

A NEW VARIETAL COMBINATION IN *CASTILLEJA ARVENSIS* (OROBANCHACEAE)

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ABSTRACT

The new combination ***Castilleja arvensis*** Schltld. & Cham. var. ***pastorei*** (Hicken) J.M. Egger is proposed, based on *C. lithospermoides* Kunth var. *pastorei* Hicken. Var. *pastorei* occurs in northern Argentina and adjacent Uruguay and southern Brazil, at the southern margin of the much wider range of typical *C. arvensis*.

In a recent paper (Egger 2017), I reviewed the taxonomic and nomenclatural history of *Castilleja arvensis* Schltld. & Cham. and provided a lectotype and full synonymy for that species name. In that paper I also presented the rationale for assigning all records determined as *C. lithospermoides* Kunth outside of central Mexico and some specimens from within that region to the widespread *C. arvensis*, as well as supporting the suggestion by Nesom (1992) and T.I. Chuang (annotation label on isotype of *C. lithospermoides* at P, 1993) that the type collection of that entity was synonymous with the Mexico endemic species, *C. scorzonerifolia* Kunth. At that time, I treated *C. arvensis* as a variable but monotypic species, well distinguished from *C. scorzonerifolia* (including some Mexican specimens originally assigned to *C. lithospermoides*) by its annual duration and unique morphological traits. However, after reviewing a number of collections and photographs of plants from south-central South America, it is now clear that one of the named forms I assumed to be indistinguishable from and synonymous with the typical form of *C. arvensis*, actually does deserve formal recognition, based on consistent differences in the coloration of the distal portions of the calyces. This initial oversight resulted from my examination of a unicate type collection obtained in 1911 and lacking its original coloration. This unique form is already described and proposed as a variety of another species (Hicken 1912), thus requiring only the following new combination.

Castilleja arvensis Schltld. & Cham. var. ***pastorei*** (Hicken) J.M. Egger, **comb. nov.** *Castilleja lithospermoides* Kunth var. *pastorei* Hicken, Physis (Rev. Soc. Argentina Cienc. Nat.) 1: 30. 1912. **TYPE: ARGENTINA.** En el Cerro del Ruidito (San Luis), 20 Jan 1911, *F. Pastore s.n.* (holotype: SI!).

An image of the holotype sheet is presented below (Fig. 1), as well as images of live plants of both *Castilleja arvensis* var. *pastorei* (Figures 2–4) and plants of the typical variety (Fig. 5 and Fig. 6). Additional images of the latter and other *Castilleja* species mentioned in the paper can be found in Egger 2018.

Discussion

While its range is incompletely known, specimens and/or photographs of *Castilleja arvensis* var. *pastorei* are known from locations east of the Andes Mountains in Cordoba, San Luis, and Tucumen provinces in northern Argentina and from adjacent Uruguay and southern Brazil. While it appears that this variety is limited to the southern margins of the range of *C. arvensis* as a whole, it is not known if or to what extent it is sympatric with the typical variety. Var. *pastorei* should be looked for in Paraguay and eastern Chile. The typical variety replaces it in northern and central Brazil, as well as in the Andes Mountains to the west.

In Hicken's protologue for var. *pastorei*, it was contrasted with typical *Castilleja lithospermoides* (= *C. scorzonerifolia*), using characters of the leaves and flowers that distinguish both varieties of *C. arvensis* from the Mexico endemic *C. scorzonerifolia*. Though not included in the diagnostic features in the protologue, Hicken did mention the distinctive coloration of the calyces in var. *pastorei*: "... el cáliz, el cual es rojizo é hispido." The varieties can be distinguished from each other by the following couplet:

- 1a. Primary calyx lobes bright to dark greenish var. **arvensis**
 1b. Primary calyx lobes bright to dark reddish var. **pastorei**

The placement of var. *pastorei* within *Castilleja arvensis* is also supported by a chromosome count reported by Páez et al. (2015) of the diploid number of $n = 12$ for plants originally determined by the authors as *C. lithospermoides* but verified as *C. arvensis* var. *pastorei* by an accompanying photograph. As the authors of that paper mentioned, this count does not match the count reported by Heckard (1986) and Chuang and Heckard (1993) of $n = 24$ for *C. lithospermoides* from Mexico. However, examination of all four voucher specimens cited by Chuang and/or Heckard (*Cruden 1180* [LL, MICH, UC]; *Cruden 1320* [UC]; *Cruden 1313* [NY, UC]; *Cruden 1672* [NY, UC]) are actually specimens of *C. nervata* Eastw., and, with one exception, (*Cruden 1180*) they were not found within the range of *C. scorzonerifolia* and the synonymous *C. lithospermoides*. It appears that Chuang and Heckard did not consider *C. nervata* in their analysis of the species complex surrounding *C. scorzonerifolia* and assigned specimens of *C. nervata* to their concept of *C. lithospermoides*, thereby unintentionally adding to the confusion around that name. Moreover, published counts for both *C. arvensis* var. *arvensis* (Heckard 1986; Chuang & Heckard 1993) and *C. scorzonerifolia* (Chuang & Heckard 1993) are $n = 12$. Consequently, while the count by Páez et al. is consistent with its inclusion as a variety of *C. arvensis*, it is not conclusive in separating it from *C. scorzonerifolia*.

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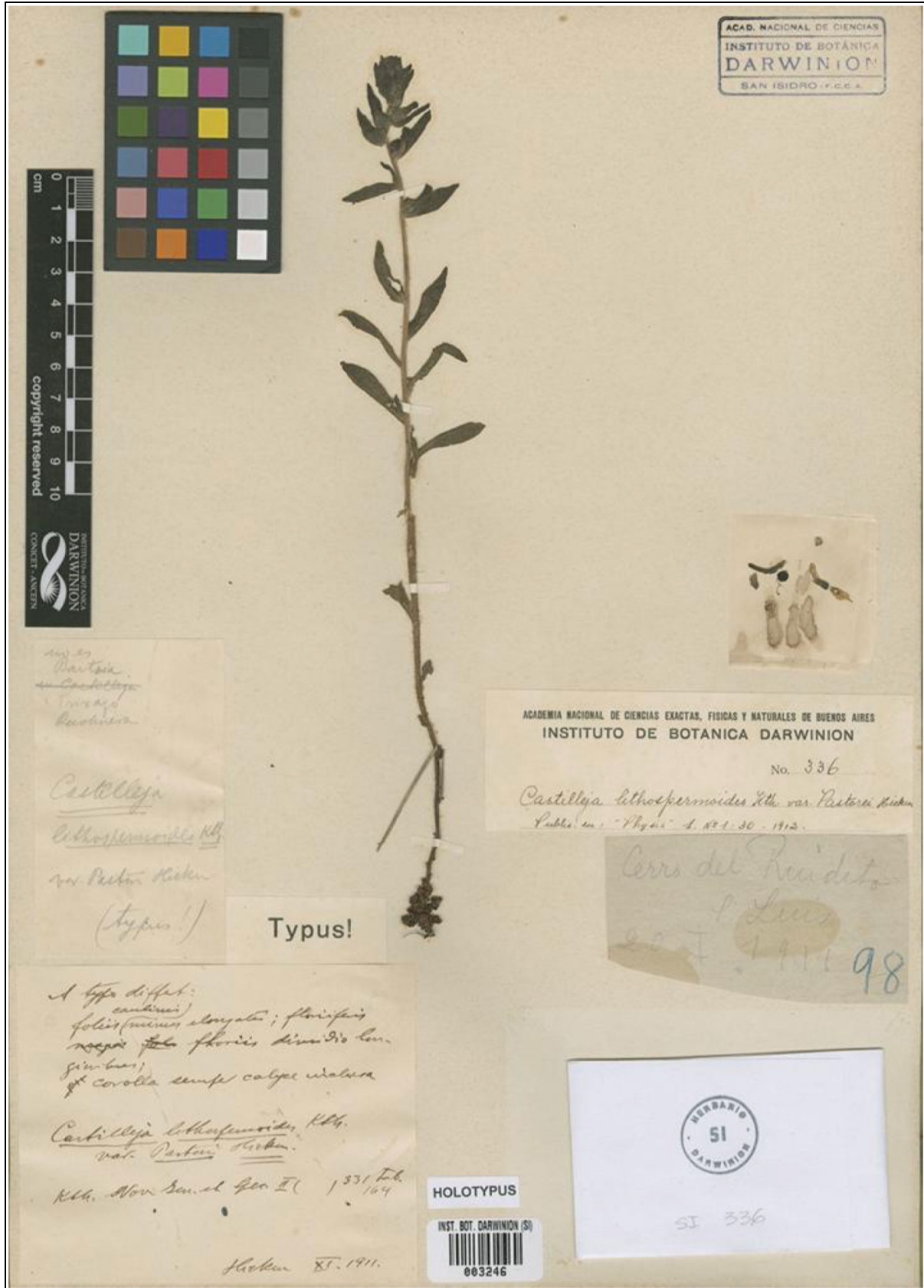


Figure 1. Holotype of *Castilleja lithospermoides* var. *pastorei*, SI.



Figure 2. Two examples of *Castilleja arvensis* var. *pastorei*, from Santa María Department, 4 Nov 2017 (L) and from Cruz del Eje Department, 4 Mar 2012 (R), Prov. Córdoba, Argentina. Photos by A.A. Cocucci.



Figure 3. *Castilleja arvensis* var. *pastorei* from Uruguay, precise location unknown, 9 Dec 2011. Photos by S. Sekarajasingham.



Figure 4. *Castilleja arvensis* var. *pastorei*, Serro de Mar Mountains, Rio Grande do Sul, Brazil, 8 Nov 2011. Photo by P. Zika.



Figure 5. *Castilleja arvensis* var. *arvensis*, east of Agallpampa, Depto. La Libertad, Peru, 16 Apr 2005. Photos by J. M. Egger.



Figure 6. *Castilleja arvensis* var. *arvensis*, Pasachoa Forest Reserve, Pichincha Prov., Ecuador, 13 Jul 1987 (L); Kipuka P'uu O'o, Island of Hawaii, 14 Jul 1999. Photos by J. M. Egger.