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Typification of *Hyobanche sanguinea* (Orobanchaceae) and the identity of *Hyobanche calvescens* and *Hyobanche glabrata*

ANDREA D. WOLFE

The Ohio State University, Department of Evolution, Ecology, and Organismal Biology, 318 W. 12th Avenue, Columbus, Ohio, 43210, USA. Email: wolfe.205@osu.edu

Abstract

Hyobanche sanguinea (Orobanchaceae) is a member of a small genus of holoparasitic plants endemic to southern Africa. The description by Linnaeus in 1771 did not include a designated holotype, and no such material has been located in the Linnaean herbaria housed in London or Uppsala. After studying the Linnaean collection of *Hyobanche* specimens, and researching the history of botany in South Africa, a lectotype is here designated, and an epitype from the Cape Peninsula assigned. In addition, a study of type specimens for *H. calvescens*, *H. glabrata*, and *H. rubra* reveals that the type specimens for *H. calvescens* and *H. glabrata* fall within the circumscription of *H. rubra*, resulting in synonymization of both names.

Key words: epitype, holoparasitic plant, *Hyobanche rubra*, lectotype, nomenclature

Introduction

Hyobanche L. is a small genus of holoparasitic plants found in South Africa, Lesotho, and Namibia. Currently there are nine species recognized in *Hyobanche*: *H. atropurpurea* Bolus (1885: 67), *H. barklyi* Brown (1901: 129), *H. calvescens* Gandoyer (1919: 220), *H. fulleri* Phillips (1923: 89), *H. glabrata* Hiern (1904: 417), *H. robusta* Schönland (1913: 301), *H. rubra* Brown (1901: 129), *H. sanguinea* Linné (1771: 253), and *H. thinophila* Wolfe (2014). As part of a revision of *Hyobanche*, type specimens for species of *Hyobanche* were examined, with the exception of *H. sanguinea* for which no holotype has been assigned. A lectotype and epitype for *H. sanguinea* is assigned here, and taxonomic changes for the status of *H. calvescens* and *H. glabrata* are made.

Materials and Methods

Herbarium specimens for *Hyobanche* borrowed from BLFU, BOL, GRA, J, NBG, NH, NU, PRE, PRU, and SAM, and accessions collected by the author from 1996 to 2013 were used in this survey. In addition, digitized type specimens of *Hyobanche* in the Linnaean collections housed in London and the Swedish Natural History Museum, Naturhistorisches Museum Wien (made available for this study, courtesy of J. Greimler, E. Vitek, and H. Rainer), and at Kew were examined online (Linnaean.org; S-Linn, W, and K, respectively).

Holotypes for *H. calvescens* and *H. rubra* were available for study as digitized specimens from W (*H. calvescens*) and K (*H. rubra*), with isotypes and syntypes available for *H. rubra* and *H. glabrata* from borrowed specimens (PRE) and digitized specimens (K). However, there has been no type specimen designated for *H. sanguinea* (The Linnaean Plant Name Typification Project). A specimen annotated as *H. sanguinea* by Linnaeus (S-Linn) was examined. The protologue and additional historical information regarding the history of botany in South Africa were also studied to facilitate type selection for *H. sanguinea* (Sparman 1785; Rourke 1986).

Typification

Hyobanche sanguinea L. (1771: 253).

The protologue for *H. sanguinea* states “Habitat ad Cap. B. spei...”, which would indicate the type locality should be the Cape of Good Hope on the Cape Peninsula of South Africa.

***Hyobanche sanguinea* L. (1771:253)**

Lectotype (designated here): SOUTH AFRICA. Sparrmann *s.n.*: S-Linn!

Epitype (designated here): SOUTH AFRICA.—Western Cape: Table Mountain National Park on the Cape Peninsula, above Oliphantsbos Road, near rock outcrop and throughout sandy slope of coastal fynbos, elev. 22 m, S 34° 14' 33", E 18° 23' 03"; 22 m; 26 Aug 2013; *Wolfe 1387*. (NBG!; isoepitype: OS!)

Taxonomic notes

The only specimen annotated by Linnaeus as *H. sanguinea* in the Linnaean Collection at either the Swedish Natural History Museum or London was a specimen collected by Anders Sparrman, who arrived in Cape Town for the first time in April, 1772 (Sparrman 1785). Sparrman resided on the Cape Peninsula until November, 1772, when he joined the James Cook expedition to the South Atlantic. He returned to Cape Town in 1775. During his time on the Cape Peninsula, he made observations and collections of plants, sometimes with his Uppsala colleague Carl Peter Thunberg, and recorded that he sent duplicates of all his specimens to his mentor, Linnaeus:

“And as I had many Swedish friends, and particularly the great Linnaeus, always present in my memory, every duplicate or triplicate of the plants that I gathered, gave me sensible pleasure; though my covetousness for myself and my friends, frequently induced me to gather more than I was able to attend to, and dry in a proper manner.” (Sparrman 1785: 17).

“... I therefore neglected no opportunity of sending to Sir Charles Linnaeus duplicates of everything I found, together with my remarks on them. Unfortunately, this man’s great illness, declining years, and intervening death, have prevented us long from seeing them in print, in a *Mantissa tertia*.” (Sparrman 1785: 18).

The Sparrman collection of *H. sanguinea* is undated and lacking locality data. However, given that he resided on the Cape Peninsula, primarily in Simon’s Town, from the time he arrived until summer of 1772, and refers to seeing *H. sanguinea* in bloom in late winter or early spring of 1772, one can infer that the specimen in the Linnaean collection came from the Cape Peninsula. Sparrman’s description of *H. sanguinea* is on p. 28 of his 1785 book:

“The *Hyobanche sanguinea*, a parasitic plant, towards spring, began to throw out its blood-red tufts of flowers in the naked sand; an *Osteospermum* or two, as well of the arboreus as herbaceous kind, were now and then likewise found in the bare sand.”

Additional information in support of the Cape Peninsula as the type locality for *H. sanguinea* is found in the history of botany for South Africa:

“Until the arrival of Sparrman and Thunberg in 1772, practically all significant published research of the Cape Flora had been undertaken in western Europe by botanists who had never set foot on the shores of Table Bay. They relied almost exclusively on collections of pressed dried plants gathered by a second party, often the Dutch East India Company’s master gardener at the Cape.” (Rourke 1986).

Given the lack of locality data for the Sparrman specimen, it is not possible to identify exactly where it was collected. However, the historical context described above, and general locality information in Linné’s (1771) original species description supports the Cape of Good Hope as the type locality. Thus, the Sparrman specimen is designated as the lectotype for *H. sanguinea*. A specimen and its duplicate collected from Table Mountain National Park, near the Cape of Good Hope, are designated here as epitype and isoepitype (Figures 1–2).



FIGURE 1. Habit of *Hyobanche sanguinea*. Table Mountain National Park, South Africa; *Wolfe 1387* collection.

Taxonomic clarification and synonymization for *Hyobanche rubra*, *H. calvescens*, and *H. glabrata*.

Hyobanche rubra N.E. Brown (1901: 129). TYPE:—SOUTH AFRICA. Western Cape: Near Gauritz River Bridge, Mossel Bay District, 9 Sep 1897; *Galpin 4392*. Holotype K!; Isotype PRE!

Hyobanche glabrata Hiern (1904:417). Syntypes:—SOUTH AFRICA. Western Cape: George Division between Zwarte Vallei and the western end of Lange Vallei, *Burchell 5696* (BOL!, PRE!); SOUTH AFRICA. Northern Cape: Between Buffels Rivers and Silver fontein, Little Namaqualand, elev. 610 m; 1837; *Drege s.n.* (K!); SOUTH AFRICA. Northern Cape: Kans Mountains, Little Namaqualand, elev. 914-1219 m; *Drege s.n.* (K!); SOUTH AFRICA. Eastern Cape: Queenstown Division, *Barber s.n.* (K!).

Lectotype (designated here):—SOUTH AFRICA. Northern Cape: Between Buffels Rivers and Silver fontein, Little Namaqualand, elev. 610 m; 1837; *Drege s.n.* K!

Hyobanche calvescens Gand. (1919: 220). TYPE:—SOUTH AFRICA. Western Cape: Caledon, Leo's Kraal, 18 Oct 1894; *Penther 1878*. Holotype W!



FIGURE 2. Dissected view of *Hyobanche sanguinea* flower; Wolfe 1387 collection: a. bract, b. two bracteoles, c. corolla, d. calyx.

Taxonomic notes. No holotype was selected for *H. glabrata* in Hiern's (1904) description. The *Burchell 5696* and *Barber s.n.* accessions are nearly identical to the type specimen for *H. rubra*. The Little Namaqualand accessions are slightly different in morphology (somewhat less pubescence on the lower part of the corolla). From my own collections, the color for Karoo and Namaqualand populations tend to be more red and orange in color compared to the southern and eastern populations of *H. rubra*, which are usually a light to dull pink, and the amount of pubescence ranges from nearly glabrous to pilose. Thus, a lectotype was selected from the Little Namaqualand accessions to reflect the slight morphological differences among regions and the convention used by most botanists who interpret *H. glabrata*'s epithet to indicate nearly glabrous corolla morphology.

In addition to the holotypes and syntypes for these three taxa, 161 herbarium specimens were examined as part of a revision of the genus to determine if there are morphological characters to differentiate these taxa. It is noteworthy that there are no accessions designated as *H. calvescens* among the loaned material from the herbaria listed above. Although there is slight variation in morphology among accessions of *H. rubra* and *H. glabrata* from different geographic regions, there are no characters to distinguish one species from the other, and the holotype specimen of *H. calvescens* is indistinguishable from the types of *H. rubra* and *H. glabrata*. Molecular marker data also reveals no species delimitation between *H. rubra* and *H. glabrata* (Wolfe & Randle 2001; Wolfe *et al.* unpublished data).

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