

Gianniantonio Domina & Pier Virgilio Arrigoni

The genus *Orobanche* (*Orobanchaceae*) in Sardinia

Abstract

Domina, G. & Arrigoni P. V.: The genus *Orobanche* (*Orobanchaceae*) in Sardinia. — Fl. Medit. 17: 115-136. 2007. — ISSN 1120-4052.

The taxa of *Orobanche* occurring in Sardinia and on the surrounding islets have been surveyed in the field and in herbaria. In total, 22 species occur in the region. Among them, 2 (*O. foetida* and *O. teucrii*) are new to the island, one (*O. lavandulacea*) previously doubtfully recorded, is confirmed. *O. litorea* is considered to be distinct from *O. minor*, and *O. australis* from *O. canescens*.

Key words: Flora, Taxonomy, Broomrapes, Parasitic plants, Italy.

Introduction

The genus *Orobanche* consists of parasitic plants that become fragile and lose important discriminating characters by drying. Their short flowering period also contributes to the fact that taxonomy, nomenclature and distribution of many *Orobanchaceae* are still imperfectly known. Indeed, herbarium specimens are frequently uninformative, whereas photographs and field notes are not available for all taxa.

In the frame of the planned revision of *Orobanche* for the whole of Italy (Domina & Mazzola 2005, 2007), the taxa occurring in Sardinia have been studied in the field and in herbaria.

The first records of *Orobanche* from Sardinia date back to Moris (1827), who in the first part of “*Stirpium sardoarum elenchus*” indicates 7 species (*O. caryophyllacea* Sm., *O. caerulea* Vill., *O. elatior* Sutt., *O. major* L., *O. minor* Sm., *O. ramosa* L., *O. speciosa* DC.), one in part 2 (1827: *O. condensata* Moris), and one in the Appendix (1828: *O. denudata* Moris). Only ***O. ramosa*** (sub *Phaelipaea ramosa* C.A. Mey), ***O. minor***, ***O. denudata*** and *O. condensata* (= ***O. variegata*** Wallr.) are confirmed in the Flora sardoa (Moris 1858-59) and *Phelypaea stricta* Moris (= ***O. schultzii*** Mutel), *Phelypaea mutelii* Reut. (= ***O. mutelii*** F. W. Schultz), *Phelypaea reuteri* Moris (= *P. concolor* Moris and ***O. mutelii*** F. W. Schultz), *O. thyrsoidea* Moris (= *O. rigens* Loisel.), *O. rapum* Thuill. (= *O. rapum-genistae* Thuill.), *O. grandiuscula* Moris (= *O. gracilis* Sm.), *O. crinita* Viv. (= ***O. sanguinea*** var. ***crinita*** (Viv.) Bég.), *O. densiflora* Salzm. (for ***O. litorea*** Guss.), *O. ambigua* Moris (for ***O. picridis***

Schultz), *O. australis* Moris ex Bertol., *O. amethystea* Thuill. and doubtfully *O. canescens* C. Presl are added.

Afterwards Gennari (1890) confirms *O. hederæ* Duby, considered as extinct by Moris (1858-1859).

At the beginning of the XX century Béguinot (1902) reports from Sardinia the 15 species in bold besides *O. ramosa* subsp. *nana* (Reuter) Coutinho and doubtfully *O. lavandulacea* Rchb. following a synonymy by Moris with *Phelypaea reuteri* Moris.

Fiori (1926) added *O. crenata* Forssk., collected by Vaccari (1908) in the Maddalena Island, and *O. barbata* var. *typica*, sensu Fiori (probably = *O. litorea* Guss.).

The checklist of species occurring in Sardinia remained basically unchanged in the recent floras (cfr. Chater & Webb 1972; Pignatti 1982; Greuter & al. 1989) except Conti & al. (2005), that report: *O. alba* Steph. ex Willd., *O. densiflora* Salzm. ex Reut. and *O. lutea* Baumg. that need to be confirmed in the region, besides *O. artemisiae-campestris* Gaudin (including *O. picridis* F. W. Schultz).

Materials and methods

Visited herbaria were: FI (incl. Arrigoni's collections), RO-HC, BOLO, TO, CAG, PAL, SS, B, MA, PRC and W. In addition field surveys in the whole region were carried out in the years 2002-2006. For each species the most relevant synonyms, the type indication (when known), the first record from the region, the hosts, the distribution, the specimens visa and contingent notes are reported.

Results

The following taxa result occurring in Sardinia and in the surrounding islets:

Orobanche amethystea Thuill., Fl. Paris ed. 2: 317. 1800

= *Orobanche eryngii* Duby, Bot. Gall.: 350. 1828

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1806.

First record: Moris (1858-59).

Hosts: Generic parasite, mostly on *Apiaceae* and *Asteraceae*: *Eryngium campestre* L., *Daucus carota* L., *Thymus herba-barona* Loisel., etc.

Distribution: Reported from many localities, but probably mistaken with other species. It occurs scattered along the coast as well as in the inland.

Specimens seen: Cagliari, 04.1858, Gennari (TO) - Isola S. Antioco, 12.04.1894, Martelli (FI) and 29.04.1894, Martelli (FI) - Seui, 22.6.1971, Arrigoni & Ricceri (FI) - Monte Linas, 4.1984, Angiolino & Chiappini (CAG) - Dorgali, Cala Gonone, 18.5.1984, Rizzotto (FI) - Isola dei Cavoli, Martelli (FI) - Perdas de Fogu, 06.06.2003, Aedo & al. (MA) - Perdas de Fogu, 06.06.2003, Domina (PAL).

Orobanche australis Moris ex Bertoloni, Fl. Ital. 6: 440. 1846 (Fig. 1)

First record: Bertoloni (1846).

Hosts: *Compositae*.

Distrib.: Rare, it has been found in the last 50 years only in the Asinara island.

Specimens seen: Sardinia, misit 1846, Moris (BOLO) - Arizzo, 8.1851, Gennari (TO) - Sardinia, misit 1853, Moris (FI); Sardinia, s.d., Moris (RO-HC) - Laconi, s.d., Masala (TO) - Monti di Capoterra e Santa Barbara, s.d., Gennari (TO) - Isola dell'Asinara, 29.05.1968, Barba (FI).

Note: This taxon only known from Sardinia, was included by Beck (1890, 1930) in *O. canescens* C. Presl. Nevertheless, owing to the clear characters of the corolla and of the spike, it has been reevaluated as an independent, well distinct, species (Domina & Mazzola 2005).

Orobanche canescens C. Presl in J. & C. Presl, Delic. Prag.: 72. 1822

= *O. lucana* N. Terracc. in Bull. Orto Bot. Univ. Napoli, 3: 163. 1913

Icon.: In Lojacono (1882) Naturalista Sicil. 1(11): tav. 9 fig. 2.

First record: Moris (1858-59).

Hosts: *Compositae*: *Carlina lanata* L., *Galactites tomentosa* Moench, *Gazania rigens* (L.) Gaertn., *Sonchus oleraceus* L., etc.

Distribution: Rather frequent in the whole island, both along the coast as well as on the mountains.

Specimens seen: Sardinia, misit 1828, Moris (BOLO) - Monte Linas, 4.1984, Angiolino & Chiappini (CAG) - Riu Tronau, Arbus (Cagliari), 5.5.2003, Bacchetta & al. (CAG) - Stazzu Aroni, Uta (Cagliari), 11.04.1993, Bacchetta (CAG) - Dorgali, Cala Gonone, 17.5.1984, Arrigoni, Ricceri & Rizzotto (FI) - Lula, monte Albo, 21.6.1972, Arrigoni & Nardi (FI) - Arbus, dune collinari di Piscinas, 8.5.1969, Arrigoni & Ricceri (FI) - Orgosolo, 7.7.1973, Arrigoni, Sartoni, Di Tommaso (FI) - Isola di Tavolara, 19.05.1994, Arrigoni (FI) - Milis, 26.04.2006, Domina (PAL) - Magomadas, 26.04.2006, Domina (PAL) - Sassari, s.d., Nicotra (RO-HG).

Orobanche crenata Forssk., Fl. Aegypt.-Arab.: 113. 1775

= *O. speciosa* DC. in Lam. & DC., Fl. Fr. suppl.: 393. 1815

= *O. pruinosa* Lapeyrouse, Abr. Pl. Pyr. suppl.: 87. 1818

= *O. pelargonii* Caldesi in Nuovo Giorn. Bot. Ital. 12(3): 175. 1880

= *O. tommasini* Rechb. f., Ic. Fl. Germ. Helv. 20: 92. 1862

Icon. - In Vaucher (1827) Monogr. Orobanches: Pl. 5.

First record: Moris (1827) sub *O. speciosa* sensu Moris non DC.

Hosts: Annual legumes: *Pisum elatius* M. Bieb., *Vicia faba* L., *Vicia sativa* L., etc.

Distribution: Scattered mainly along the coast, and also in the Gennargentu. Reported by Moris (1858-59) from Aritzo, it occurs also in the Asinara, the Mount Linas and other localities in the Sulcis-Iglesiente.

Specimens seen: Sassari a S. Anatolia, 09.05.1895, Martelli (FI) - Colle San Michele (Cagliari), 3.5.1989, Zedda (CAG) - Isola Maddalena, 16.05.1907, Vaccari (FI) - Monte

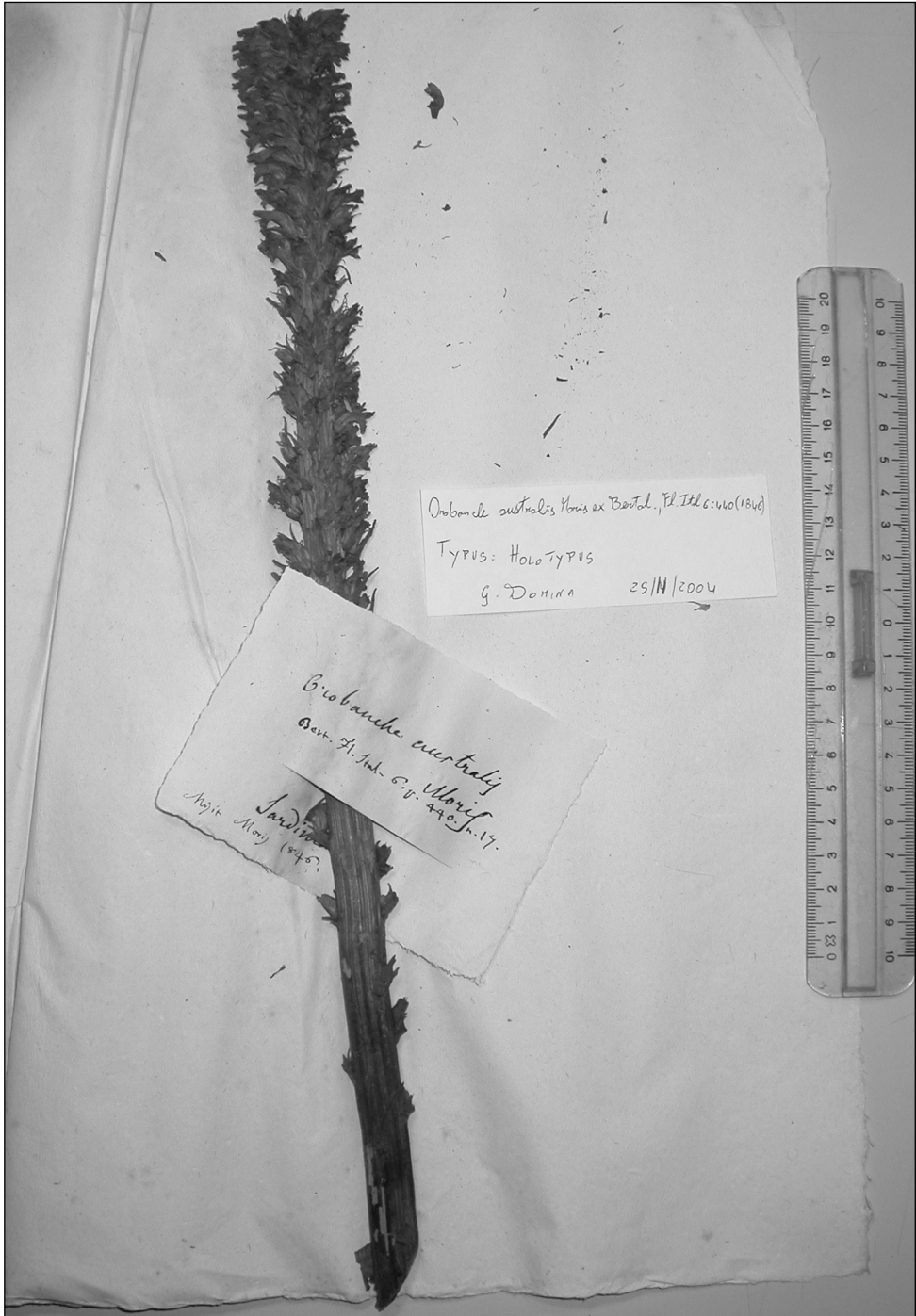


Fig. 1. *Orobanche australis* Moris ex Bertoloni. The type specimen in BOLO.

Gennargentu, Bruncu Spina, 23.7.1968, Arrigoni (FI) - Ussassana, 24.06.1976, Valsecchi (SS) - Cala Vinagra, Isola S. Pietro (Cagliari), 21.03.2002, Bacchetta (CAG).

Orobanche denudata Moris, App. ad Stirp. Sard. Elench.: 1. 1828 (Fig. 2)

= *O. decora* Moris ex Reuter in DC., Prodr. 11: 26. 1847

Icon. - In Moris (1858-1859) Fl. Sard., 3: tav. 105.

First record: Moris (1828, 1829).

Hosts: *Rubus* sp. pl. (*Fide* Moris and Ascherson).

Icon. - In Moris (1858-59) Fl. sard., 3: tab. CV.

Distribution: Sardinian Endemic (Beck 1930; Camarda 1982), occurring in the mountain areas around the Gennargentu. Reported also for coastal localities (Valsecchi 1964b; Martinoli 1947), probably by mistake.

Specimens seen: Arizzo, 6.1827, Müller (B, PRC, W) - Sardinia, misit 1828, Moris (BOLO) - Arizzo, 08.1861, Gennari (FI) - Aritzo, 27.06.1863, Ascherson (FI) - Desulo, Monte Gennargentu, 5.07.1985, Arrigoni & al. (FI) - Desulo, monte Gennargentu, Perda Crispa, 05.07.1985, Arrigoni & al. (FI) - Tra Fonni e Desulo, Badu Ispanu presso il Riu su Troccu, 04.08.1987, Atzei (FI) - Sa Luta, Rio Samunadorgiu, Tonara (Nuoro), 9.7.1994, Mossa (CAG).

Orobanche foetida Poir., Voy. Barbarie 2: 195. 1851

Icon.: Reichenbach (1829) Pl. Crit. 7: tav. 924.

First record: New to Sardinia and Italy.

Hosts: *Leguminosae*.

Distribution: Rare: Known on the basis of two herbarium specimens from Sassari (N-Sardinia) and from the Sulcis (S-Sardinia).

Specimens seen: Logulentu, 05.05.1976, Valsecchi (SS).- Strada che porta a Chia, 28.03.1989, Zedola (CAG).

Note: W Mediterranean species, occurring in Morocco, Tunisia, Portugal, Spain and Balearic islands. The Sardinian findings stretch its distribution eastwards.

Orobanche gracilis Sm. in Trans. Linn. Soc. 4: 172. 1798

= *O. cruenta* Bertol., Rar. It. Pl. Dec. 3: 56. 1810

= *Orobanche grandiuscula* Moris, Diagn. Stirp. Sard. nov.: 2. 1857.

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1780.

First record: Moris (1857) Diagn. Stirp. Sard. nov.: 2.

Hosts: Woody legumes: *Genista corsica* (Loisel.) DC., *Calicotome villosa* (Poir.) Link, *Cytisus villosus* Pourret, etc.

Distribution: Spread in the Sulcis-Iglesiente (S-Sardinia), but in the past collected also near Aritzo, Central Sardinia.

Specimens seen: - Sardinia, 1855, Moris (TO-Moris).- Cagliari, 04.1858, Gennari (TO) - Arizzo, 07.1859, Gennari (FI) - Arizzo, 07.1859, Gennari (TO) - S. Pietro "La Punta", 14.04.1970, Mossa & Mura (CAG) - San Giovanni Suergiu, 30.04.1974, Arrigoni, Mori & Nardi (FI) - Nel ciglio della strada che porta a Chia, 28.03.1989, Zedda (CAG) - Aritzo,



Fig. 2. *Orobanche denudata* Moris (from Moris 1858-1859).

10.06.1989, Arrigoni, Baldini & Ricceri (FI) - Chia, 29.04.2006, Domina (PAL) - Arbus, 30.04.2006, Domina (PAL).

Orobanche hederæ Duby, Bot. Gall.: 350. 1828

= *O. yuccæ* Savi f. ex Bertol., Fl. Ital. 6: 423. 1846

= *O. glaberrima* Guss. ex Reut. in DC., Prodr. 11: 719. 1847

= *O. stenantha* Lojac. in Naturalista Sicil. 2(3): 62. 1882

= *O. hederæ* f. *stenantha* (Lojac.) G. Beck in Biblioth. Bot. 19: 260. 1890

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1803.

First record: Moris (1858-59) Fl. Sard., 3: 256, as extinct on a specimen by Thomas P. in herb. Charp. ex Reuter in DC. Prodr, 11: 28, but subsequently confirmed by Gennari (1890).

Hosts: *Hedera helix* L.

Distribution: Quite common in the whole island, especially in mountainous areas.

Specimens seen: Arizzo, 07.1859, Gennari (FI) - In horti marchese de Laconi, 25.06.1863, Ascherson (FI) - Laconi, misit 1866, Gennari (FI) - Sardinia, 06.1888, Cansella (FI) - Nuoro a monte Ortobene, 10.06.1894, Martelli (FI) - Tempio Pausania, 31.05.1964, Arrigoni (FI) - Oliena, sorgenti del Gologone, 20.06.1972, Arrigoni & Nardi (FI) - Orgosolo, Sopramonte: lecceta di Su Disterru, 22.06.1972, Arrigoni & Nardi (FI) - Orgosolo, foresta Montes, 23.06.1972, Arrigoni & Nardi (FI) - Seui, foresta di Montarbu, 27.06.1972, Arrigoni & Nardi (FI) - Urzulei, da Planu Campu Oddeu a S'Azza bianca, 29.06.1973, Arrigoni & Di Tommaso (FI) - Orgosolo, foresta demaniale di Funtana Bona, 05.07.1973, Paoli (FI) - Sopramonte, 27.05.1980, Arrigoni & Di Tommaso (FI) - Tumberino, is. Asinara, Porto Torres (Sassari), 16.5.1984, Bocchieri (CAG); Riu Tronau, Arbus (Cagliari) - Oliena Orgosolo, monte Novo S. Giovanni, 08.07.1985, Arrigoni & al. (FI) - 5.5.2003, Bacchetta & al. (CAG); nei pressi di Montevecchio, strada per M.te Majore, Arbus (Cagliari), 10.5.2003, Pontecorvo, Vacca & Furcas (CAG); Mularza Noa, 02.06.2003, Domina (PAL).

Orobanche lavandulacea Rchb., Pl. Crit. 7: 48. 1829

≡ *Kopsia lavandulacea* (Rchb.) Caruel in Parl., Fl. Ital. 6: 357. 1884

≡ *Phelipanche lavandulacea* (Rchb.) Pomel in Bull. Soc. Sci. Phys. Algérie 11: 106. 1874

≡ *Phelipaea lavandulacea* (Rchb.) Reut. in DC., Prodr. 11: 7. 1847

= *Orobanche lavandulacea* f. *crassipes* G. Beck in Biblioth. Bot. 19: 106. 1890

– *O. caerulea* var. *ramosa* C. Presl, Fl. Sic. 1: XXXIV. 1826) [Nom. nud.]

Icon.: Reichenbach (1829) Pl. Crit. 7: tav. 935.

First record: Reported by Béguinot (1902) as likely occurring in the region.

Hosts: *Bituminaria bituminosa* (L.) C.H. Stirt.

Distribution: Rare: Basaltic rocks of Mount S. Elena (Dorgali). Also reported from the Tonneri di Seui, at Rio S. Lucia and in Mount Arcosu, in the Sulcis, but to be confirmed.

Specimens seen: Dorgali, Rocce basaltiche di M. S. Elena, 22.05.1980, Nardi & Ricceri (FI).

Orobanche litorea Guss., Fl. Sicul. Prod. 2: 184. 1828

≡ *O. minor* var. *litorea* (Guss.) Bég. in Fiori & Paol., Fl. Anal. Ital. 2(3): 484. 1902

= *O. angeilcifixia* Péteaux & St. Lager in Ann. Soc. Bot. Lyon 27: 221. 1890

= *O. fuliginosa* Jord., Observ. Pl. Nouv. 3: 225. 1846

= *O. sabulicola* Lojac. in Naturalista Sicil. 2(3): 61. 1882

– *O. littoralis* Lojac. in Naturalista Sicil. 2(2): 37. 1882

Icon.: In Jordan (1846) Observ. Pl. Nouv.: Pl. 9B.

First record: Beck (1930) from Ingurtosu, on exsiccata by Magnus sub *O. fuliginosa*.

Hosts: *Compositae* and *Apiaceae*: *Helichrysum italicum* (Roth) G. Don, *Inula crithmoides* L., *Eryngium maritimum* L., etc.

Distribution: Coastal areas: Maddalena islands, Tavolara, S. Antioco and S. Pietro; coast of the Sinis and of Sulcis-Iglesiente.

Specimens seen: Sardegna, misit 1829, Moris (TO) - Isola di Tavolara, 21.05.1885, Forsyth Major (TO) - Castelsardo, 1829, Viviani (BOLO) - Isola S. Pietro, 02.05.1894, Martelli (FI) - Isola Maddalena, 05.1893, Vaccari (FI) - Iglesias, spiaggia di Fontanamare, 29.05.1966, Moggi & Ricceri (FI) - Isola di S. Pietro fra Cala Lunga e Punta delle Oche, 09.05.1967, Arrigoni & Ricceri (FI) - Arbus, dune litoranee fra Portu de Maga e punta S'acquedda, 08.05.1969, Arrigoni & Ricceri (FI) - Cabras, costa del Sinis a sud di Putzu Idu, 02.06.1970, Arrigoni & Raffaelli (FI); Chia, Domus de Maria (Cagliari), 04.05.1994, s.d. (CAG) - Carloforte: coste a ovest de la Punta, 12.05.2005, Arrigoni & Ferretti (FI) - S. Antioco: coste tra Cala Sapone e i Ciclopi, 13.05.2005, Arrigoni & Ferretti (FI) - Olbia alle saline, 27.04.2006, Domina (PAL) - Capo Ferrato, 29.04.2006, Domina (PAL).

Note: Included in *O. minor* (Beck 1890), this taxon has recently revalued at the specific rank (Domina & Mazzola 2004) owing to the shape of the calyx and of the corolla.

Orobanche minor Sm. in Sowerby, Engl. Bot.: tab. 422. 1797

= *O. minor* var. *pumila* (Kock & Bég. in Rchb. f.) Bég. in Fiori & Paol., Fl. Anal. Ital., 2(3): 484. 1902

= *O. crithmi* Bertol., Fl. Ital., 6: 425. 1846

= *O. chritmi maritimi* F. W. Schultz in Ann. Gew. Regensb. 5: 500. 1830

= *O. minor* var. *crithmi-maritimi* (F. W. Schultz) Bég. in Fiori & Paol., Fl. Anal. Ital., 2: 484. 1902

= *O. barbata* var. *crithmi-maritimi* (F. W. Schultz) Fiori, Nuova Fl. Anal. Ital.: 2: 390. 1926

Icon.: Reichenbach (1862) Icon. Fl. Germ., 20: tav. 1804.

First record: Moris (1827).

Hosts: Generalist, on *Compositae*, *Leguminosae*, *Lamiaceae*, etc.: *Urospermum dalechampii* (L.) Schmidt., *Galactites tomentosa* Moench, *Helichrysum stoechas* (L.) Moench, *H. italicum* (Roth) Don, *Carlina lanata* L., *Hypochoeris achyrophorus* L., *Reichardia picroides* (L.) Roth, *Vicia* sp.pl., *Psoralea morisiana* Pignatti & Metlesics, *Glechoma sardoa* Bég., etc.

Distribution: Common in the whole island.

Specimens seen: Portotorres, s.d., Nicotra (B) - Cagliari, 04.1858, Gennari (TO) - Cagliari, 04.1858, Gennari (FI) - Sopra Capoterra, 05.1862, Gennari (TO) - Cagliari,

29.05.1863, Ascherson (FI) - Piscinas, 16.06.1963, Ascherson (FI) - Aritzo, 27.06.1863, Ascherson (FI) - Aritzo, 29.06.1863, Ascherson (FI) - Cagliari, 12.05.1872, Sommier (FI) - Santa Teresa di Gallura, Tempio, 12.05.1881, Reverchon (PRC, TO) - Capo Caccia, 05.05.1884, Forsyth Mayor (FI) - Isola di Tavolara, 23.05.1885, Forsyth Major (FI) - Isola S. Pietro, 02.05.1894, Martelli (FI) - Sassari a S. Anatolia, 09.05.1895, Martelli (FI) - Nuoro a monte Ortobene, 10.06.1895, Martelli (FI) - Contorni di Ala dei Sardi, 10.06.1899, Martelli (FI) - S. Anna Arresi, Porto Pino, 18.05.1963, Arrigoni (FI) - Sarcidano, pianoro sopra S'Atza de Ziu Chiccu, 21.05.1963, Bavazzano & Ricceri (FI) - Iglesiasiente, Masua (Nedbida), 29.05.1966, Moggi & Ricceri (FI) - Codula di Luna (Golfo di Orosei), 30.05.1966, Moggi & Ricceri (FI) - Isola dell'Asinara, 28.05.1968, Barba (FI) - Urzulei, Codula di Luna, 30.05.1968, Arrigoni & Ricceri (FI) - Monte Gennargentu, Bruncu Spina, 23.07.1968, Arrigoni & Ricceri (FI) - Aritzo, 24.07.1968, Arrigoni (FI) - Tertenia, dune litoranee di Sa Foxi Manna, 10.05.1969, Arrigoni & Ricceri (FI) - Tempio Pausania, monte Limbara loc. Frati Mendula, 26.06.1969, Arrigoni (FI) - Iglesias, monte Margana, 04.07.1969, Arrigoni (FI) - Urzulei, costa Silana sopra la Cantoniera di Genna Silana, 28.05.1970, Arrigoni & Raffaelli (FI) - Monti del Gennargentu, Su Sciusciu, 12.07.1970, Arrigoni (FI) - Baunei, Cala Luna, 27.04.1971, Arrigoni & Nardi (FI) - Seui, foresta Montarbu, 20.06.1971, Arrigoni & Ricceri (FI) - Lula, monte Albo, 21.06.1972, Arrigoni & Nardi (FI) - Orgosolo, 23.06.1972, Arrigoni & Nardi (FI); Lula, monte Albo, 16.06.1972, Leoni (FI) - Monte Gennargentu, da Arcu S'Arena a rifugio Lamarmora, 07.07.1972, Arrigoni & Nardi (FI) - Urzulei, 29.06.1973, Arrigoni & Di Tommaso (FI); San Giovanni Suergiu, 30.04.1974, Arrigoni, Mori & Nardi (FI) - Isola dei Cavoli, 10.5.1975, Mossa (CAG) - Isola dei Cavoli, 21.7.1975, Mossa (CAG) - Dorgali, 27.05.1980, Nardi & Ricceri (FI) - Baunei, loc. Gorropeddu, 27.05.1982, Arrigoni, Di Tommaso & Mazzanti (FI) - Dorgali, Cala Luna, 20.05.1984, Arrigoni, Ricceri & Rizzotto (FI) - Urzulei, 29.06.1984, Arrigoni (FI) - Dorgali, loc. Ghivine, 30.06.1984, Arrigoni (FI) - Desulo, monte Gennargentu, 05.07.1985, Arrigoni & al. (FI) - Isola su Cardulinu, Domus de Maria (Cagliari), 24.05.1986, Bocchieri (CAG) - Aritzo, Funtana Orrubia, 13.06.1986, Arrigoni (FI) - Aritzo, 15.06.1986, Arrigoni (FI) - Isola di San Macario, 30.10.1986, Bocchieri (B) - Monte Arcosu, 4.1987, Angiolino (CAG) - Isola di Reulino, 17.5.1988, Bocchieri (B) - S'Ega is Tirias, Isola di S. Antioco (CA), 11.04.1992, Mossa (CAG) - "Scaralettus", S. Antioco (CA), 30.04.1992, Mossa (CAG) - Gutturu Mannu, Schina Ludragus Assemini (Cagliari) 11.04.1993, Bacchetta (CAG) - Is Tavolara, Olbia (Sassari), 6.1995, Bocchieri (CAG) - Monte Arrubiu, Capoterra (Cagliari), 13.04.2000, Bacchetta & Sotgiu-Cocco (CAG) - Laveria Sanna, Montevecchio, Guspini (Cagliari), 10.5.2003, Casti, Piras & Zavattero (CAG) - Mularza Noa, 02.06.2003, Domina (PAL) - Uta, 14.05.2004, Arrigoni (FI) - Olbia, 15.05.2004, Arrigoni (FI) - Cuglieri, 26.04.2006, Domina (PAL) - Ittiri, 27.04.2006, Domina (PAL) - Olbia, 27.04.2006, Domina (PAL) - San Teodoro, 27.04.2006, Domina (PAL) - Villa Putzu, 28.04.2006, Domina (PAL) - Villasimius, 28.04.2006, Domina (PAL) - Costa Rei, 29.04.2006, Domina (PAL) - Villacidro, 30.04.2006, Domina (PAL) - Piscinas, 30.04.2006, Domina (PAL) - Guspini, 30.04.2006, Domina (PAL) - Castiadas, 29.09.2006, Domina (PAL).

Orobanche mutelii F. W. Schultz in Mutel, Fl. Franç., 2: 353. 1835

≡ *O. ramosa* subsp. *mutelii* (F. W. Schultz) Coutinho, Fl. Portugal: 566. 1913

≡ *O. ramosa* var. *mutelii* (F. W. Schultz) Fiori, Nuova Fl. Anal. Ital., 2: 379. 1926

≡ *Kopsia ramosa* subsp. *mutelii* (F. W. Schultz) Arcangeli, Comp. Fl. Ital., ed. 2: 417. 1894

≡ *Phelypaea ramosa* subsp. *mutelii* (F. W. Schultz) Rouy in Bull. Soc. Bot. France, 55: 549. 1908

= *O. mutelii* var. *interjecta* G. Beck in Biblioth. Bot. 19: 98. 1890

= *O. mutelii* var. *angustiflora* G. Beck in Biblioth. Bot. 19: 96. 1890

= *Kopsia mutelii* var. *angustiflora* (G. Beck) Bég. in Fiori & Paol., Fl. Anal. Ital., 2(3): 472. 1902

= *O. mutelii* f. *emarginata* G. Beck in Biblioth. Bot. 19: 98. 1890

= *O. mutelii* var. *ramosissima* Lojac., Contr. Fl. Sicil.:16. 1878

= *P. ramosissima* Genn., Sp. Var. Fl. Sard.: 10. 1866

= *P. elongata* Lojac. in Natural. Sicil., 2: 133. 1883

= *P. panormitana* Lojac. in Natural. Sicil., 1(8): 174. 1883

= *P. ramosa* subsp. *spissa* (G. Beck) Rouy in Bull. Soc. Bot. France, 55: 549. 1908

= *P. concolor* Moris, Diagn. Stirp. Sard. Nov.: 3. 1857

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1771.

First record: Moris (1857)

Hosts: Mainly on *Compositae*.

Distribution: Scattered, in the whole island.

Specimens seen: Monti sopra Orri, 05.1858, Gennari (FI) - Isola Maddalena, 04.1893, Vaccari (FI) - Sassari a S. Anatolia, 09.05.1895, Martelli (FI) - Pixinamanna, 15.05.1962, Arrigoni (FI) - Siniscola, Monte Albo, 30.05.1970, Arrigoni & Raffaelli (FI) - Laconi, altipiano del Sarcidano, 01.06.1970, Arrigoni & Raffaelli (FI).

Orobanche nana (Reuter) G. Beck in Biblioth. Bot. 19: 91. 1890

≡ *O. ramosa* subsp. *nana* (Reuter) Coutinho, Fl. Portugal.: 566. 1913

≡ *O. ramosa* var. *nana* (Reuter) Bég. in Fiori & Paol., Fl. Anal. Ital., 2: 471. 1902

≡ *Phelypaea mutelii* var. *nana* Reut. in DC. Prodr., 11: 9. 1847

≡ *Phelipanche nana* (Reuter) Soják in Cas. Nár. Muz. Prir., 140: 130. 1972

≡ *Kopsia nana* (Reuter) Freyn in Verh. Zool.-Bot. Ges. Wien, 38(2): 623. 1888

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1772.

First record: Béguinot (1902).

Hosts: *Leguminosae*, *Compositae* (*Chrysanthemum coronarium* L., *Anthemis arvensis* L.) and occasionally on *Rubiaceae* (*Sherardia arvensis* L.), *Lamiaceae* (*Glechoma sardoa* Bég.), etc.

Distribution: Spread in almost all the region, from the La Maddalena archipelago to the Sulcis-Iglesiente Mountains.

Specimens seen: Oristano, s.d., Moris (TO) - Monte Arcosu, s.d., Corrias & Floris (CAG) - Pascoli della Baronia di Orosei, 05.1852, Moris (TO) - Cagliari nelle saline, 04.1863, Moris (TO) - Lanusei, 20.05.1864, Moris (TO-Moris) - Cagliari, 11.04.1872, Sommier (FI) - Monte Narba, Sarrabus, 21.04.1872, Sommier (FI) - Tempio, 18.05.1882, Reverchon (TO) - Isola S. Antioco, 03.1890, Vaccari (FI) - Isola S. Pietro, 02.05.1894, Martelli (FI) - Isola Tavolara, 24.05.1895, Forsyth Major (FI, TO) - Tempio alla base del Limbara,

04.06.1895, Martelli (FI) - Lula, 10.06.1899, Martelli (FI) - Spiaggia di Porto Torres, 17.03.1912, Fiori (FI) - Cagliari alla Scafa, 21.03.1912, Fiori (FI) - Bosa, 30.03.1912, Fiori (FI) - Monte Ferro, misit 1914, Siemoni (FI) - Dorgali, Monte Tuttavista, 24-25.04.1953, Piroddi & Martinoli (CAG) - Dorgali, Monte Tuttavista, 10.05.1954, Piroddi (CAG) - Pixinamanna, 04.04.1960, Arrigoni (FI) - Pixinamanna, 05.1961, Arrigoni (FI) - Laconi, 17.05.1967, Alias (FI) - Monte Gennargentu, Bruncu Spina, 23.07.1968, Arrigoni (FI) - Dorgali, Regione Planus, 02.05.1969, Arrigoni & Ricceri (FI) - Dorgali, 02.05.1969, Arrigoni & Ricceri (FI) - Alghero, 05.05.1969, Arrigoni & Ricceri (FI) - Baunei, 11.05.1969, Arrigoni & Ricceri (FI) - Dorgali, monte Tului, 12.05.1969, Arrigoni & Ricceri (FI) - Dorgali, 03.04.1970, Arrigoni & Ricceri (FI); Baunei, 08.04.1970, Arrigoni & Ricceri (FI) - Dorgali, Calagonone, 28.05.1970, Arrigoni & Raffaelli (FI) - Dorgali, cava di Ischirtiore, 28.04.1971, Arrigoni & Nardi (FI) - Dorgali Regione Toddeitto, 28.04.1971, Arrigoni & Nardi (FI) - Dorgali, 01.05.1971, Arrigoni & Nardi (FI) - S. Pietro, 05.05.1971, Mossa & Mura (CAG) - Seui, 21.06.1971, Arrigoni & Ricceri (FI) - Lula, monte Albo, 21.06.1972, Arrigoni & Nardi (FI) - Lula, monte Albo, 21.06.1972, Leoni (FI) - Seui, foresta di Montarbu, 27.06.1972, Arrigoni & Nardi (FI) - Urzulei, 29.06.1973, Arrigoni & Di Tommaso (FI) - Orgosolo, 05.07.1973, Paoli (FI) - Orgosolo, 07.07.1973, Arrigoni, Sartoni & Di Tommaso (FI) - Dorgali, 12.06.1977, Arrigoni & Di Tommaso (FI) - Dorgali, Regione Margheddie, 12.05.1979, Arrigoni, Di Tommaso, Ricceri (FI) - Dorgali, Ramenas, 15.05.1979, Arrigoni, Di Tommaso & Ricceri (FI) - Dorgali, S'Atticcheddas, 15.05.1979, Arrigoni, Di Tommaso & Ricceri (FI) - Dorgali, 15.05.1979, Arrigoni, Di Tommaso, Ricceri (FI) - Calamosca (Ca), 09.04.1980, Zedda (CAG) - Monte Linas, 13.07.1980, Angiolino (FI) - Monte Linas (Cagliari), 4.1984, Angiolino & Chiappini (CAG) - Dorgali, Cala Gonone, 17.05.1984, Arrigoni, Ricceri & Rizzotto (FI) - Villagrande Strisaili, 06.07.1985, Arrigoni & al. (FI) - Monti del Sud (Cagliari), 02.05.1987, Angiolino (CAG) - Monte S.ta Barbara, versante SE, Capoterra (Cagliari), 16.04.1989, Bacchetta (CAG) - Gennargentu, 30.06.1989, Scrugli & Bocchieri (CAG) - Laconi, 09.06.1989, Arrigoni, Baldini & Ricceri (FI) - Gutturu Mannu, Assemini (Cagliari), 11.04.1993, Bacchetta (CAG) - Gutturreddu, Uta (Cagliari), 11.04.1993, Bacchetta (CAG) - Le Saline, Calasetta, Isola di S. Antioco (Cagliari), 30.04.1993, Mossa (CAG) - Isola di Tavolara, 19.05.1994, Arrigoni (FI) - Rio Is Sarpas, Pula (Ca), 21.05.1998, Bacchetta (CAG) - Monte Arrubiu, Capoterra (Ca), 13.04.2000, Bacchetta & Sotgiu-Cocco (CAG) - Mularza Noa, 02.06.2003, Domina (PAL) - Uta, 14.05.2004, Arrigoni (FI) - S. Antioco, 13.05.2005, Arrigoni & Ferretti (FI) - Badde Salighes, 02.06.2004, Aedo & al. (MA) - Milis, 26.04.2006, Domina (PAL).

Orobanche picridis F. W. Schultz in Ann. Gew. Regensb. 5: 504. 1830

≡ *O. loricata* var. *picridis* (F. W. Schultz) Bég. in Fiori & Paol., Fl. Anal. Ital., 2: 483. 1902

= *O. picridis* var. *carotae* (Des Moulins) G. Beck in Biblioth. Bot. 19: 246. 1890

= *O. ambigua* Moris, Diagn. Stirp. Sard.: 2. 1857

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1796.

First record: Moris (1857) sub *O. ambigua*.

Hosts: *Asteraceae* and *Apiaceae*: *Hedynnois cretica* (L.) Willd., *Picris echioides* L., *Daucus carota* L.

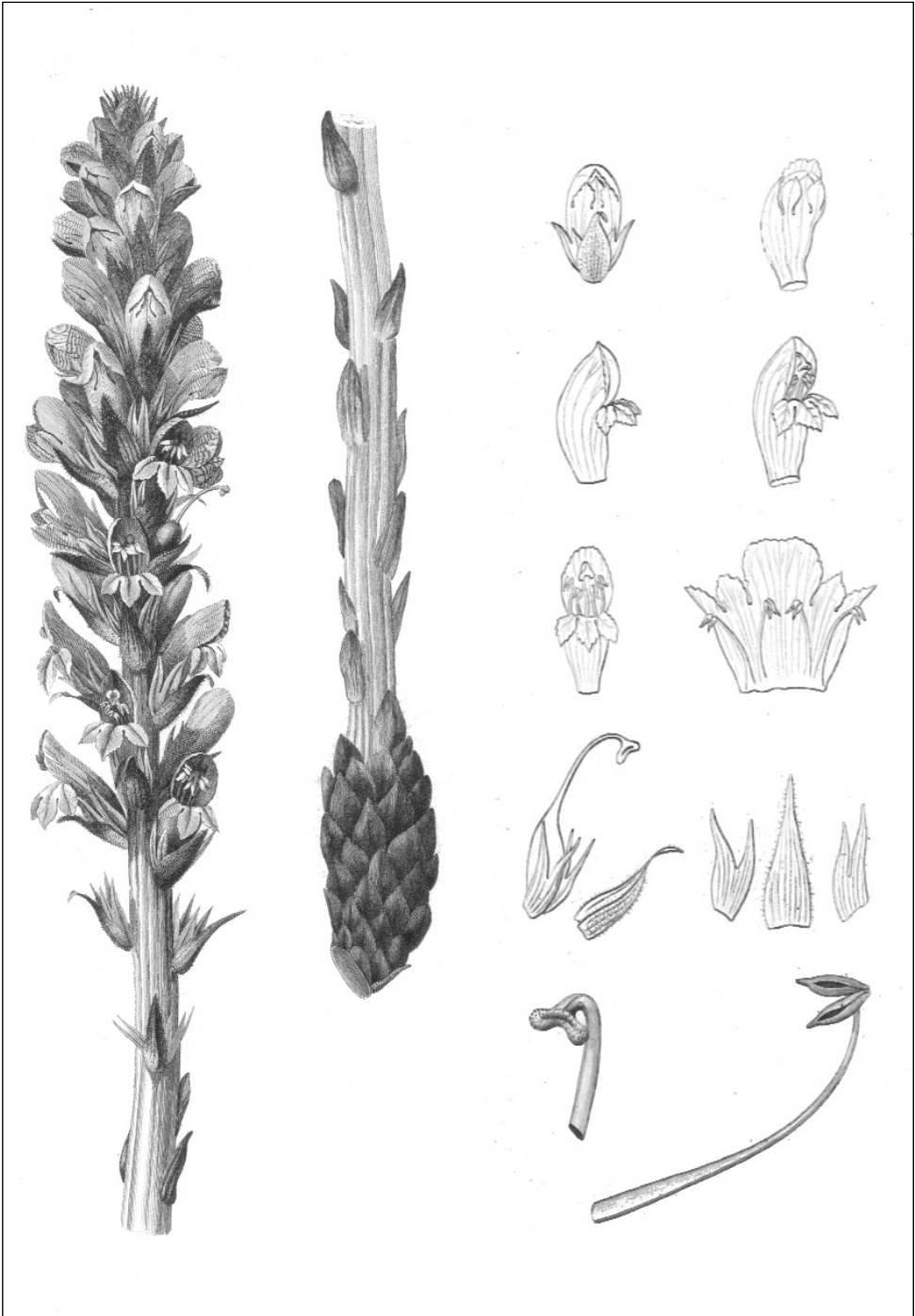


Fig. 3. *Orobanche rigens* Loisel. (from Moris 1858-1859).

Distribution: Rare, occurring scattered in the whole island.

Specimens seen: - S. Pietro, Sassari, 19.05.1880, Macchiati (RO-HG) - Isili, 15.05.1894, Martelli (FI) - Buggerru, 15.05.1967, Arrigoni & Ricceri (FI) - Laconi, 24.05.1968, Alias (FI) - Lula, monte Albo, 10.05.1972, Leoni (FI) - Seui, 27.06.1972, Arrigoni & Camarda (FI) - Monti del Sud (Cagliari), 30.05.1987, Angiolino (CAG) - Laconi, garighe sull'altipiano del Sarcidano, 09.06.1989, Arrigoni, Baldini & Ricceri (FI) - Uta, 14.5.2004, Arrigoni (FI) - Alghero, 26.04.2006, Domina (PAL).

Orobanche pubescens d'Urv. in Mem. Soc. Linn. Paris: 332. 1822

= *O. versicolor* F. W. Schultz, Flora 26: 129. 1843

= *O. campuliflora* (Lojac.) Lojac., Fl. Sic. 2(2): 170. 1904

= *O. pubescens* var. *campuliflora* Lojac. in Naturalista Sicil., 2(4): 82. 1883

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1801.

First record: Vaccari (1908).

Hosts: *Compositae*: *Galactites tomentosa* Moench, *Carlina sicula* Ten., *Hyoseris radiata* L.

Distribution: Uncommon.

Specimens seen: Isola Maddalena, 05.1896, Vaccari (FI) - Monte Linas (Cagliari), 4.1984, Angiolino & Chiappini (CAG).

Orobanche ramosa L., Sp. Pl.: 633. 1753

≡ *Kopsia ramosa* (L.) Dum., Comm. Bot.: 16. 1822

= *O. ramosa* f. *polyclonos* Wallr., Orobanches Gen. Diask.: 64. 1825

= *K. ramosa* f. *polyclonos* (Wallr.) Bég. in Fiori & Paol., Fl. Anal. Ital. 2(3): 471. 1902

= *O. mutelii* var. *ramosissima* Gennari in Cesati, Pass. & Gibelli, Comp. Fl. Ital.: 335. 1883

= *Phelypaea albiflora* Gren. & Godr., Fl. Fr., 2: 627-628. 1850

= *P. emarginata* Reut. in DC., Prodr., 11: 9. 1847

= *P. olbiensis* Cosson, Not. Pl. Crit., 1: 8. 1849

= *P. reuterii* Moris, Fl. Sard. 3: 243. 1858-1859

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1773.

First record: Moris (1827), but omitted in Fl. Sard. (1858-59). Once again recorded by Béguinot (1902).

Hosts: *Leguminosae*, *Compositae* and occasionally other families.

Distribution: Along the coast and in the inland. Uncommon.

Specimens seen: Dorgali, 06.1852, Moris (TO) - Cagliari, 04.1858, Gennari (TO) - Cagliari, 04.1859, Gennari (TO) - Saline S. Pietro, 05.1863, Gennari (TO) - S. Antioco (Cannai), 10.05.1975, Milia & Mossa (CAG) - Monte Linas, 06.1984, Chiappini & Angiolino (CAG) - Alghero, 26.04.2006, Domina (PAL).

Orobanche rapum-genistae Thuill., Fl. Env. Paris, ed. 2: 317. 1799

= *O. rapum* Wallr., Orobanches Gen. Diask.: 32. 1825

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1778.

First record: Moris (1827) sub *O. major* Sutton non L., corrected in *O. rapum* Thuill. in Fl. sard. (Moris 1858-59).

Hosts: *Genista aetnesis* (Biv.) DC., *Genista sulcitana* Valsecchi and other woody *Leguminosae*.

Distribution: Uncommon, it occurs scattered from North to South of the island.

Specimens seen: Sardinia, misit 1828, Moris (BOLO) - Monte Tonneri prope Aritzo, 28.06.1863, Ascherson (FI) - Orune, 05.1899, Martelli (FI) - Ozieri, 26.05.1970, Arrigoni & Raffaelli (FI) - Nughedu di S. Nicolò, Riu e Canna, 26.05.1970, Arrigoni & Raffaelli (FI) - Monte d'Oliena, 14-15.06.1975, Putzu (FI) - Badde Salighes, 03.06.1981, Malicky (W) - Rio Piscinas, Arbus, 26.05.1987, Scrugli & Cogoni (FI) - Isola di Tavolara, 19.05.1994, Arrigoni (FI) - Piscinas, 30.04.2006, Domina (PAL) - Villacidro, 30.04.2006, Domina (PAL).

Orobanche rigens Loisel., Fl. Gall.: 384. 1807 (Fig. 3)

≡ *Orobanche rapum* subsp. *rigens* (Loisel.) Arcang., Comp. Fl. Ital.: 524. 1882

≡ *Orobanche rapum-genistae* subsp. *rigens* (Loisel.) P. Fourn., Quatre Fl. France: 796. 1937

= *O. thyrsioidea* Moris ex Bertol., Fl. Ital. 6: 428. 1846

Icon. - In Moris (1858-1859) Fl. Sard. 3: tav. 103.

First record: Moris (1858-59) sub *O. thyrsioidea* Bertol.

Hosts: *Genista corsica* (Loisel.) DC., *G. sulcitana* and others woody *Leguminosae*.

Distribution: Endemic to Sardinia and Corse (Beck 1930; Camarda 1982), reported from Sicily (Beck 1930) probably by mistake. Spread from the sea level to the top of mountains.

Specimens seen: in silvos montium, s.d., Moris (TO) - Sardinia, s.d., Moris (RO-HC) - Sardinia, misit 1828, Moris (BOLO) - Isola della Maddalena, 1837, Moris (TO) - Sardinia, misit 1846, Moris (BOLO) - Monti di Orgosolo, 07.1852, Moris (TO) - Sardegna, misit 03.1853, Moris, (FI) - Capo S. Elia, 04.1858, s.c. (CAG) - Capo S. Elia, 04.1858, Gennari (TO) - Caprera, 05.1861, Gennari (CAG) - S. Elia, in collibus maritimis, 11.04.1872, Sommier (FI) - Capo S. Elia, 04.1878, Gennari (FI) - Serra secca, Sassari, 09.05.1881 Macchiati (RO-HG) - Insula Tavolara, 21.05.1885, Forsyth Major (FI, TO) - Limbara, 13-16.06.1895, Martelli (FI) - Orune, 5.1899, Martelli (B) - Monte Limbara, 06.1908, Cavara (PRC) - Iglesiente, Gonnosfanadiga, 19.05.1963, Bavazzano & Ricceri (FI) - Tempio Pausania, monte Limbara, Vallicciola, 25.05.1968, Filigheddu G. (FI) - Tempio Pausania, monte Limbara, Frati Mendula, 26.06.1969, Arrigoni (FI) - Monte Gennargentu, pascoli da Bruncu Spina a Punta Paolina, 06.07.1969, Arrigoni (FI) - Gennargentu, pendici sud da Genna Aragas a Bruncu Allasi, 12.07.1970, Arrigoni (FI) - Fonni, 23.06.1971, Arrigoni & Ricceri (FI) - Aritzo, 27.06.1971, Arrigoni & Ricceri (FI) - Monte Linas, 04.1972, Angiolino (FI) - Gennargentu, fra Bruncu Spina e Punta Paolina, 05.07.1972, Arrigoni & Nardi (FI) - Gennargentu, 07.07.1972, Arrigoni & Nardi (FI) - Monte Linas, 13.07.1980, Angiolino (FI) - Punta Crastu Zulurias (S. Lussurgiu), 16.04.1984, Scrugli (FI) - Monte Linas, 06.1984, Angiolino (CAG) - P.ta Crastu Zulurias, 14.06.1984, Scrugli & Zedda (CAG) - Dune di Rio Piscinas, Arbus (Cagliari), 16.05.1987, Scrugli & Cogoni (CAG) - Dune di Rio Piscinas, Arbus, 26.05.1987, Scrugli & Cogoni (FI) - Monte Linas, 21.06.1987, Chiappini & Angiolino (CAG) - Stintino, Capo Falcone, 26.05.1989, Filigheddu & Urbani (SS) - Gennargentu, 30.06.1989, Scrugli & Bocchieri (CAG) - Funtana Cungiada, Aritzo (Nu), 07.07.1989, Scrugli & Cogoni (CAG) - Monte Ortobene (Nu), 05.06.1992, Scrugli & Cogoni (CAG) - Bruncu Spina, Gennargentu (Nu),

01.06.1992, Fogu (CAG) - Tra Genna Eidadi e Punta Cammedda, M. Linas (Cagliari), 08.05.1994, Mossa (CAG) - Monte Arcosu, Uta (Cagliari), 14.05.1994, Bacchetta (CAG) - Tra monte Spada e Bruncu Spina, 18.06.1996, Arrigoni & Di Tommaso (FI) - Serra is Carradoris, Burcei (Cagliari), 02.05.2003, Bacchetta, Iiriti & Sanchez (CAG) - Badde Salighes (Sassari), 02.06.2003, Arrigoni (FI) - Mularza Noa, 02.06.2003, Domina (PAL) - Badde Salighes, 02.06.2004, Aedo & al. (MA) - Monte Arcosu, Uta (Cagliari), s.d., Bacchetta (CAG).

O. sanguinea* var. *crinita (Viv.) Bég., Fl. Anal. Ital. 2:478. 1902

≡ *O. sanguinea* f. *crinita* (Viv.) G. Beck in Biblioth. Bot. 19: 206. 1890

≡ *O. crinita* Viv., Fl. Cors. Prodr.: 11. 1824

– *O. bicolor* Salzm. sec. Moris, Fl. Sard. 3: 249. 1858, pro syn.

Icon.: In Moris (1858-1859) Fl. Sard. 3: tav. 104.

First record: Moris (1858-59).

Hosts: *Lotus* gr. *cytisoides* L.

Distribution: Quite abundant along the coast.

Specimens seen: Portotorres, s.d., Nicotra (B) - Sassari, s.d., Nicotra (FI) - Sardinia, misit 1846, Moris (BOLO) - Santa Teresa di Gallura, 10.05.1881, Reverchon (FI, W, TO) - Sassari, San Simplicio, 1898, Nicotra (RO-HG) - Sassari a Scala di Giocca, 05.05.1895, Martelli (FI) - Nurra di Alghero, dintorni di Cala della Barca, 24.05.1966, Bavazzano & Ricceri (FI) - Mura di Alghero, 18.05.1974, Valsecchi (SS) - San Teodoro d'Oviddè, isola Proratora, 01.05.1983, Ricceri (FI) - Dune oltre lo stagno Spalmadori, Is. Asinara, Torti Torres (Sassari), 18.05.1984, Bocchieri (CAG) - Le saline, Calasetta, Isola di S. Antioco (Cagliari), 30.04.1993, Mossa (CAG) - Porto di Vignola, 27.04.2003, Bieringer (W).

Note: This variety differs from *O. sanguinea* C. Presl var. *sanguinea* by having a denser spike, denser overall hairiness, and floral bracts equalling rather than exceeding the corolla (cfr. Domina & al. 2005).

Orobanche schultzii Mutel, Fl. Franç. 2: 429. 1835 (Fig. 4)

≡ *Kopsia schultzii* (Mutel) Bég. in Fiori & Paol., Fl. Anal. Ital. 2: 472. 1902

= *O. stricta* Moris ex Bertol., Fl. Ital. 6: 450. 1846

= *O. schultzii* f. *stricta* (Bertol.) G. Beck in Biblioth. Bot. 19: 112. 1890

= *O. schultzii* var. *stricta* (Bertol.) Fiori, Nuova Fl. Anal. Ital. 2: 380. 1926

= *K. stricta* (Bertol.) Caruel in Parl., Fl. Ital. 6: 356. 1884

= *K. schultzii* var. *stricta* (Caruel) Bég. in Fiori & Paol., Fl. Anal. Ital. 2: 472 (1902)

= *Phelipaea stricta* (Bertol.) Moris ex Reut. in DC., Prodr., 11: 7. 1847

Icon.: In Moris (1858-1859) Fl. Sard. 3: tav. 102.

First record: Moris (1827) sub *O. coerulea* sensu Moris non Vill (= *O. stricta* Moris).

Hosts: *Compositae* (*Hyoseris radiata* L., *Hypochaeris achyrophorus* L., *Reichardia picroides* (L.) Roth, etc.) and other families: *Apiaceae* (*Ferula nodiflora* fide Gennari! and *Moris!*).

Distribution: Common in almost all the island, excepted of the highest mountains.

Specimens seen: In pascuis Iglesias, 05, Moris (TO) - Muravera, 04, Moris (TO) -

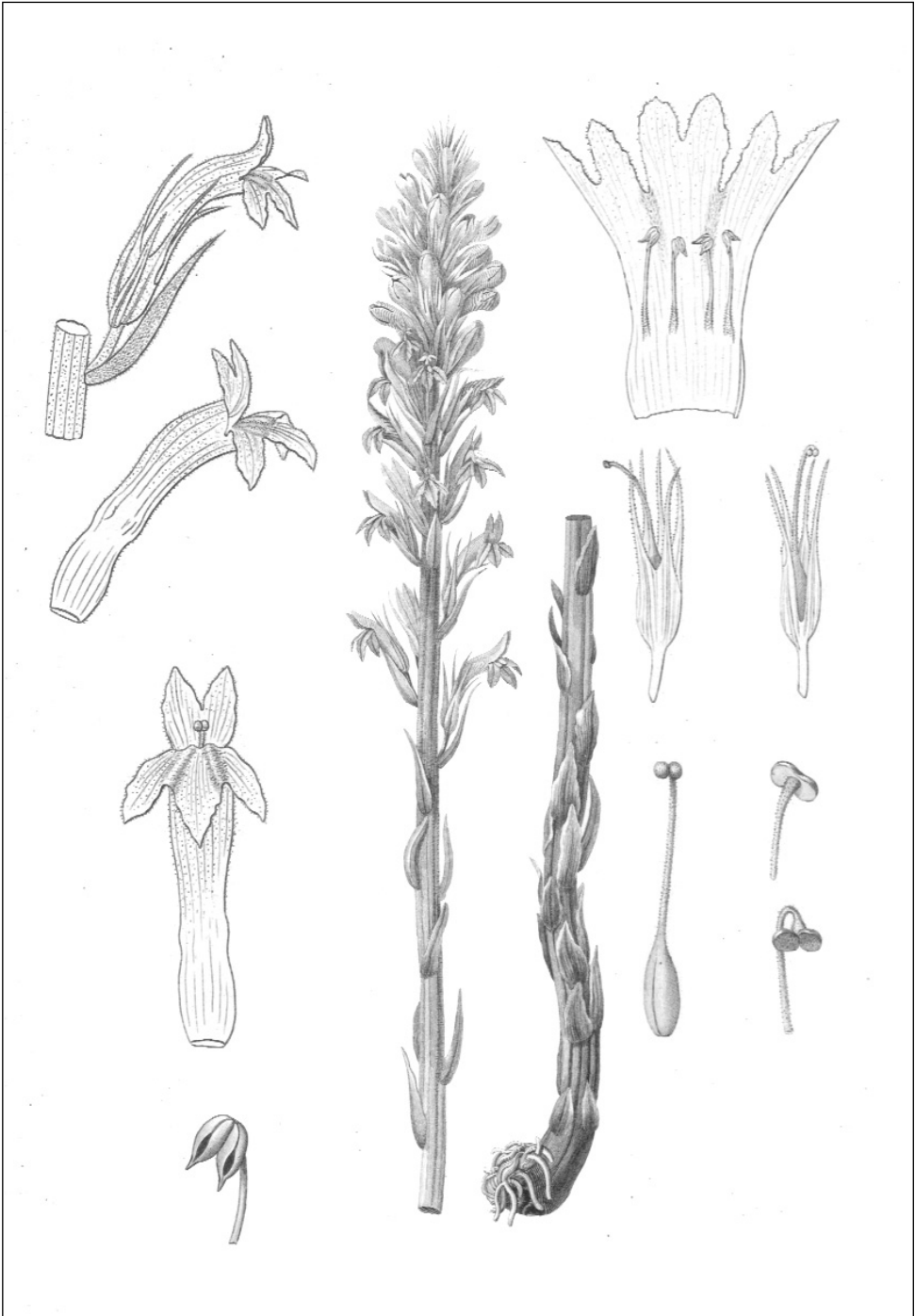


Fig. 4. *Orobanche schultzei* Mutel (from Moris 1858-1859).

Sardinia, misit 1828, Moris (BOLO) - Isole intermedie, 1837, Moris (TO) - Tavolara, 05.1840, Lisa (TO) - Sardinia, misit 1846, Moris (BOLO) - Baronìa d'Orosei, 05.1852, Moris (TO) - Valli di Dorgali, 06.1852, Moris (TO) - Dorgali, 06.1852, Moris (TO) - Sardinia, misit 03.1853, Moris (FI) - Sardinia, misit 1857, Moris (W) - Ozieri, 05.1861, Gennari (TO) - Monti di Capoterra, 05.1863, Gennari (FI) - Isola Maddalena, 12.05.1872, Sommier (FI) - Isola di Tavolara, 23.05.1885, Forsyth Major (FI, TO) - Orune, 05.1899, Martelli (FI) - Isola Maddalena, 05.1893, Vaccari (FI) - Capo Spartivento, Golfo di Malfitano, 18.04.1894, Martelli (FI) - Monti di Capoterra, 05.1897, Gennari (TO) - Isola Maddalena, 05.1904, Vaccari (FI) - Iglesiente, Domusnovas, Grotta di San Giovanni, 17.05.1963, Bavazzano & Ricceri (FI) - S. Anna Arrexi, Porto Pino, 18.05.1963, Arrigoni (FI) - Dorgali, Regione Toddeitto, 28.04.1971, Arrigoni & Nardi (FI) - Dorgali alla cava Ischirtiore, 28.04.1971, Arrigoni & Nardi (FI) - Seui, foresta Montarbu, 22.06.1971, Arrigoni & Ricceri (FI) - Lula, monte Albo, 16.05.1972, Leoni (FI) - Orgosolo, 24.06.1972, Arrigoni & Nardi (FI) - Dorgali sotto monte Tolui, 09.06.1977, Arrigoni & Di Tommaso (FI) - Isola Soffi, 20.04.1979, Mossa (CAG) - Baunei, loc. L'Aguglia, 26.05.1982, Arrigoni & Mazzanti (FI) - Urzulei, 29.05.1982, Arrigoni (FI) - Dorgali, Cala Gonone, 17.05.1984, Arrigoni & Ricceri (FI) - Dorgali, 02.07.1984, Arrigoni (FI) - Monte Arcosu, 05.1987, Angiolino & Zedda (CAG) - Riola Sardo, 28.05.1988, Arrigoni, Foggi & Ricceri (FI) - Monte Arcosu, Uta (Cagliari), 14.05.1994, Bacchetta (CAG) - Rio di monte Nieddu, Villa San Pietro (Cagliari), 28.04.2003, Bacchetta & al. (CAG) - Baunei, 05.06.2003, Aedo & al. (MA); Perdas de Fogu, 06.06.2003, Domina (PAL) - Chia, 29.04.2006, Domina (PAL).

Orobanche teucrii Holandre, Fl. Moselle 2: 322. 1829 (Fig. 5)

= *O. atrorubens* F. W. Schultz in Flora 23: 128. 1840

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1790.

First record: New to the island.

Hosts: probably on *Teucrium chamaedrys* L., *T. scodonia* L. and *T. montanum* L., but still to be confirmed.

Distribution: Very rare. On calcareous mountains in Central Sardinia.

Specimens seen: Lula, Monte Albo, punta Turuddò, 16.06.1972, Leoni (FI) - Seui, Foresta Montarbu al Fundu dei Tonneri, 27.06.1972, Arrigoni & Nardi (FI) - Orgosolo, Rupi tra Sa Pruna e Sos Cuzzos, 07.07.1973, Arrigoni, Sartoni & Di Tommaso (FI).

Note: A Central European species, occurring from the Pyrenees to the Carpathian mountains, northward to Belgium, southward to north-eastern Spain, Italy (Alps and Tuscany) and Rumania. Its discovery in Sardinia is a southward extension of its distribution range.

Orobanche variegata Wallr., Orobanches Gen. Diask.: 40. 1825

= *O. purpurea* Raf., Caratt.: 80. 1810 (non Jacq. 1762)

= *O. grandiflora* C. Presl, Fl. Sicul. 1: xxxiv. 1826

= *O. condensata* Moris, Stirp. Sard. Elench. 2: 8. 1827

= *O. speciosa* Moris, Stirp. Sard. Elench. 1: 35. 1827 (non DC.)

= *O. satyrus* De Not., Repert. Fl. Ligust.: 305. 1844

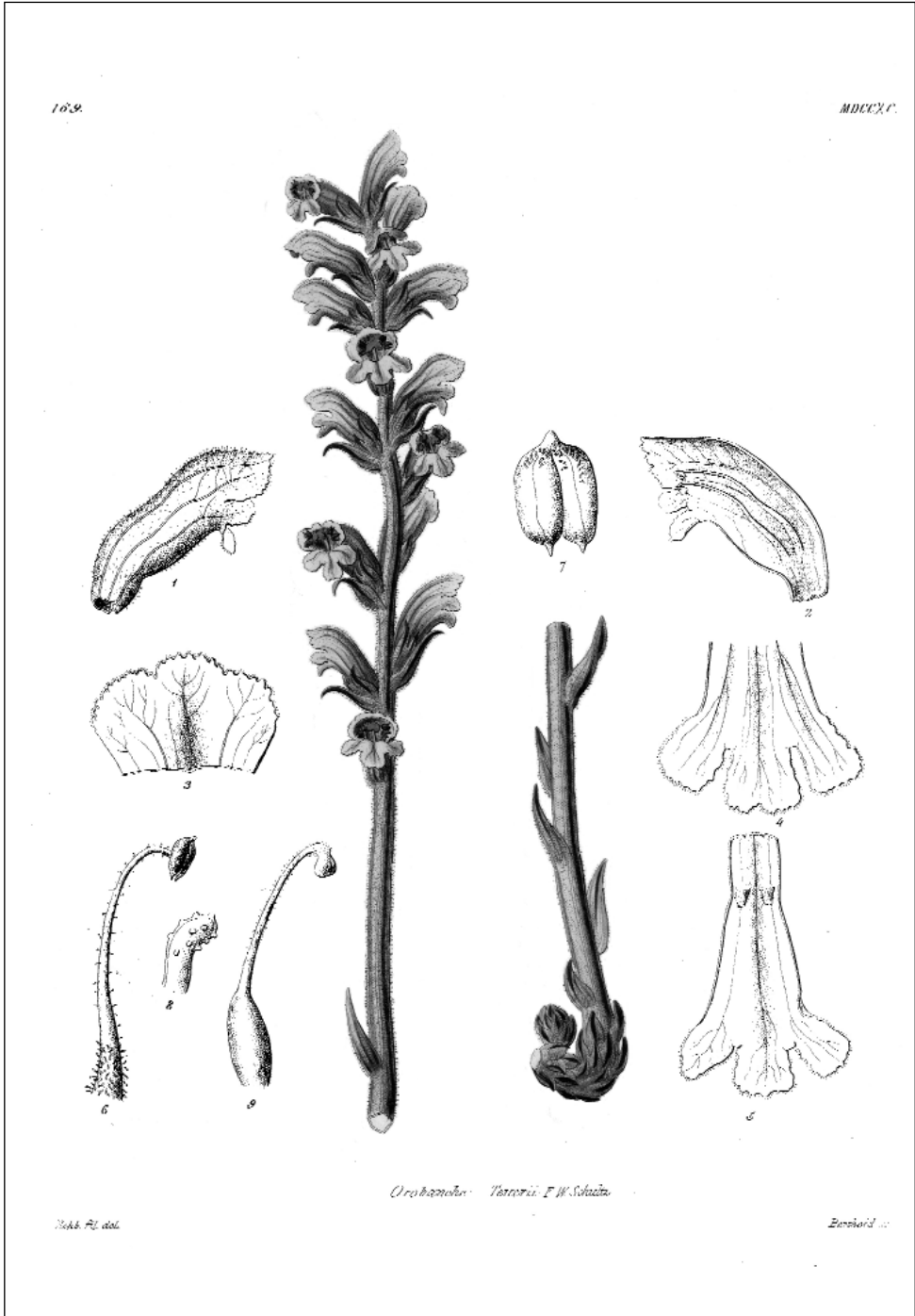


Fig. 5. *Orobanche teucris* Holandre (from Reichenbach 1862).

= *O. variegata* var. *satyrus* (De Not.) Bég. in Fiori & Paol., Fl. Anal. Ital. 2: 478. 1902

= *O. sicula* Lojac. in Naturalista Sicil. 1: 255. 1882

= *O. lutea* Lojac. in Naturalista Sicil., 1: 256. 1882 (non Baumg.)

– “*O. foetida*” sensu Biv., Stirp. Rar. Sicilia 1: [15]. 1813 (non Poir. 1789)

Icon.: Reichenbach (1862) Icon. Fl. Germ. 20: tav. 1881.

First record: Moris (1827).

Hosts: *Genista valsecchiae* Brullo & De Marco, *Calicotome villosa* (Poir.) Link, *Cytisus villosus* Pourret and other woody *Leguminosae*.

Distribution: South Sardinia and in the islands of Tavolara, S. Pietro e S. Antioco.

Specimens seen: Sant’Antioco, 05, Müller (B, W, PRC) - Sardinia, s.d., Müller (PRC) - Arizzo, 06, Moris (TO) - Sardinia, misit 1822, Moris (BOLO) - Carlo Forte, 1826, Moris (TO) - S. Elia Cagliari, 04.1826, Moris (TO) - Sardegna, misit 1829, Moris (TO) - Sardinia, misit 1846, Moris (BOLO) - Isola Tavolara, 21.05.1885, Forsyth Major (FI) - Isola di S. Antioco, 26.04.1894, Martelli (FI) - Gariga e pascoli fra Bacu Abis e Porto Scuso, punta Maiorchina, 05.04.1970, Arrigoni & Ricceri (FI) Isola di S. Antioco, Cala Sapone, 06.04.1970, Arrigoni & Ricceri (FI) - San Giovanni Suergiu, presso Matzaccara, 30.04.1974, Arrigoni, Mori & Nardi (FI) - Is. Santo Pietro, 30.3.1985, Kilian (B) - Spalmatore lungo la strada, Isola di S. Pietro, 11.04.1987, Scrugli & Zedda (CAG) - Nel ciglio della strada che porta a Chia, 28.03.1989, Zedda (CAG) - S. Margherita di Pula (Cagliari), 11.04.1993, Bacchetta (CAG) - Chia, 29.04.2006, Domina (PAL).

Taxa inquirenda et excludenda

Sardinian records of the following species are erroneous or doubtful:

Orobanche alba Steph. ex Willd. (Sp. Pl. 3: 350. 1800) was reported from Sardinia by Conti & al. (2005), but not found by us in the field or in herbaria.

Orobanche artemisiae-campestris Gaudin (Fl. Helv. 4: 179. 1829) was reported from Sardinia by Conti & al. (2005), who included *O. picridis* F. W. Schultz in their concept of the species. In our view these two are separate species. We neither found *O. artemisiae-campestris* sensu stricto in the field nor in herbaria.

Orobanche barbata Poir. sensu stricto was reported (as “var. *typica*” sensu Fiori, Nuova Fl. Anal. Ital. 2: 390. 1926) from Tavolara (Desole 1960), Abbadurente (Chiappini 1962) and the pond of Calich (Valsecchi 1964a). These records probably refer to *O. litorea* Guss.

Orobanche caryophyllacea Sm. (in Trans. Linn. Soc. London, 4: 169. (1798) was recorded for Sardinia by Moris (1827), but later omitted (Moris 1858-59). Neither was it reported by subsequent authors, nor did we find it in the herbaria studied.

Orobanche densiflora Salzm. ex Reut. (in Candolle, Prodr. 11: 19. 1847) was reported from Castelsardo (Bertoloni 1846), based on a specimen collected by Viviani (BOLO!) that belongs to *O. litorea* Guss. Moris (1858-59) had seen it in Viviani's own herbarium, mixed with *O. crinita*. Beck (1890) considered "*O. densiflora*" in the sense of Moris and Bertoloni as a variant of *O. minor* Sm. Nevertheless, *O. densiflora* is, although doubtfully, recorded for Sardinia by Chater & Webb (1972), and fully so by Conti & al. (2005).

Orobanche elatior Sutton (in Trans. Linn. Soc. London 4: 178. 1798) was recorded for Sardinia by Moris (1827), but later omitted (Moris 1858-59) and dismissed by subsequent authors (Fiori 1926; Chater & Webb 1972). Only Bocchieri (1988) reports it, with doubt, from the Asinara island.

Orobanche lutea Baumg. (Enum. Stirp. Transsilv. 2: 215. 1816) [= *Orobanche fragrantissima* Bertol. (Fl. Ital. 6: 436. 1846)] has been repeatedly reported from South Sardinia near the S. Gilla pond, from Mount Arcosu, the Rio S. Lucia valley (see also Conti & al., 2005) and, recently, the Campidano (Bocchieri & Iiriti 2006). We found no confirmation of any of these records in the herbaria studied.

Orobanche purpurea Jacq. (Enum. Agri Vindob.: 108. 1762) was reported from Sardinia by Arrigoni & Di Tommaso (1991), probably due to confusion with *O. schultzei* Mutel or *O. ramosa* subsp. *nana* (Reut.) Cout.

Conclusions

In total, 22 species of *Orobanche* have been found to occur in Sardinia, 2 of which (*O. foetida* Poir. and *O. teucryi* Holandre) are new to the island; one (*O. lavandulacea* Rchb.), reported as doubtfully present, was confirmed, another one (*O. litorea* Guss.) was segregated from *O. minor* Sm. Sardinia appears to be rich in *Orobanche* species, when compared with other territories such as the Iberian Peninsula with 30 species (Foley 2001), the Latium region with 19 species (Corazzi 2003) and peninsular Italy as a whole with 26 species (Pignatti 1982). The rarest species are: *Orobanche australis* Moris, found only on Asinara in the last 50 years; *O. denudata* Moris, restricted to in the mountain areas surrounding the Gennargentu massif; *O. foetida* Poir., collected near Sassari and in the Sulcis; *O. lavandulacea* Rchb., near Dorgali; and *O. teucryi* Holandre, found in Central Sardinia. In-depth study is required to define the conservation status of these species, the host range of *O. denudata* and *O. teucryi*, and the possible occurrence of taxa of which the past records could not be confirmed.

References

- Arrigoni, P. V. & Di Tommaso, P. L. 1991: La vegetazione delle montagne calcaree della Sardegna centro-orientale. – Boll. Soc. Sarda Sci. Nat., 28: 201-310.
- Beck Mannagetta, G. 1890: Monographie der Gattung *Orobanche*. – Pp. 1-275 in Luerksen, C. & Haenlein, F. H. (eds.): Biblioth. Bot. 19. – Cassel.

- 1930: *Orobanchaceae* L. – Pp. 1-348 in Engler, A. (ed.): Das Pflanzenreich, **96**. – Leipzig.
- Béguinot, A. 1902: *Orobanchaceae* – Pp. 470-486 in Fiori, A. & Paletti, G. (eds.): Flora analitica d'Italia, **2(3)**. – Firenze.
- Bertoloni, A. 1846: *Orobanche* – Pp. 419-455 in: Flora italica, **6**. – Bologna.
- Bocchieri, E. 1988: L'isola Asinara (Sardegna nord-occidentale) e la sua flora. – *Webbia* **42(2)**: 227-268.
- & Iiriti, G. 2006: A contribution to the knowledge of the vascular flora of the continental carbonate formations situated on the Central Eastern margins of the Campidano plain (Southern Sardinia). – *Fl. Medit.* **16**: 145-168.
- Camarda, I. 1982: Le piante endemiche della Sardegna: 106-109. – *Bull. Soc. Sarda Sci Nat.* **21**: 373-395.
- Caruel, T. 1884: *Orobanchaceae* – Pp. 345-389 in Parlatore, F. (ed): Flora italiana, **6**. – Firenze.
- Chater, A. O. & Webb, D. A., 1972: *Orobanche* L. – Pp. 286-293 in Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (eds): Flora Europaea, **3**. – Cambridge.
- Chiappini, M. 1962: Ricerche sulla vegetazione litorale della Sardegna. – *Webbia* **17(1)**: 85-152.
- Conti, F., Abbate, G., Alessandrini, A. & Blasi, C. (ed.) 2005: An Annotated Checklist of the Italian Vascular Flora. – Roma.
- Corazzi, G. 2003: Taxonomic notes and distribution of *Orobanche* L. (*Orobanchaceae*) in Latium (Central Italy). – *Webbia* **58(2)**: 411-439.
- Desole, Q. 1960: Flora e vegetazione dell'isola Tavolara. – *Webbia* **15(2)**: 461-587.
- Domina, G. & Mazzola, P. 2004: Ricerche sul genere *Orobanche* L. in Sicilia. *Orobanche litorea* Guss. – P. 223 in: 99° Congresso S.B.I. Riassunti, Torino, 22-24 settembre 2004.
- & — 2005: Notes on the genus *Orobanche* in Italy, 1. Taxa described by Bertoloni. – P. 474 in: 17° International Botanical Congress meeting Abstracts, Vienna 17-23 July 2005.
- & — 2007: Notes on the genus *Orobanche* in Italy, 2. Taxa described by Gussone. – P. 107 in Venturella, G. XII OPTIMA Meeting Abstr. Pisa 10-16 Sept. 2007 – Pisa.
- , Greuter, W. & Mazzola P. 2005: A note on the type of *Orobanche sanguinea* C. Presl (*Orobanchaceae*), nom. cons. prop. – *Taxon* **54(2)**: 500-502.
- Fiori, A., 1926: *Orobanchaceae* – Pp. 378-392 in Nuova Flora analitica d'Italia, **2**. – Firenze.
- Foley, M. J. Y. 2001: *Orobanchaceae* in the “Flora Iberica” area: new taxa, excluded taxa, and typification. – *Anales Jard. Bot. Madrid* **58(2)**: 223-233.
- Gennari, P. 1890: Repertorium florum calaritanarum ex horto sicco academico depromptum. – Cagliari.
- Greuter, W., Burdet, H. M. & Long, G., 1989: Med-Checklist, **4**. – Genève.
- Martinoli, G. 1947: Variabilità morfologica di *Orobanche demodata* Moris. – *Rendiconti Seminari Fac. Sci. Univ. Cagliari* **17(1)**: 58-65.
- Moris, G.G. 1927-1928: *Stirpium sardoarum elenchus*, **1-3**. – Taurini & Calaris.
- 1858-1859: *Orobanchaceae* – Pp. 238-256, Tavv. 102-105 in: Flora sardoa, **3**. – Taurini.
- Pignatti, S. 1982: *Orobanchaceae* – Pp. 606-616 in: Flora d'Italia, **2**. – Bologna.
- Reichenbach, H. G. 1862: *Orobanchae* Juss. Pp. 85-103, Tavv 1764-1810 in Reichenbach L., Reichenbach H. G.: *Icones Florae Germanicae et Helveticae*, **20**. – Lipsia.
- Vaccari, A. 1908: Aggiunte alla Flora dell'arcipelago della Maddalena. – *Malpighia* **22**: 15-24.
- Valsecchi, F. 1964a: Ricerche sulla vegetazione litorale della Sardegna IV: La vegetazione dello stagno di Calich (Sardegna Nord-occidentale). – *Ann. Bot. (Roma)* **28(1)**: 157-218.
- 1964b: Il componente endemico della penisola di Capo Caccia (Sardegna Nord-occidentale). – *Giorn. Bot. Ital.* **71**: 138.

Viviani, D. 1824: *Florae Corsicae specierum novarum, vel minus cognitarum diagnosis*. – Genua.

Addresses of the authors:

Gianniantonio Domina¹ & Pier Virgilio Arrigoni²,

¹ Dipartimento di Scienze botaniche dell'Università, via Archirafi, 38. – I-90123 Palermo. E-mail: gdomina@unipa.it.

² Dipartimento di Biologia vegetale dell'Università, via La Pira, 4. – I-50121 Firenze. E-mail: fitogeo@unifi.it