Jeanm., Habashi & Manen in Candollea 60: 257 (2005).

Sánchez-Pedraja and Piwowarczyk: *Phelypaea tubulosa* Schenk (Schenk 1840, p. 23)
Described from Sinai (Egypt) by Schenk ['Hab. ad viam inter Suez et Tor [Sinai] in Arabia petraea, ubi legerunt Dr. Roth et Erdl mense Februario'].

Neotype (designated by Aldughayman et al. 2024, p. 15 f. 4, 16): – **A)** '… Wadi Rished (Helwan [Wadi Rished nr. Helwan

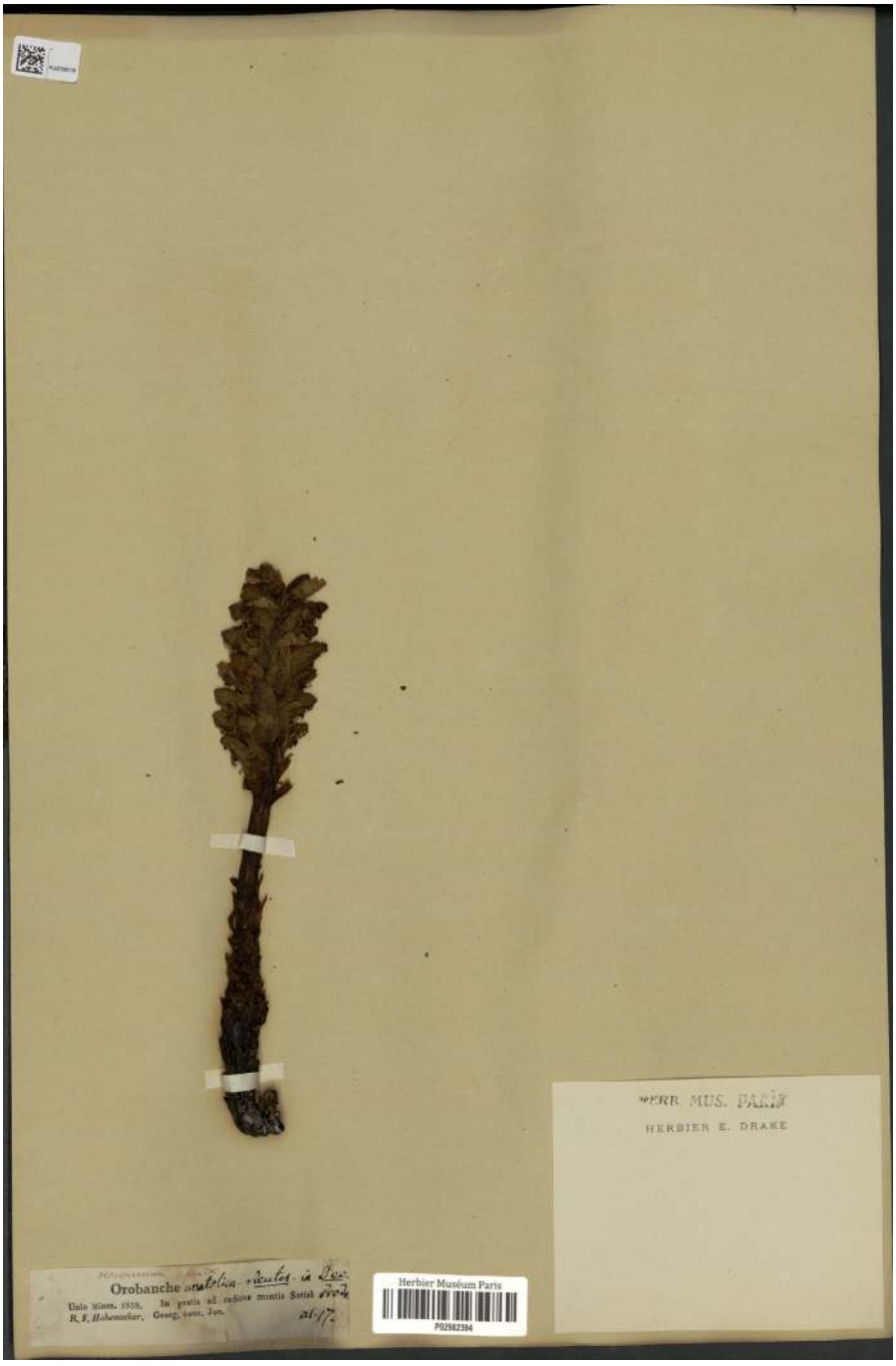


Figure 16. Neotype of *Orobanche colorata* K.Koch (P02982394, designated by Piwowarczyk et al. 2019, p. 95). Courtesy of Muséum national d'Histoire naturelle Paris.

(Davis 1955, p. 272), Cairo Governorate])/april'45/fl. purple. on *Atriplex halimus*/4.1945 H. Davis 10326'. **B)** '*C. tubulosa* (Schenk) Hook. f./Det. Adel Hadidy 1992' (K001222534).

Aldughayman et al. (2024) chose a very representative specimen as neotype, believing that it originated from Wadi Feiran, Sinai, Egypt. The Wadi Feiran effectively is in the Sinai Peninsula, but in the label of the sheet the collector had written 'Wadi Rished' that is near Helwan (Davis 1955, p. 272), Cairo Governorate rather than Sinai.

We consider that *Cistanche tinctoria* (Forssk.) Deflers [basionym *Orobanche tinctoria* Forssk. (1775)] has priority at the rank of species and is the correct name (Moreno Moral et al. 2018). When treated as different from the latter species, *Phelypaea tubulosa* Schenk, published in 1840 [1 Jun–1 Dec 1840?], can not be used, unless being conserved (Turland et al. 2025: Art. 8), because there are other synonyms from the same territory (Egypt [*Orobanche insignis* E.D.Clarke (1814)]) or from other regions [*Orobanche*



Figure 17. Lectotype of *Orobanche anatolica* Boiss. & Reut. ex Reut. (G00383282, designated by Piwowarczyk et al. 2019, p. 95). Courtesy of Conservatoire et Jardin botaniques de Genève.

calotropidis Edgew. (1840 [Jul 1840])], which seem to have priority.

Uhlich and Rätzel: additions and corrections to Uhlich and Rätzel in Nord. J. Bot. 6 (2024)

***Phelipaea flava* C.A.Mey.:** Unfortunately, in our contribution in Nord. J. Bot. 6 (2024), the lectotype of *Phelipaea flava* C.A.Mey. (Uhlich and Rätzel 2024, p. 22) was assigned to the wrong specimen (P02970920 instead of the correct LE01064312) in the Supporting information. We show here the correct specimen (LE01064312; Supporting information).

***Phelipanche purpurea* var. *hirsuta* (Beck) K.Stoyanov:** Unfortunately, in our contribution in Nord. J. Bot. 6 (2024), the newly proposed combination *Phelipanche purpurea* var. *hirsuta* (Beck) Uhlich & Rätzel is an isonym because the name has already been used by K. Stoyanov (2020, p. 41) at the same rank. The correct citation is therefore *Ph. purpurea*

var. *hirsuta* (Beck) K.Stoyanov, Obligat. paras. Orobanch. in Bulgaria: 41. 2020.

***Orobanche artemisiae-campestris* Vaucher ex Gaudin:** Of the lectotype of *Orobanche artemisiae-campestris* Vaucher ex Gaudin (G00392485), which consists of two sheets, we only illustrated one sheet in Uhlich and Rätzel (2024). The second sheet is illustrated in the Supporting information associated with this paper.

***Orobanche amoena* var. *regeliana* (Beck) Uhlich & Rätzel:** The lectotype of *Orobanche amoena* f. *regeliana* Beck has since been scanned with the barcode LE01273308 (https://en.herbariumle.ru/?t=occ&id=216330&rid=image_0363835 acc. 10.02.2025).

***Orobanche amoena* var. *dzejveri* (Beck) Uhlich & Rätzel:** The holotype of *Orobanche amoena* f. *dzejveri* Beck has been scanned with the barcode LE01273406 (https://en.herbariumle.ru/?t=occ&id=216428&rid=image_0363933 acc. 10.02.2025).

Uhlich and Rätzel: further corrections

***Orobanche oxyloba* f. *septemloba* Beck (Beck 1922, p. 34):** The original lectotypification by Piwowarczyk et al. (Piwowarczyk et al. 2023, p. 23) needs to be corrected. Beck (Beck 1922, p. 34) only mentioned 'Borjomi' as a classical locality. Piwowarczyk et al. (2023) interpreted the label of their chosen lectotype (LE01015370) as follows: 'Imereti, Daba (village near Borjomi, in Samtskhe-Javakheti prov.), at 2000 feet/26 June 1887'. In fact, the label contains the following information: 'Тифлизъ, г[ора]. Св[ятого]. Давыда на выс[оте]. 2000 ф./26. Июня 1887' [Tifliz, Mt. St. David, at 2000 feet/26 June 1887]. This site is located approximately 116 km E of Borjomi on the southwestern outskirts of Tbilisi.

Even if Beck (1922) used the entire material from the herbarium sheet for his diagnosis, it still consists of several collections from different locations and different years. It is unlikely that Beck (1922) located the Tbilisi collection – selected by Piwowarczyk et al. (2023) – in the Borjom area, because Tbilisi was already an important city and capital of the Georgian SSR in 1922. It is also unlikely that Beck (1922) based his diagnosis of '*scapus subsimplex*' on the second specimen from the right, because it is clearly evident that this is not a branching of the stem, but rather the left shoot is a plant from the previous year.

Therefore, the previous lectotype is superseded here and another specimen – which is in agreement with the protologue – must be selected as the **replacement lectotype** (**Uhlich and Rätzel, designated here**): – **A)** 'a. [manu Tzvelev] Боржомъ Тифл[исской] губ[ернии]., близъ кладбища/4. июня 1888 [И. Акинфиев]'. **B)** '*Orobanche septemloba* (G. Beck) Tzvelev/a – Typus/1955 I 10 Teste Tzvelev' **C)** 'a [manu Tzvelev] – Typus' (LE01015368, the two plants in the middle section on the left; Supporting information). – Other syntypes: (LE01015367, LE01015369). – Authentic specimen: (LE01015370, two right plants).

The clarification of the systematic position of the taxon remains subject to further investigation.

***Phelypaea bayernii* Novopokr. (Grossheim 1949, p. 730), nom. inval.** [Turland et al. 2025, Art. 39.1]: *Phelypaea bayernii* Novopokr., 1949, в Гроссг., Опред. раст. Кавк.: 730, nom. inval. (descr. ross.) was erroneously typified by Piwowarczyk et al. (2019, p. 15–16), because the name is invalid – based on the description written only in Russian (Turland et al. 2025: Art. 39.1). Besides, the sheet chosen as 'lectotype' contains another gathering, apparently different from was indicated. All this is here corrected.

We indicate as the **relevant original material** on which the designation is based: – **A)** 'Herbarium horti Petropolitani./*Anoplanthus biebersteinii* Reut. Pr/Inter Doralogiz et Ssuscha [Şuşa/Shusha/Shushi (Beck 1930, p. 43, sub *P. coccinea*)] Bayern: Hb. Caucasici'. **B)** '*Phelipaea Biebersteinii*/Dr. G. de Beck'. **C)** 'I. Novopokrovsky. Notae criticae. *Phelypaea bayerni* Novopokr./Typus! 1948. 18-V'. **D)** '*Phelypaea coccinea* Poir/(возможно, гибридный экз. с *Ph. Tourne-/fourtii* Desf.)/1954.XII.20 Teste: Tzvelev'. (LE01015400, seven specimens of same gathering; Supporting information). — Other relevant original material: – **A)** 'Bayern: Hb. Caucasici/*Orobanche* Linné/*coccinea* Linné/*Anoplanthus biebersteinii* Reut./Pr./*Orobancheae*/ Daralagoz Rich [?]'. **B)** '*Phelipaea Biebersteinii*/Dr. G. de Beck'. **C)** 'I. Novopokrovsky. Notae criticae. *Phelypaea bayerni* Novop./Typus!, 1948. 18-V'. **D)** '*Phelypaea coccinea* Poir/(возможно, гибридный экз. с *Ph. Tourne-/fourtii* Desf.)/1954.XII.20 Tzvelev'. **E)** 'Bayern s. n./*Phelypaea coccinea* (M.B.) Poiret/≡ *Diphelypaea coccinea* (M.B.) D. H. Nicolson/ined./July 1975 Teste Dan H. Nicolson/ Smithsonian' (LE01015401, two split specimens of same gathering). – **A)** 'Herbarium horti Petropolitani./*Anoplanthus biebersteinii* Reut. Pr/Bayern: Hb. Caucasici'. **B)** '*Phelypaea Biebersteinii*/Dr. G. de Beck'. **C)** 'I. Novopokrovsky. Notae criticae. *Phelypaea bayerni* Novopokr., 1948. 18-V'. **D)** '*Phelypaea coccinea* Poir/(возможно, гибридный экземпляр с *Ph./Tournefourtii* Desf.)/1954.XII.20 Teste: Tzvelev' [LE01015402, the both right plants; the left plant ('*Orobanche/coccinea*/Pech in Karabach [written in pencil later?]' may not correspond to the same gathering, although it seems to be collected in Karabakh [Beck 1930, p. 43, sub *P. coccinea*], if the other two specimens and floral pieces)].

Subject to further examination, we provisionally place the name in the synonymy of *Phelypaea coccinea* (M.Bieb.) Poir.

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Author contributions

Holger Uhlich: Conceptualization (lead); Data curation (lead); Investigation (lead); Methodology (lead); Project administration (lead); Resources (lead); Software (lead); Supervision (lead); Validation (lead); Visualization (lead); Writing – original draft (lead); Writing – review and editing (lead). **Stefan Rätzel**: Conceptualization (equal); Investigation (equal); Methodology (equal); Project administration (equal); Validation (equal); Writing – review and editing (equal). **Oscar Sánchez Pedraja**: Conceptualization (supporting); Investigation (supporting); Resources (supporting); Validation (supporting); Writing – review and editing (supporting). **Renata Piwowarczyk**: Conceptualization (supporting); Resources (supporting); Validation (supporting); Writing – review and editing (supporting). **Valerio Lazzeri**: Conceptualization (supporting); Investigation (supporting); Resources (supporting); Validation (supporting); Writing – review and editing (supporting). **Patrice Descombes**: Conceptualization (supporting); Investigation (supporting); Resources (supporting); Validation (supporting); Writing – review and editing (supporting).

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