

OROBANCHE CLAUSONIS POMEL (OROBANCHACEAE) IN THE IBERIAN PENINSULA

by

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Resumen

FOLEY, M.J.Y. (1996). *Orobanche clausonis* Pomel (Orobanchaceae) en la Península Ibérica. *Anales Jard. Bot. Madrid* 54: 319-326 (en inglés).

Orobanche clausonis Pomel fue descrita sobre plantas recolectadas en Argelia, donde parasitaba a *Asperula hirsuta* (Rubiaceae). Desde entonces, ha sido colectada ocasionalmente en varias localidades del sudoeste de Europa, especialmente en la Península Ibérica. Sin embargo, es aún mal conocida. En este trabajo se estudian la morfología y la taxonomía de la especie y se propone que las plantas europeas queden cobijadas bajo el trinomen *O. clausonis* subsp. *hesperina* (J.A. Guim.) M.J.Y. Foley, *comb. & stat. nov.*

Palabras clave: *Spermatophyta*, *Orobanchaceae*, *Orobanche*, taxonomía, Península Ibérica, Argelia.

Abstract

FOLEY, M.J.Y. (1996). *Orobanche clausonis* Pomel (Orobanchaceae) in the Iberian Peninsula. *Anales Jard. Bot. Madrid* 54: 319-326.

Orobanche clausonis Pomel was first described from Algeria where it was thought to be parasitic upon *Asperula hirsuta* (Rubiaceae). Since then, genuine records have been scarce and although occasionally collected from various localities in south-western Europe (especially the Iberian peninsula), where it is mainly parasitic upon members of the Rubiaceae, its identity and taxonomy have been poorly understood. Based principally on the limited number of preserved specimens available, the general morphology and taxonomy of *O. clausonis* has been investigated. As a result, it is proposed that the European plants be separated as *Orobanche clausonis* subsp. *hesperina* (J.A. Guim.) M.J.Y. Foley, *comb. & stat. nov.*

Key words: *Spermatophyta*, *Orobanchaceae*, *Orobanche*, taxonomy, Iberian Peninsula, Algeria.

INTRODUCTION AND HISTORY

Since first described by POMEL (1874: 107) based upon material collected in 1858 by Clauson and growing on *Asperula hirsuta* at Mouzaïa, Algeria, there has been much confusion regarding the identity and taxonomic status of *Orobanche clausonis*, a holoparasite mainly on members of the Rubiaceae. Much

of this results from the scarcity of subsequent records and the dearth of specimens retained in herbaria. In the present work an attempt has been made to reassess the taxonomic status of the plant based mainly upon the relatively limited quantity of preserved material available. Only one present-day locality has so far been definitely identified for the plant, but such apparent scarcity may be a result of mis-

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identification and under-recording rather than a reflection of extreme rarity, although it is undoubtedly uncommon.

In his original description of *O. clausonis*, POMEL (1874: 107) remarked on several important characters: the rather dense inflorescence, the tubular to campanulate corollas, the calyx divided into four shortly lanceolate, subequal divisions, and the insertion of the filaments in the lowest quarter of the corolla tube, the filaments themselves being slightly pubescent at their base. Of these characters, it is the shape of the broad, relatively short, divided calyx as evidenced in the type specimen (Mouzaïa, 1858; *Clauson*, MPU), which especially separates *O. clausonis* from similar taxa.

Following Pomel's diagnosis, there appears to be no mention of *O. clausonis* until a dismissive comment by BATTANDIER & TRABUT (1890: 661) that it was merely a glabrescent form of *O. galii* Vaucher var. *atlantica* having more hispid filaments and hairy anthers. This latter taxon, apparently parasitic upon *Galium tunetanum*, is a small-flowered variant of the widespread European *O. caryophyllacea* Sm., a very different and distinctive plant to *O. clausonis*, again apparently restricted in its host to members of the Rubiaceae. It is not clear whether Battandier & Trabut's comments were based upon actual experience of *O. clausonis*, but any affinities between it and variants of *O. caryophyllacea* can be dismissed upon morphological grounds. In the same year, BECK (1890: 234) included *O. clausonis* in his monograph of the genus *Orobanche*, listing Clauson's Algerian locality, although not having seen the original specimen. He also added a record of Boissier's and Reuter's from Granada, Spain, in 1849 (specimen now in LE - corolla dissections in PRC!) which at that time appeared to be the first and only European record for the plant. He surprisingly placed *O. clausonis* close to taxa of the *O. minor* group (i.e. in his grex *Minores*) despite its very different calyx shape, which contrasts with the elongated, tapering calyces of members of his grex *Minores*.

In *Prodromus Florae Hispanicae*, WILKOMM & LANGE (1870) made no reference to

O. clausonis, although it was included in the subsequent supplement (WILKOMM, 1893: 188) based on BECK's (1890: 235) verification of the Granada specimen. Later, when Guimarães published his monograph on Portuguese *Orobanche* he included under *O. lucorum* A. Braun (GUIMARÃES, 1904: 85) a new variety *hesperina* based on plants from four collections by Welwitsch and by Daveau. These were parasitic upon *Rubia* spp. and in one case upon *Quercus pseudococcifera* and were collected from a rather limited area of central Portugal. From elsewhere in his monograph it is clear that Guimarães was aware of the principal characters of Pomel's *O. clausonis* since he occasionally quotes such characters in comparison to other taxa and he placed it close to *O. mauretanica* Beck (grex *Minores*). However he did not consider *O. clausonis* to be a Portuguese plant nor did he refer to it in relation to his *O. lucorum* var. *hesperina*. His attribution of the Welwitsch and Daveau specimens to *O. lucorum* is intriguing and a possible explanation may lie in a combination of factors. True *O. lucorum*, parasitic on *Berberis* spp., has a narrow distribution in central Europe, occurring essentially over a limited area of the eastern Alps. It is readily separated from Guimarães' Portuguese var. *hesperina* on calyx shape alone - the lobes of *O. lucorum* being much longer and narrower than in var. *hesperina*. On the relatively limited information available at the time, it is possible that Guimarães associated his var. *hesperina* with *O. lucorum* based on similar colouration (yellow). Also, a variant or segregate of *O. lucorum* from south-eastern France parasitic upon *Rubus* spp. had been described as *O. rubi* (DUBY, 1828: 350). This, together with the fact that Welwitsch had annotated one of his sheets "*O. rubii*", may have led to a possible misinterpretation of their respective hosts and therefore to the connection with *O. lucorum*. Nevertheless, Guimarães did indicate that the specimens of Portuguese "*O. rubi* Duby" which he had seen differed from typical *O. lucorum* in several respects and for that reason he gave them the varietal rank *hesperina*.

In *Flore de Portugal*, COUTINHO (1913: 569) took a different view and accepted

O. clausonis as a Portuguese plant. This was presumably based upon the same specimens considered by Guimarães under his *O. lucorum* var. *hesperina*, since he listed the localities and hosts of Welwitsch's collections, annotated some of the sheets and added a taxonomic description. He did not include *O. lucorum* for Portugal. This stance has been maintained subsequently for Portugal (COUTINHO, 1939: 673; SAMPAIO, 1946: 498; FRANCO, 1984: 280) but *O. clausonis* is excluded in works covering Algeria and Morocco (SAUVAGE, 1961; NÈGRE, 1962; QUÉZEL & SANTA, 1963) and most regions of Spain (COSTA, 1864; FERNÁNDEZ-GALIANO & HEYWOOD, 1960; VALDÉS & *al.*, 1987; ROMO, 1989; BOLÒS & *al.*, 1990; SANZ, 1990, 1992). However, in eastern Andalucía there is a single record by SAGREDO (1987: 421) of plants parasitic upon *Galium verrucosum* at Barranco del Caballar, Almería and another by MUÑOZ-MEDINA (1944: 121) from near Lanjarón, Granada province. Two collections from Galdo, north-west Spain, and mentioned by MERINO (1906: 45) under *O. lucorum*, may also be *O. clausonis*. FRANCO (1984: 280) recently extended the Portuguese range of *O. clausonis* to include the Atlantic off-shore Ilhas Berlengas.

In *Flora Europaea*, CHATER & WEBB (1972: 292) listed it as present in Spain, Portugal and Malta, based upon information given in BECK's monographs (1890: 235; 1930: 218). However, the sole Maltese record appears to be that of Sommier's collection (FI) which Beck named f. *parviflora* (BECK, 1922: 39). This attribution appears to be dubious and is discussed further below. This Maltese record is perpetuated by HASLAM & *al.* (1970: 299) in their *Flora* of the island.

In addition to these herbarium and literature records, other herbarium specimens have been traced. All of these will now be examined in more detail below.

MATERIALS AND METHODS

Most major European herbaria considered likely to hold specimens of this taxon have

been contacted for the loan of material. From the response it is evident that collections are very scarce and this possibly reflects the plant's overall rarity in nature. Loan specimens and specimen photographs have been obtained from the following herbaria: E, COI, FI (photo), G, LISE, LISU, LTR, MPU, PRC, RNG.

A range of quantitative morphological characters which are considered to be of taxonomic significance within the genus were examined on these specimens and where appropriate single detached corollas were softened prior to dissection by soaking for five minutes in boiling water containing a small amount of surfactant. Measurements included: plant height, inflorescence length, inflorescence height, corolla length, corolla width, overall calyx length, calyx length to the division of the teeth, and typical height of filament insertion above the corolla base. Estimates have also been made of inflorescence density, corolla shape, calyx shape and of filament pubescence. The results are shown in Table 1. It should be borne in mind that dimensions of width are likely exceed to those found in living material.

RESULTS AND DISCUSSION

From the results shown in Table 1 it is clear that the specimens possess many of the main characters indicated by POMEL (1874: 107-108) in his original diagnosis of *O. clausonis*, viz: corollas tubular to campanulate, calyces divided into four, short, subequal divisions, and filaments pubescent at the base and inserted in the lowest quarter of the corolla tube. In all specimens the short, broadly bifid calyx lobes, divided to approximately half their length, are particularly characteristic and the height of filament insertion and degree and distribution of filament pubescence is fairly constant throughout. Nevertheless, despite the very limited amount of material available, it is particularly noticeable that compared to the Algerian specimens, those from the Iberian peninsula have a much laxer inflorescence, in which the corolla is more patent (very erect in the type) and the corollas themselves appear

TABLE 1
MORPHOMETRIC EVALUATION OF HERBARIUM SPECIMENS ATTRIBUTED TO *OROBANCHE CLAUSONIS* POMEL (all measurements in mm)

Specimen	Plant	Inflorescence			Corolla			Calyx			Filaments		Host
		Typical length	Width	Density	Length	Width	Shape/attitude	Length	Length to division	Shape	Insertion height above base	Pubescence	
ALGERIA: Clauson (Type) (MPU) (Mourzaia, 19? V-1858) Herb. Bataandier, s.d. (MPU) (Colonne-Vaurol, Algeria)	200	95	20	Dense	16-17	5.5	Subcampanulate/erect	8	5	Shortly bifid	2.5-3	Hairy below; glabrous above	<i>Asperula hirsuta</i>
	230	145	20	Dense	14	6	Subcampanulate/ fairly erect	7.2	4	Shortly bifid	2.5	Glabrous	<i>Asperula hirsuta</i>
PORTUGAL: Rainha 1525 (G), near S. Mamede, Bombarral, 29-IV-1948	335	105	33	Fairly lax	17	6	More or less tubular/ erecto-patent	8	4.5	Shortly bifid	3-4	Slt. hairy below and above	<i>Rubia peregrina</i>
	450	150	30	Fairly lax	17	6	Approx. tubular/ patent to erecto-patent	8	4	Shortly bifid	2	Long hairs below, glabrous above	<i>Quercus coccifera</i> (<i>Rubia peregrina</i>)
DAUVAU (LJSU) (El Carmen/Portinho, Sierra de Arrabida, v. 1882)	490	160	35	Lax	19	6	Tubular/erecto-patent	8.5	5	Shortly bifid	2	V. slightly hairy below, otherwise glabrous	"Rubii"
	270	55	24	Lax	17	6.5	Tubular/erecto-patent	7	4.2	Shortly bifid	3-4	Occas. long hair below, otherwise glabrous	<i>Quercus pseudococcifera</i>
WELWITSCH (LJSU) (Sierra de Luiz, near Vendus, 4-V-1845)	300	100	32	Lax	17.5	5	Tubular-slightly campanulate/ erecto-patent	7.5	4.3	Shortly bifid	[2-2.5]		
	185	53	22	Lax	17	6	Tubular-slightly campanulate/ erecto-patent	6	2.7	Shortly bifid	2		
WELWITSCH (S. Arrabida) (LJSU) (S. Arrabida, 20-V-1849)	165	30	25	Fairly dense	?	?	Tubular-slightly campanulate/ erecto-patent	7.3	4.5	Shortly bifid	2		
	235	56	27	Fairly dense	15	5	Tubular-slightly campanulate/ erecto-patent	9	5	Shortly bifid	2.5		
WELWITSCH (S. Montejunto) (LJSU) (Sierra de Montejunto, V-1848)	162	30	16	Fairly dense	?	?	Tubular-slightly campanulate/ erecto-patent	?	?	Shortly bifid	2.5		
	285	100	22	All fairly lax	16.5	5.5	Tubular-slightly campanulate/ erecto-patent	8	5.5	Shortly bifid	2-3		
SPAIN: Herb. Carr (RNG) (collected in the vicinity of Ronda, 17-V/2-VI-1975 field no. 2104)	205	62	20	Fairly lax	14.5	5	Approx. tubular/ erecto-patent	9.3	4.5	Shortly bifid	3.5-4.5	Occas. long hairs below, glabrous above	?
	240	60	26	Fairly lax	16.5	5.5	Tubular-slightly campanulate/ erecto-patent	8.5	5	Shortly bifid	2.5	Scattered long hairs below, glabrous above	<i>Rubia</i>
BOISSIER & REUTER (PRC**) (Granada, Spain, 1849)	395	155	30	Fairly lax	22	6.5	Tubular-slightly campanulate/(no inflorescence seen)	8.5	5	Shortly bifid	2.5		

* Not measured-fragment of specimen. ** Fragment only ex herb. Beck (PRC), remainder in LE. ? Not recorded.

slightly larger and perhaps more tubular; these plants are also more robust. It therefore seems appropriate to give the Iberian plants subspecific recognition under *O. clausonis*.

As well as those listed in Table 1, other specimens previously referred to *O. clausonis* have been examined. Material collected by Sommier from Malta was described as *O. clausonis* f. *parvifolia* BECK (1922: 39). Although not available for loan, detailed photographs of this collection [Sao Paolo, Malta, 1907, Sommier (FI)] have been examined. It would appear not to be *O. clausonis* but is possibly referable to a form of *O. caryophyllacea*, resembling it particularly in corolla shape. Another collection of very similar plants (also referred to *O. clausonis* by the collector) is that from the Sierra del Pinar, Cádiz Province, Spain [1973, Smythies 829 (LTR)]. These specimens, although larger than those from Malta, have very noticeable elongated calyx teeth and are clearly not *O. clausonis*. They again possess some morphological similarities to *O. caryophyllacea*. A further specimen referred to *O. clausonis* is unlocalised, undated and on an unrecorded host [Moris in herb. Pomel (MPU)]. Again, it would appear not to be that taxon, but rather a variant of *O. caryophyllacea*. A single, rather inadequate specimen from the Balearics [Majorca, 1985, Beckett (RNG)], initially referred to *O. loricata* Rchb., could in fact be *O. clausonis*, but no host is indicated and other important details are lacking.

The scarcity of records and herbarium material and comments in the literature (BATTANDIER & TRABUT, 1890: 661) and on several herbarium labels suggest that the plant is of rare occurrence. It does not appear to have been found in large populations, usually only as scattered or isolated individuals. At the present time, political considerations in Algeria prevent field work from being carried out but when the opportunity arises, a comparison of living Iberian and Algerian plants should be made. The currently known geographical distribution of *O. clausonis* is mapped in Figure 1.

CLASSIFICATION, DESCRIPTION AND SUMMARY

***Orobanche clausonis* Pomel, Nouv. Mat. Fl. Atlant.: 107-108 (1874)**

Typus: Parasitic upon *Asperula hirsuta* at Maziz, Mouzaia [Algeria], 1858, leg. Clauson (MPU!).

Plant 14-50 cm high, stem pale yellow, slightly glandular-pubescent; leaves lanceolate, sparse; inflorescence 3-16 cm long, fairly lax to dense; corollas pale yellow, tubular to slightly campanulate, 13-22 mm long, usually 15-20 mm, erecto-patent to suberect, dorsal line curved, lower corolla lip prominent, sometimes recurved; bracts lanceolate, 11-20 mm long, glandular-pubescent; calyx lobes broad, short, 7-9 mm long, each divided to approximately half their length into two short, more or less equal teeth; filaments hairy below, glabrous above, inserted 2-4.5 mm above base of corolla; stigma lobes pink or red. Flowering: April - May (-July). Chromosome number: - not known.

Geographical distribution: Apparently very local in Portugal, Spain and Algeria. Possibly also in the Balearics.

Habitat: Mainly parasitic upon members of the Rubiaceae, but in Portugal recorded also

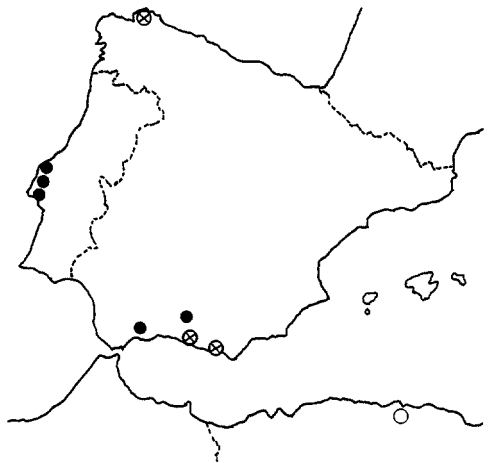


Fig. 1.—Geographical distribution of *Orobanche clausonis* Pomel, based upon U.T.M. 50 km squares (○ subsp. *clausonis*; ● subsp. *hesperina*; ⊗ unconfirmed literature records).

upon *Quercus coccifera* (= *Q. pseudococcifera*) which may be a secondary host. This association led Welwitsch to annotate his specimen from Serra de Luiz (LISU) as "*O. dryophila* n.sp." [nomen nudum]. Amongst the *Rubiaceae*, *Asperula hirsuta*, *Galium tunetanum*, *G. verrucosum* and *Rubia peregrina* have been recorded. The main habitat is that of its host - scrub, matorral, open grassland.

Morphometric affinities and discontinuities: The plant has been variously placed in the *O. minor* group (BECK, 1890: 234, 1930: 218) as well as in association with the dissimilar *Orobancha lucorum* (GUIMARÃES, 1904: 85; BECK, 1930: 266). The similarity in colouration and other misconceptions may be a reason for its inclusion in the latter but there seems to be no justification for any morphological association with the central European *O. lucorum*. There are undoubted similarities between *O. clausonis* and taxa within the *O. minor* group, but the very distinctive shape of the short ovate calyx teeth distinguish *O. clausonis* from all members of this group as well as from many other *Orobancha* taxa. Since certain other morphological differences are detectable in *Orobancha clausonis* when examined across its geographical range, *O. clausonis* has been separated into two subspecies.

a. subsp. *clausonis*

Geographical distribution: Occurs locally in northern Algeria, where it is probably rare.

Specimens seen

ALGERIA: Mouzaïa, 1858, *Clauson* (MPU), parasitising *Asperula hirsuta* (type). Colonne-Voirol, s.d., *herb. Battandier* (MPU), parasitising *Asperula hirsuta*. Medea Nador, 1887, *herb. Battandier* (MPU), parasitic on *Galium tunetanum* [poor specimen].

b. subsp. *hesperina* (J.A. Guim.) M.J.Y. Foley, **comb. & stat. nov.**

≡ *O. lucorum* A. Braun var. *hesperina* J.A. Guim in Brotéria 3: 85 (1904); *O. hesperina* (J.A. Guim.) Beck in Engl., Pflanzenz. 96: 266 (1930)

Typus: The specimen annotated "*Oroban-*

che Rubiae (Welw.N.Sp.) (ad radices *rubii*)". Serra da Arrabida, Valle entre El Carmen & Portinho, Mai 1882, leg. J. Daveau (LISU). (Lectotype here designated: left hand specimen).

Illustrations: Figure 2; Beck (1890) Taf. IV, no. 72; Sagredo (1987: 421).

Description: Differs from the type in its laxer inflorescence, slightly longer, erectopatent (not erect/suberect) and perhaps more tubular corollas and in its generally more robust habit.

Geographical distribution: Occurs locally in central Portugal, and southern Spain. Possibly also in north-west Spain.

Specimens seen

SPAIN: Granada, 1849, *Boissier & Reuter* (PRC) (dissection), entire specimen in LE (not seen), parasitising *Rubia* sp. Near Ronda, 1975, *herb. Carr* (plus illustration) (RNG), host not recorded.

PORTUGAL: Near Vendas, Serra de S. Luiz, 1845, *Welwitsch* (LISU), parasitising *Quercus pseudococcifera*. Serra de Montejunto, 1848, *Welwitsch* (LISU), parasitising "*Rubiae*". Serra da Arrabida, 1849, *Welwitsch* (LISU), parasitising "*Rubiae*". Between El Carmen and Portinho, Serra da Arrabida, 1882, *Daveau* (LISU), parasitising "*Rubii*", annotated "*Orobancha Rubiae* n.spec.!" (lectotype). Mata do Vidal, Serra da Arrabida, 1952, *Silva, Fontes & Silva 5080a* (LISE), on *Rubia peregrina*. Bombarral, Serra Mamede, 1948, *Rainha 1525* (G, LISE), parasitising *Rubia peregrina*. Bombarral prox. de Requengo Grande, 1950, *Rainha 1955* (LISE), parasitising *Rubia peregrina*. Nazaré, 1994, *Sales & Neves 138* (E), parasitising *Rubia peregrina*.

Note: The occurrence of two host families for *O. clausonis* subsp. *hesperina* is perhaps a little unexpected, but simultaneous attachment to the roots of up to three different host families is not unknown in *Orobancha* (HIPKIN, 1992: 117) and other parasitised taxa may have been overlooked during collection. At the one recently recorded locality [Nazaré, Portugal, 1994, *Sales & Neves 138* (E)], where *Rubia peregrina* was abundant, the observed host was initially thought to be *Quercus coccifera* but on re-examination was later confirmed to be *Rubia peregrina* (pers. comm. F. Sales). The original Granada specimen collected by Boissier & Reuter in 1849, from which Beck dissected corollas (now in PRC), is in LE but has unfortunately not been available for exa-

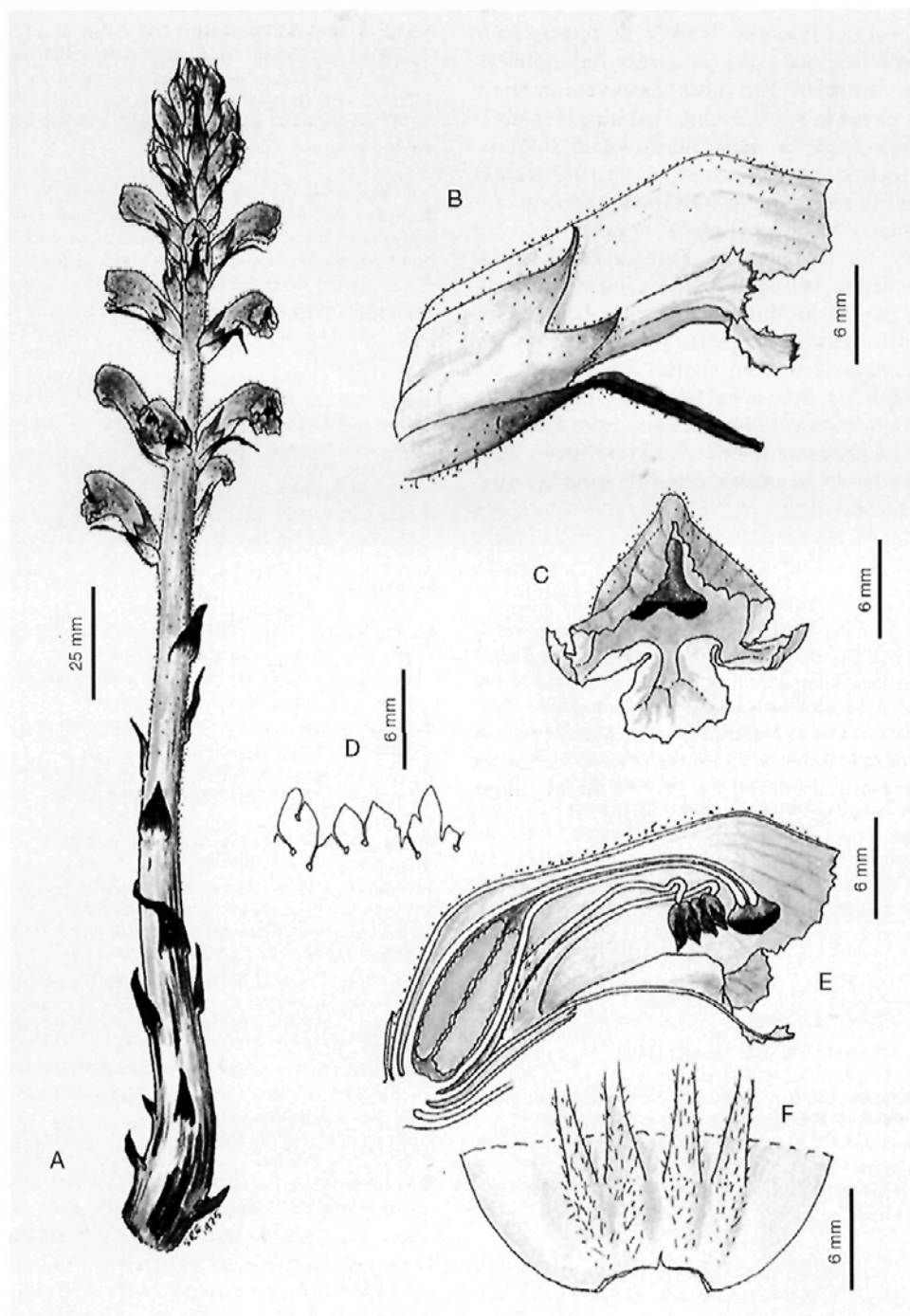


Fig. 2.—*Orobanché clausonis* subsp. *hesperina*, Ronda, Andalucía, Spain (RNG): A, whole plant; B, corolla, calyx and bract (side view); C, corolla (front view); D, lower lip of corolla (expanded); E, section of corolla (side view); F, filament attachment to corolla base (expanded).

mination. However Beck's dissections have been examined and are clearly referable to *O. clausonis*. The subsp. *hesperina* is finely depicted in S.R. Edwards' painting (Figure 2) made from the living plant of Carr's collection from near Ronda, Spain in 1975 (RNG) (illustration also in RNG). A colour photograph of the living plants of Sales & Neves 138 (E) from Nazaré, Portugal has been attached to the specimen sheet and other photographs (!) of this collection are held by the collectors and others. Other records for *O. clausonis* from Galdo, Spain (MERINO, 1906: 45), from near Lanjarón, Granada (MUÑOZ MEDINA, 1944: 121) and from Barranco del Caballar, Almería (SAGREDO, 1987: 421) appear to be unsupported by voucher specimens.

ACKNOWLEDGMENTS

I am very grateful to the curators of the herbaria at E, COI, FI, G, LISU, LTR, MPU, PRC and RNG for their help with loan specimens, to Dr F. Sales (Coimbra) for the loan of colour photographs of the plant *in situ*, to Dr S.R. Edwards (Manchester) for permission to publish his drawing of *O. clausonis* subsp. *hesperina*. I would also like to thank Dr N.K.B. Robson (London) for his advice on nomenclature, Dr G. Halliday (Lancaster) for commenting on the draft of this paper, and the Trustees of the Botanical Research Fund and of the Welch Bequest for financial assistance towards this project.

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