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Primula ×*chignolensis* (Ericales: Primulaceae), a new primrose hybrid discovered in Val Seriana (northern Italy)

Enrico Banfi^{1*}, Renato Ferlinghetti²

¹ Via Teodosio 55, I-20131 Milano; parajubaea@gmail.com

² Via Luigi Einaudi 1, I-24123 Bergamo; renato.ferlinghetti@unibg.it

* Corresponding author: parajubaea@gmail.com

Abstract - A new hybrid of primrose discovered fifteen years ago in the locality Bivacco La Plana, Pre-Alps of Bergamo, above Chignolo, a hamlet of the municipality of Oneta, later also confirmed for the crest of Mount Alben, always in the same municipality, is here described. The parental species turn out to be *Primula albenensis* Banfi & Ferl. and *P. auricula* L., the former endemic to the mountains of Bergamo (Mount Alben, Mount Aralalta group and the Ancogno Valley), the latter a European orophyte, here coexisting often together on limestone faces. The new finding shows constant morphology in its stands, and there is no evidence of either "hybrid swarming" or introgression to exclude the total sterility of the population and this occurrence should be considered result of a process of *inter parentes* hybrid speciation (nothospecies) deserving of taxonomic recognition.

Key words: description, hybrid speciation, nothospecies, *Primula*.

Riassunto - *Primula* ×*chignolensis* (Ericales: Primulaceae), un nuovo ibrido di primula scoperto in Val Seriana (Italia settentrionale).

Viene descritta una nuova notospecie di *Primula* scoperta nelle Prealpi Bergamasche, risultato di ibridazione fra *P. albenensis* Banfi & Ferl., endemica del Monte Alben, del gruppo del Monte Aralalta e della Val d'Ancogno, e *P. auricula* L. orofita europea, conviventi nell'area geografica in oggetto. L'ibrido presenta caratteri definiti e costanti senza elementi di "sciame ibrido" né segni di introgressione che ne tradiscano una fertilità anche solo parziale. Pertanto, i popolamenti osservati vanno interpretati come risultato di una speciazione ibridogenica *inter parentes* (notospecie) meritoria di riconoscimento tassonomico.

Parole chiave: descrizione, notospecie, *Primula*, speciazione ibridogenica.

Introduction

The stand of a primrose (genus *Primula*) showing morphological features that do not fit any known taxon was discovered in the territory of Chignolo, a hamlet of the municipality of Oneta in "Val del Riso", a lateral valley of the middle Seriana Valley (Marrazzi, 2005). The discovery was made on 8 May 2008 by Sidney Clarke, a Scottish botanist and excellent plant photographer at the locality Bivacco La Plana (m 1235) then later confirmed several times by G. Leoni (member of the Flora Alpina Bergamasca Group) both at the same place (years 2020-2023), and on the ridge of Mount Alben (years 2020-2022). This entity can be interpreted as hybridogenic, characterized by sterility, to be traced back to the parentals *Primula albenensis* Banfi & Ferl. and *P. auricula* L., both widespread and overlapping in the geographical area concerned. *P. albenensis* is present in the upper Val Gerona (Monte Alben) and on limestone faces of Corna dei Castelletti in Valle Secca (Boglioni & Falgheri, 1996). The holotype of the species (housed in FI, acronym follows Index Herbariorum, 2021) coming from "Sce-pa dol Gerù" in the upper Gerona Valley, municipality of Oneta (Banfi & Ferlinghetti, 1993).

Materials and methods

Sampling of both the hybrid under study, and its parental species were conducted in the aforementioned Bivacco La Plana area, accompanied by photographic documentation. The material was examined morphologically to perform the necessary comparisons with the help of a stereomicroscope. Of *P. albenensis* and *P. auricula*, a protologue (Banfi & Ferlinghetti, 1993), some descriptions, and diacritical characters

reported in the main Floras pertaining to the area were examined (Valentine & Kress, 1972; Pignatti, 1982; Pignatti *et al.*, 2017-2019). In addition, the contributions of Zhang & Kadereit (2005), Cristofolini & Crema (2013) were consulted for general considerations on *Primula* sect. *Auricula*.

Taxonomic treatment

The new find, which shares the same habitat of the parental species, is distinguished (Fig. 1) from *P. albenensis* (Fig. 2) and *P. auricula* (Fig. 3) by the yellow corolla throat and a pronounced indentation of the leaf margin, in contrast to the white-farinous corolla throat and the usually entire leaf margin of *P. albenensis* (characters in Table 1). The natural intra-sectional hybrids of *Primula* sect. *Auricula* Duby have several precedents. The last to be discovered, reported under subsect. *Euauricula* Pax, is a cross of *P. recubariensis* Prosser & Scorteg., endemic to Recoaro Terme (Venetian Pre-Alps, province of Vicenza) and *P. auricula* subsp. *ciliata* (W.D.J.Koch) Lüdi, the latter to be regarded as synonym of *P. auricula* L. (POWO, 2023). This nothospecies described as *Primula vallarsae* Prosser & Scorteg. shows features intermediate between parents (Prosser & Scortegagna, 1998; Cristofolini & Crema, 2013) including the diagnostic yellow colouration of the corolla throat inherited from *P. auricula*.

In the present case, the pattern repeats that of *P. albenensis* and in both cases neither “hybrid swarm”, nor introgressive trends as mentioned by Cristofolini & Crema (2013) are observed, confirming in every respect the sterility of the plant, i.e., its hybrid origin. As the cited authors point out, the fitness of such hybrids is reduced, however their chances of success are consolidated in the fact that they possess a pure S biostrategy (Grime, 1998), i.e. the same strategy shared by all species in *Primula* subsect. *Euauricula*. Such a feature, even without generational renewal, gives these entities a precise bio-ecological role, making them potentially deadline-less realities capable of configuring a specialized habitat (limestone rock) in the total absence of competition and gene flow. Therefore, we deem it necessary to provide a nothospecific binomial to this hybrid according to the International Code of Nomenclature (Turland *et al.*, 2018).

Diagnosis

Primula ×*chignolensis* Banfi & Ferl., nothosp. nov.

Hybrid formula: *P. albenensis* × *P. auricula*

Corollae fauce lutea et foliorum margine valde crenato a specie P. albenensis perspicue differt, a specie P. auricula corollae limbo numquam luteo nec foliorum margine umquam albicante.

Distinguished from *P. albenensis* by the corolla with a yellow throat and a definitely crenate leaf margin, from *P. auricula* by the corolla limb never yellow and the leaf margin never whitish-contrasting.

Etymology: from the toponym Chignolo.

Type - *Holotypus*: Herbarium MSNM 52572 (Milano), Pre-Alps of Bergamo, Mount Alben group, Chignolo d’Oneta, Bivacco La Plana, 45.848982 N, 9.802947 E, m 1247, on limestone face, leg. Gianni Borlini, 23.05.2022.

Description

Rosulate herbaceous perennial, acaulescent. Obovate-spatulate, somewhat fleshy leaves, about 3-8 × 2-6 cm, usually distinctly crenate, glandular especially at the margins, more or less farinose on the adaxial surface; margins green, not whitish like *P. auricula*. Flowering stem 5-25(-30) cm, flowers 5-12 in terminal umbel, calyx more or less white-farinose, corolla throat pale yellow, scarcely or not farinose, limb magenta-colored, somewhat darker than in *P. albenensis*. Flowering: April-May.

Tab. 1 - Character table.

	<i>Primula albenensis</i>	<i>Primula</i> × <i>chignolensis</i>	<i>Primula auricula</i>
leaf margin	usually entire to subcrenate or crenate in the distal portion	distinctly and evenly crenate	crenate/subcrenate to subentire
color of leaf	not contrasting (green)	not contrasting (green)	contrasting (whitish)

margin			
corolla throat	copiously white-farinose	pale yellow, not or scarcely farinose	yellow, not or scarcely farinose
corolla limb	magenta (rarely purple or whitish)	magenta to deep magenta	yellow

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Fig. 1 - *Primula* ×*chignolensis* Banfi & Ferl. at Bivacco La Plana. / *Primula* ×*chignolensis* Banfi & Ferl. a Bivacco La Plana. (Photo by: / Foto di Marco Borlini).



Fig. 2 - *Primula albenensis* Banfi & Ferl. at Bivacco la Plana. / *Primula albenensis* Banfi & Ferl. a Bivacco la Plana. (Photo by: / Foto di Sergio Epis).



Fig. 3 - *Primula auricula* L. at Bivacco la Plana. / *Primula auricula* L. at Bivacco la Plana. (Photo by: / Foto di Sergio Epis).