

**Zeitschrift:** Candollea : journal international de botanique systématique = international journal of systematic botany  
**Herausgeber:** Conservatoire et Jardin botaniques de la Ville de Genève  
**Band:** 58 (2003)  
**Heft:** 1

**Artikel:** Orobanche hirtiflora subsp. zosimii M. J. Y. Foley (Orobanchaceae) : a new subspecies from Cyprus  
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**DOI:** <https://doi.org/10.5169/seals-879293>

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# Orobanche hirtiflora subsp. zosimii M. J. Y. Foley (Orobanchaceae), a new subspecies from Cyprus

MICHAEL J. Y. FOLEY

## ABSTRACT

FOLEY, M. J. Y. (2003). *Orobanche hirtiflora* subsp. *zosimii* M. J. Y. Foley (Orobanchaceae), a new subspecies from Cyprus. *Candollea* 58: 83-95. In English, English and French abstracts.

The taxonomy of a previously unidentified *Orobanche* L. (Sect. *Trionychon* Wallr.) from Cyprus is discussed and compared to that of other similar taxa including *O. libanotica* (Boiss.) Beck, *O. oxyloba* (Reut.) Beck, and *O. hirtiflora* (Reut.) Tzvel. It is concluded that the Cyprus plant is a separate taxon most appropriately placed at subspecific level as *O. hirtiflora* subsp. *zosimii* M. J. Y. Foley, subsp. nova. A lectotype is designated for *Phelipaea hirtiflora* Reut.

## RÉSUMÉ

FOLEY, M. J. Y. (2003). *Orobanche hirtiflora* subsp. *zosimii* M. J. Y. Foley (Orobanchaceae), une nouvelle sous-espèce décrite de Chypre. *Candollea* 58: 83-95. En anglais, résumés anglais et français.

La taxonomie d'une *Orobanche* L. (Sect. *Trionychon* Wallr.) encore inconnue de Chypre est discutée par rapport à des taxons proches, *O. libanotica* (Boiss.) Beck, *O. oxyloba* (Reut.) Beck et *O. hirtiflora* (Reut.) Tzvel. Le taxon de Chypre est reconnu comme distinct et est décrit sous le nom d'*O. hirtiflora* subsp. *zosimii* M. J. Y. Foley, subsp. nova. Un lectotype est désigné pour *Phelipaea hirtiflora* Reut.

**KEY-WORDS:** OROBANCHACEAE – *Orobanche hirtiflora* – *Phelipaea* – Taxonomy – Lectotypification – Cyprus – Lebanon – Iran.

## Introduction

Amongst the phrygana and vineyards on the dry, rocky hillsides of southern central Cyprus, especially in the area to the south of Trimiklini, can be found an *Orobanche* of Sect. *Trionychon* Wallr. which exhibits a combination of distinctive characters suggesting that it is not conspecific with any previously described taxon.

The plant is typically 100-150 mm tall, with a simple or sparsely branched, broad, pale yellow stem and very pale lilac-blue, erecto-patent flowers. It is especially characterised by the lower lip of its corollas which bear relatively long (4.0-4.5 mm) widely-spaced, oblong-trullate lobes, and whose margins are fringed with white, eglandular hairs and frequently with a few acute-mucronate protrusions. The corolla (c. 20 mm long) is tubular, broadening distally, slightly curved, but not constricted above the ovary, the latter character in opposition to that typical of most other members of the Section. The filaments, inserted (4-)5-6 mm above the corolla base, are glabrous throughout and also at their base, and the anthers are clothed with fairly long white eglandular hairs. The styles bear scattered glandular hairs and the stigma lobes are very pale blue. To date, it has only been found to parasitise *Zosima absinthifolia* (Vent.) Link (*Apiaceae*). These

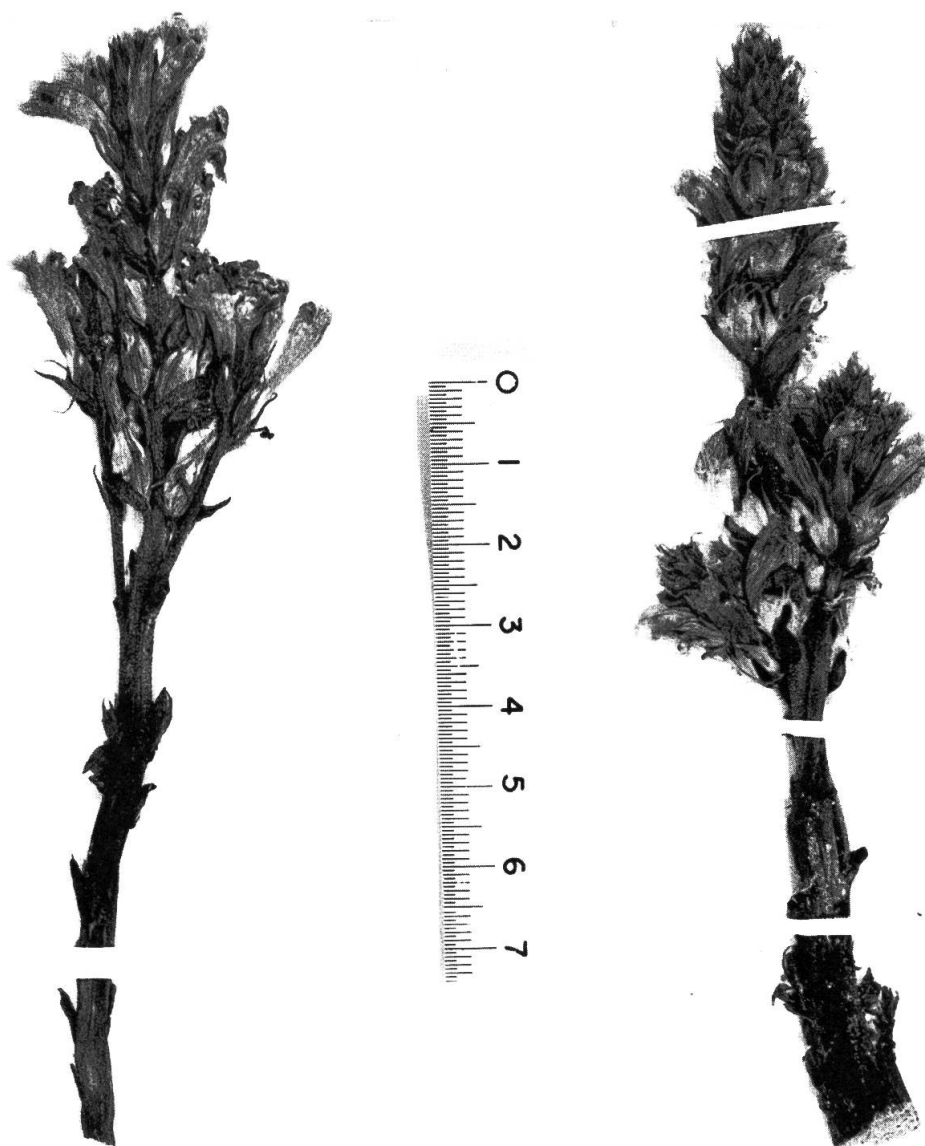
**Table 1. – Comparative characters of relevant taxa (Information based upon the original authors' descriptions, an examination of type specimens, and field notes on the *Cyprus* plant)**

	<b><i>Cyprus</i> plant *</b>	<b><i>Ph. libanotica</i></b>	<b><i>Ph. oxyloba</i></b>	<b><i>Ph. hirtiflora</i></b>	<b><i>Ph. tricholoba</i></b>
<b>Plant height</b>	100-150 mm	fairly small	90-160 mm	130-170 mm	130-200 mm
<b>Stem</b>	quite thick, simple or branched	simple	slender, simple or slightly branched	thick, branched	thick, branched
<b>Inflorescence</b>	fairly dense, flowers erecto-patent	quite dense?, flowers erecto-patent?	± lax, flowers erecto-patent	dense, flowers ± erect	dense, flowers ± erect
<b>Corolla length</b>	c. 20 mm	c. 25 mm	14-16 mm	20-21 mm	18-20 mm
<b>Corolla: shape, constriction</b>	broadly tubular, not constricted	tubular-campanulate, constricted	tubular-infundibuliform, constricted	tubular-infundibuliform, not constricted	tubular-infundibuliform, not constricted
<b>Lobes of lower lip</b>	oblong-trullate, 4.0-4.5 mm long, widely spaced, often with mucronate protrusions	ovate, obtuse, abruptly cuspidate	triangular-ovate, acute, patent, lobes subequal	ovate, acute, middle lobe the longer	ovate, obtuse
<b>Ciliation of lobes</b>	with white, eglandular hairs	shortly papillose	ciliate	densely ciliate, articulated hairs	ciliate
<b>Filaments</b>	glabrous, and also at base; inserted (4-)5-6 mm above base	not known	glabrous or slightly ciliate at base	± glabrous	somewhat pilose at the base
<b>Anthers</b>	with long white, eglandular hairs	lanate	sub-lanuginous	pilose-lanate	pilose-lanate
<b>Style</b>	scattered glandular hairs	not known	slightly glandular	glandular	glandular
<b>Host</b>	<i>Zosima absinthifolia</i>	not known	<i>Anthemis chia</i>	not known	<i>Astragalus spinosus</i>

\* Now described as *Orobancha hirtiflora* subsp. *zosimii*.



Plate 1. – *Orobanchae hirtiflora* subsp. *zosimii* M. J. Y. Foley parasitising *Zosima absinthifolia* (Vent.) Link near Trimiklini, Cyprus in 1992.



*Orobanchaceae hirtiflora Reut.*

mt. Persepolis.

leg. Kotschy

spec. n. n. n. n. n.

Plate 2. – Preserved specimens of the two subspecies of *Orobanche hirtiflora* (Reut.) Tzvel. **Left:** *Orobanche hirtiflora* subsp. *hirtiflora* from “Persepolis” [Iran] [Kotschy s/n, BM]. **Right:** the holotype of *Orobanche hirtiflora* subsp. *zosimii* M. J. Y. Foley from Cyprus [Foley 162, E].

characters are summarised in Table 1, whilst the living and preserved plant is illustrated in Plates 1 & 2 respectively.

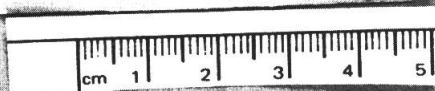
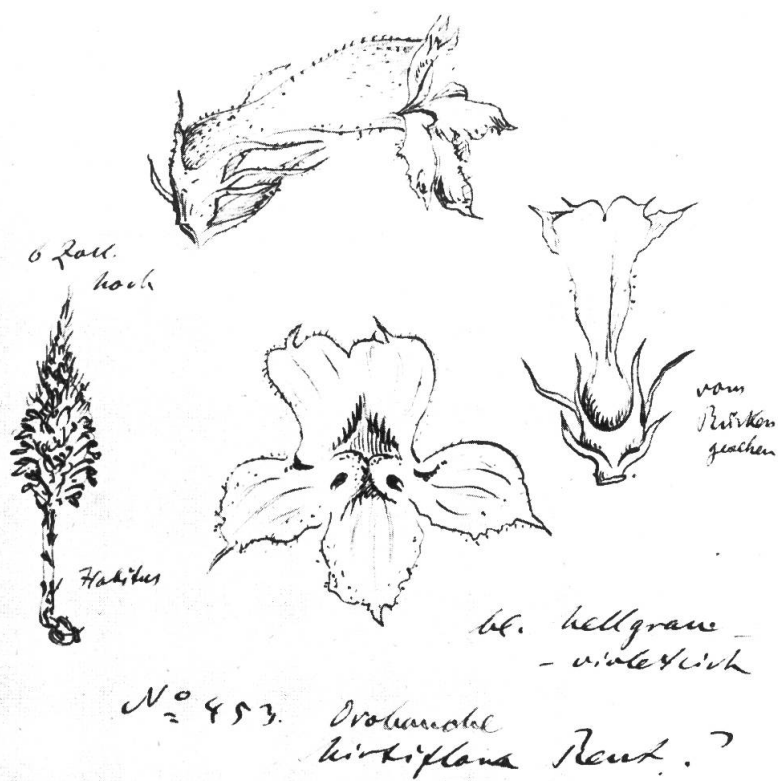
From the description in *Flora of Cyprus* (MEIKLE, 1985): “stems commonly unbranched or sparingly branched, often thick and robust; cauline scales and bracts frequently pale; inflorescence compact, rather congested; flowers usually larger than in var. *ramosa*; corolla-tube often more than 15 mm long” the author appears to have included this plant within *O. ramosa* L. as var. *brevispicata* (Ledeb.) R. A. Graham (syn.: *O. mutelii* F. W. Schultz; = *O. ramosa* subsp. *mutelii* (F. W. Schultz) Cout.). This he records for much of the island where he considers it to be a parasite of various plant families, including members of the *Apiaceae*. However, he adds a cautionary note to the effect that “distinctions between *O. ramosa*, *O. nana*, *O. mutelii* and *O. schultzii* [i.e. all closely related taxa within Sect. *Trionychon*] are, at least as regards Cyprus material, so unsatisfactory that all records have been referred to *O. ramosa* L. It may be that field and experimental study of the group will show that it can be subdivided into meaningful, recognisable taxa. Existing classifications cannot be said to achieve this goal”. It is likely that *Orobanche* populations referable to several of the taxa listed above by Meikle do, in fact, occur in Cyprus but from the description of the plant in question (and especially its flower morphology and pilosity) it, at least, seems to be quite distinct from them and from most other taxa within Sect. *Trionychon*. The question, therefore, is where do its affinities lie and what is its identity? In the discussion below it will be referred to as the “Cyprus” plant.

### Related taxa

Cyprus, being an island in the eastern Mediterranean of long geographical isolation, possesses many endemic species; such taxa have their closest relatives in Turkey, the Middle East, or other nearby areas of western Asia. Conversely, several western Asiatic taxa approach their western limit on the island. Examples are found, for instance, in the genus *Salvia*, where *S. veneris* Hedge, endemic to Cyprus, is closely related to *S. cassia* Rech. f. and *S. cilicica* Boiss. & Kotschy (both endemic to Turkey), whilst *S. hierosolymitana* Boiss. and *S. pinnata* L., both mainly plants of the Middle East, reach westwards to the northern coastal plain of the island. Within the genus *Orobanche* there is the Cyprus endemic, *O. cypria* Reut., whilst the western Asiatic *O. orientalis* Beck also occurs on the island. It is possible, therefore, that the Cyprus *Orobanche* now under discussion may be endemic but also have close relatives in western Asia.

Some 200 km or so to the south-east of Cyprus lies Lebanon from where a rather similar plant has been recorded: *Phelipaea libanotica* Boiss. (= *O. libanotica* (Boiss.) Beck). In the past, taxa within *Orobanche* Sect. *Trionychon* were frequently placed in the separate genus *Phelipaea* Tourn. The original description of *Ph. libanotica* was published by BOISSIER (1888) based on manuscript notes made by the Latvian-born botanist and explorer Georg Schweinfurth (1836-1925). These were of plants which he found in the mountains of northern Lebanon in September 1880. No entire specimens appear to survive and none may have been collected, but a few fragments of flowers taken at the time together with Schweinfurth's drawing of the plant are in the Geneva herbarium (G-BOIS, photo!, Plate 3); these were also used by Boissier when describing the plant. The locality is given as the mountain pass between Ainhata and Bscherre, an area now known as the Col des Cèdres. No mention is made of a possible host.

Boissier's description of the plant refers to its simple stem, short, dense-flowered, acute-pyramidal inflorescence, its bracts broader at the base and subulate, those above exceeding the buds of the spike, the calyx having 4 or 5 lanceolate, subulate-attenuate teeth, the corolla exceeding the length of the calyx by the order of 2.5 times, pale grey-violet, shortly papillose-hairy, tubular-campanulate, retuse, the lobes ciliate, ovate, obtuse, abruptly cuspidate, and the anthers lanate. The type of the name is therefore Schweinfurth's drawing (*Schweinfurth* 453) together with the few fragments of flowers, both of which are now attached to the single herbarium sheet in G-BOIS. Schweinfurth's drawing includes a general view of the habit of the plant together with lateral and frontal views of the corolla, as well as the calyx. The ovate, cuspidate lobes of the lower lip of the corolla, are clearly shown as is also the sharp constriction in the tube at a point immediately above the ovaries. The ciliation of the lobes, although referred to in the



sp. nova? affinis bl. hellgrau violett  
Phel. kirkiflora

Nº 453 Orobanchaceae kirkiflora Reut.

Passhöhe zwischen Ainuta und Bschere  
2378 Met.

Libanon. Septor. Anfang Dr. G. Schweinfurth  
1880



*Phelipaea oxyloba* Reut.

description, is not readily apparent. There is a note on the drawing in Schweinfurth's hand: "*Orobanche hirtiflora* Reut.?", and separate labels in Boissier's hand stating "*Phelipaea libanotica* Schweinf." (but not shown in Plate 3) and "sp. nova? affinis *Phel. hirtiflora*". At the end of his formal description, BOISSIER (1888) adds the comment that "in its simple unbranched stem [the Lebanese plant] is similar to *Ph. caerulea* and *Ph. longiflora*, and in its ciliate corollas to *Ph. oxyloba* and *Ph. hirtiflora*, but that it is distinct from all of them in its abruptly cuspidate corolla lobes" [translated from Latin].

Most of Schweinfurth's collections in the Berlin herbarium (B) were destroyed during the 1939-45 hostilities. Enquiries and searches at other major herbaria (e.g. BM, E, G, K, PRC, W) have so far failed to locate any duplicates and, much more surprisingly, any collections of the plant made by others. In his monograph on the genus, BECK (1930) claims not to have seen the Schweinfurth collection nor (apparently) any later specimens either, and regional Floras which cover Lebanon (e.g. POST, 1933; MOUTERDE, 1980) reveal no additional details but simply repeat those of Boissier.

The main characters of this plant are summarised in Table 1. Although in its general habit, its corolla colour, its cuspidate and presumed ciliate lobes, and its lanate anthers, *O. libanotica* shows similarities to the Cyprus plant, it differs from it in lacking the relatively long, widely-spaced, oblong-trullate lobes of the lower lip of the corolla, these with a quite distinct fringe of long white hairs, and in possessing a constricted (cf. Schweinfurth's drawing) corolla tube. Also, the few corollas in Schweinfurth's collection are much longer (25 mm) than those of the Cyprus plant (20 mm). It is concluded that the two, although probably related, are not conspecific.

Two other *Orobanche* species with ciliate-lobed corollas, *Ph. oxyloba* Reut. and *Ph. hirtiflora* Reut., were referred to by BOISSIER (1888) when discussing *Ph. libanotica*. *Phelipaea oxyloba* was described from south-west Turkey (Caria) (REUTER, 1847) based on specimens parasitic on *Anthemis chia* collected in 1845. He described the corolla as tubular-infundibuliform, constricted above the ovary, the lobes triangular-ovate, acute and ciliate, the stamens glabrous or slightly ciliate at the base, the anthers sub-lanuginous, and the style slightly glandular; the corolla was of a similar size to *O. ramosa* L. (i.e. 12-17 mm long). Specimens of the type collection ("Alaya, in *Anthemis chia* parasitica, iv. 1845, de Heldreich", G-BOIS, photo!, G!, Plate 4) have  $\pm$  constricted corollas 14-16 mm in length, whose morphology (and ciliation of the lobes of the lower lip) do not appear to approach that of the Cyprus plant. As *O. oxyloba* (Reut.) Beck, it was recorded by BECK (1930) as occurring in two varieties over a range reaching from the Adriatic eastwards through Turkey to the Caucasus; he also included a record from the Pentadactyl mountains of northern Cyprus by Sintenis & Rigo. Again, although possibly related to the Cyprus plant, there are many dissimilarities, especially in habit, corolla size and constriction, ciliation of the lobes, and choice of host (Table 1). Again, the two are not conspecific.

In the same publication (REUTER, 1847) in which he described *Ph. oxyloba*, the author also described two other related taxa: *Ph. hirtiflora* and *Ph. tricholoba* Reut. based on specimens of what he considered to be a mixed collection (*Kotschy* 408) dated 20 May, 1842 from southern Iran ("Persiâ australi"). Both of these also had ciliate-margined corollas. For *Ph. hirtiflora*, a branched stemmed plant, he found the lobes of the lower lip to be ovate, acute, the central the longest, the margins densely ciliate with articulated hairs, the filaments  $\pm$  glabrous, the anthers pilose-lanate and the styles glandular, i.e. all suggesting a distinct similarity to the Cyprus plant. He also specified a further syntype, the collection *Kotschy* 920. At the end of his description of *Ph. hirtiflora* he added the comment that the plant showed an affinity to *Ph. tricholoba* (see immediately below) but differed in its larger flowers (which were similar in size to "*Ph. arenaria*" (= *O. arenaria* Borkh.)) – [i.e. of order 30-40 mm long], whereas those of *Ph. tricholoba* were similar to "*P. coerulea*" (= *O. purpurea* Jacq.), i.e. 20-25 mm long. *Phelipaea tricholoba*, was collected "*in Persiâ australi prope ruinas urbis Persepolis*" [Iran] growing amongst *Astragalus spinosus* (Forssk.) Muschl. This he also described as branched-stemmed, the corolla with ciliate margins, the lower lobes ovate, obtuse, the filaments somewhat hairy at their base, the anthers pilose-lanate, and the style again glandular; he also recognised a non-branched variety



Plate 5. – Type of *Phelipaea tricholoba* Reut. (G-BOIS).

with a glabrescent corolla ( $\beta$ . *simplex*) based on the collection: *Aucher-Eloy* 5076 (isotype in BM!).

### Conclusions

Specimens or photographs from all of these collections (BM, G-BOIS, G-DC) have been examined. The perceived differences in size and morphology of the corolla between *Ph. hirtiflora* and *Ph. tricholoba* are not evident from the type specimens. Furthermore, specimens from the type gathering of *Ph. tricholoba* (*Kotschy* 408, BM!) – stated to have been collected from amongst *Astragalus* near Persepolis, [Iran] (a plant which should therefore be *Ph. tricholoba*), have been named in Reuter's hand as "*Phelipaea hirtiflora* Reut.". The corolla length of this specimen and that of the other syntype of *Ph. hirtiflora* (*Kotschy* 920, G-BOIS, photo!) appear to fall within the range 20-21 mm. This is similar (18-20 mm) to that for the Cyprus plant and also for the type specimen of *Ph. tricholoba* ("prope ruinas u. Persepolis", 1842, *Kotschy* 408, G-BOIS, photo!, Plate 5) which bears that name in Reuter's hand and another so named by him (G-DC, photo!). The main characters of *Ph. hirtiflora* and *Ph. tricholoba* are summarised in Table 1.

Judged from these specimens, the corollas of *Ph. hirtiflora* are therefore not of a size typical of *O. arenaria* Borkh. as stated by Reuter. Also, their examination suggests that *Ph. hirtiflora*



Plate 6. – Lectotype of *Phelipaea hirtiflora* Reut. (*Kotschy* 920, G-BOIS).

and *Ph. tricholoba* (excluding var. *simplex* which, from its original description and an examination of an isotype (BM!), appears to be a separate taxon) represent forms of slight variation within a single species. Due to this and to the potential uncertainty of the composition of the (possible) mixed collection of *Kotschy 408*, and to the fact that the author of both names (i.e. Reuter) introduced confusion by (subsequently?) redetermining one of the specimens from the type collection of *Ph. tricholoba* as *Ph. hirtiflora*, it is proposed that the former should be placed as a synonym of the latter (i.e. of *Ph. hirtiflora*). The specimen *Kotschy 920* (G-BOIS, photo!) fully conforms with Reuter's description of *Ph. hirtiflora* and is here designated as the lectotype (Plate 6).

BECK (1930), however, although also considering them to be the same plant, placed *Ph. tricholoba* under *O. aegyptiaca* Pers. as var. *tricholoba* (Reut.) Beck, with *Ph. hirtiflora* a synonym. This is partly in agreement with TZVELEV (1957) who retained *Ph. hirtiflora* as a separate species under the new combination *Orobancha hirtiflora* (Reut.) Tzvel. Slightly later (TZVELEV, 1958: see the Smithsonian translation (1999)) he tentatively placed *Ph. tricholoba* under synonymy but then added the rather confusing comment: "The separateness of *O. hirtiflora* (Reut.) Tzvel. cannot be doubted". His description of the plant is also not in full agreement with characters evident from the type material or with information gained during this study, especially the apparent corolla length which he quotes as 25-30 mm, appreciably greater than that found in the type specimen. This misconception regarding corolla size was also perpetuated by SCHIMAN-CZEIKA (1964).

The principal characters of all of the five taxa discussed above are summarised in Table 1.

From all of this it can be seen that the Cyprus plant possesses very similar morphological characters to those described by the original author of *Ph. hirtiflora* and those now observed on the type specimens. The lobes of the lower lip of the corollas of *Ph. hirtiflora* are described as ovate (i.e. not  $\pm$  trullate-oblong), are not widely spaced, the middle lobe is the longest, and the flowers are  $\pm$  erect. Otherwise, the shape, curvature, and the lack of constriction to the corolla, the ciliation of the lobes of the lower lip, and the general habit of the plant, suggests that the Cyprus plant is best included as a subspecies of *Ph. hirtiflora*, under the combination *Orobancha hirtiflora* (Reut.) Tzvel. A preserved specimen of this in comparison with one from a collection of Kotschy from "Persepolis" (BM!) and named by Reuter as *Ph. hirtiflora* is shown in Plate 2.

### Key to *Orobancha hirtiflora* (Reut.) Beck and closely related taxa

Stems simple or branched, bracteoles present, corolla bluish, lobes of lower lip densely ciliate, anthers lanate.

1. Corolla distinctly constricted above the ovary ..... 2
- 1a. Corolla not, or only very slightly, constricted ..... 3
2. Corolla 14-16 mm long, lobes of lower lip triangular-ovate, acute ..... *O. oxyloba*
- 2a. Corolla c. 25 mm long, lobes of lower lip ovate and abruptly cuspidate ... *O. libanotica*
3. Flowers  $\pm$  erect, lobes of lower lip of corolla ovate, acute, central lobe the longest ..... *O. hirtiflora* subsp. *hirtiflora*
- 3a. Flowers erecto-patent, lobes of lower lip of corolla widely-spaced, oblong-trullate, all of  $\pm$  similar length, parasitic on *Zosima absinthiifolia* ..... *O. hirtiflora* subsp. *zosimii*

### Description

*Orobancha hirtiflora* (Reut.) Tzvel. in Karjagin, Fl. Azerb. 7: 569. 1957.

= *Phelipaea hirtiflora* Reut. in DC., Prodr. 11: 10. 1847.

**Lectotype here designated:** *Kotschy 920* (G-BOIS, photo!), Plate 6; **syntype:** "In Persiâ [Iran] australi", *Kotschy 408* ex parte (G-BOIS, BM).

Stem 100-200(-250) mm tall, simple or branched, broad; inflorescence quite dense; flowers  $\pm$  erect to erecto-patent; corolla typically 18-21 mm long, not constricted above the ovary, broadly tubular to tubular-infundibuliform, slightly curved; lobes of lower lip ovate to oblong-trullate, moderately- to widely-spaced, of similar length or central lobe the longest, obtuse to  $\pm$  acute, with or without mucronate protrusions; margins ciliate and/or with long white eglandular, articulated hairs; filaments glabrous or almost so; anthers pilose-lanate with longish, white hairs; style with scattered glandular hairs.

subsp. *hirtiflora*

- = *Phelipaea tricholoba* Reut. in DC., Prodr. 11: 10. 1847.  $\equiv$  *Orobanche aegyptiaca* var. *tricholoba* (Reut.) Beck in Biblioth. Bot. 19: 103. 1890. **Type:** "In Persiâ australi prope ruinas urbis Persepolis", *Kotschy 408* (G-BOIS, photo!), Plate 5.

Flowers  $\pm$  erect, the lobes of lower lip of corolla, ovate, acute; the central lobe the longest. Parasitic on *Astragalus spinosus*.

subsp. *zosimii* M. J. Y. Foley **subsp. nova**

- *O. ramosa* var. *brevispicata* sensu Meikle, Fl. Cyprus 2: 1235. 1985, non (Ledeb.) R. A. Graham.

**Holotype:** "Phrygana, 2 km south of Trimiklini, Cyprus", 16.V.1992, *Foley 162* (E), Plate 2, right hand specimen.

*Ab* subsp. *hirtiflora*, floribus erecto-patentibus, lobis inferioribus labellorum omnibus aequilongis, longioribus, late separatis, saepe mucronatis, oblongo-trullatis differt. Parasitica in *Zosima*.

Differs from subsp. *hirtiflora*, in flowers erecto-patent, lobes of the lower lip of the corolla more widely spaced, longer, oblong-trullate, often with mucronate protrusions, all lobes of similar length.

Height 100-150 mm, stem simple or sparsely branched, broad, pale yellow; the flowers very pale lilac-blue, erecto-patent; corolla c. 20 mm long, tubular, broadening distally, slightly curved but not constricted above the ovary; lobes of lower lip relatively long (4.0-4.5 mm), widely-spaced, oblong-trullate lobes, the margins fringed with white, eglandular hairs, often with a few acute-mucronate protrusions; filaments, inserted (4-)5-6 mm above the corolla base, glabrous throughout and at the base; anthers with fairly long white eglandular hairs; styles with scattered glandular hairs; stigma lobes very pale blue. Parasitic on *Zosima absinthiiifolia*.

On chalk in lightly vegetated phrygana and derelict vineyards, locally frequent in south-central Cyprus; also probably elsewhere on the island. Flowering April-May.

#### ACKNOWLEDGMENTS

I am very grateful to the curators of the herbaria: B, BM, E, G, K, PRC and W for the loan of material or for searching their collections for relevant specimens, to F. Jacquemoud (Geneva) for providing photographs and information regarding type specimens, and to I. Hedge (Edinburgh) for assistance with some Latin translations.

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