**Weberbauerella chilensis** (Fabaceae: Papilionoideae), a new species from the Atacama Desert, Chile

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**Abstract**

A new legume species, *Weberbauerella chilensis*, from the Andean foothills in the Tarapacá region in Chile, is described and illustrated. This species represents the first record of the genus in Chile and the Southern Cone of South America and is the third species described for the genus. *Weberbauerella chilensis* resembles *W. brongnartioides* from Peru, but differs primarily in its smaller size, fewer leaflets and habitat conditions.

**Key words:** Chile, Tarapacá, Perú, new taxon, *Weberbauerella*, Atacama Desert

**Introduction**

During several field flora studies in the Andean foothills of northern Chile, a Fabaceae-Papilionoideae species was collected that did not belong to any genus known to occur in Chile (Muñoz-Pizarro 1966, Marticorena & Quezada 1985, Marticorena 1990) nor to any other known genus in the Southern Cone of South America (Zuloaga et al. 2008a, b). Instead, the morphological features of these specimens indicate that it is a member of the Peruvian genus *Weberbauerella* Ulbrich (1906: 551).

The genus *Weberbauerella* was erected with *Weberbauerella brongnartioides* Ulbrich (1906: 551), based on specimens that Weberbauer collected in 1902 in areas associated with the Lomas formation (oasis de neblina in Chile) on the southern Peruvian coast near Mollendo. *Weberbauerella raimondiana* Ferreyra (1951: 2), was the second species described within the genus. This species is also associated with the Lomas formation and is found near Chala on the Peruvian coast. This genus, characterized by the presence of pustular glands on stems, leaves and flowers, one or few tubers and subshrub or herbaceous habit, has been considered, until now, to be the only Fabaceae genus that is endemic to Peru and its only two known species are considered endangered (Baldeón et al. 2006). *Weberbauerella* has been treated within the subtribe Poiretiinae (tribe Aeschynomeneae), together with genera *Amicia* Kunth, *Poiretia* Vent. and *Zornia* J.F.Gmel. (Rudd 1981). However, currently, and based on molecular analysis of the "dalbergioid legumes", these genera form a monophyletic group within the clade *Adesmia*, phylogenetically separated from *Weberbauerella* (Lavin et al. 2001), which is considered an isolated genus within the Dalbergia clade of the tribe Dalbergieae s.l. (Klitgaard & Lavin 2005).

Although the *Weberbauerella* specimens collected in Chile perfectly align with Ulbrich’s (1906) description of the genus, their morphological, geographical, and environmental differences from the two known species of *Weberbauerella* are substantial enough to recognize a third, presently undescribed species of this genus.
Taxonomy

*Weberbauerella chilensis* Faúndez & Saldivia, sp. nov. (Fig. 1–2)

_Haec species W. brognartioides similaris, sed differ per suam minoris formae (10–15 non 25–30 cm), prostratus non erecti habitus; paria foliolis minus (7–12 non 17–20); forma foliolis (linearibus-ellipticis, non ovalibus) et apicem mucronatus, non truncatus vel emarginatus._

_Type:_—CHILE. Tarapacá: Comuna de Pica, Camino a Salar del Huasco, 3600 m, 31 March 2008, _L._ Faúndez & _B._ Larraín s.n. (holotype SGO 162972!, isotypes SGO 162973!, CONC 177641!).

_Herbaceous perennial, ephemeral. Tubers deep underground, one or several, spherical or oval, blackish brown, 2–4 × 2–4 cm. Plant prostrate, notably branched from the base, 10–15 cm high, 30 cm in diameter; branches zigzag, up to 15 cm long, smooth, densely sericeous-pubescent, with scattered dark glands, internodes 15–20 mm long in mature branches. Leaves imparipinnate; stipules caducous, linear-lanceolate, 4–5 mm long, 0.7 wide at the base, white-hairy with hairs to 1 mm long, abaxial side also covered with scattered dark pustular glands; petioles 0.5–1 cm long, base and adaxial side densely covered with up to 0.5 mm long white hairs; leaflets 7–12 pairs, terminal leaflet caducous, 1–1.7 cm long, 5–7 mm wide, linear-elliptic, base obtuse, margin entire, apex acute, shortly mucronate, glandular, adaxial surface eglandular, pubescent, abaxial surface with sparse pubescence, numerous flat to depressed glands, 0.5 mm long whitish hairs. Inflorescence a raceme, 2–5-flowered; rachis 2–3 cm long. Flowers zygomorphic, papilionoid, 13–18 mm long; pedicel 5–10 mm long. Calyx strongly bilabiate, glandular, pubescent with trichomes short, antrorse, whitish; upper lip bilobed, lobes 4 × 3.5 mm, oblong, apex rounded; lower lip three-lobed, lobes 5 × 1.5 mm, linear-lanceolate, apex of lateral lobes acuminate, apex of central lobe acute to obtuse. Standard petal, 15 × 15 mm, base unguiculate, yellow-green, intermediate zone purplish, margin whitish, nerves dichotomously branching toward the margin or occasionally anastomosing, pubescent glands slightly convex, brownish, concentrated and larger towards the base; wing petals, 10 × 8 mm, slightly obovate, base auriculate, unguiculate, apex obtuse, white-purple, inter nervs with grooves on the lower half, pubescent glands few and scattered; keel 16 × 8 mm, claw 2 mm long, base strongly auriculate, auricle 1.5 mm long, slightly unguiculate, inner margin irregularly notched, apex obtuse, whitish, the outer face with numerous prominent glands. Stamens 10, filaments united in basal half, 16–18 mm long, 15 mm wide, glabrous; anthers 1.3 mm long. Gynoecium 20 mm long, base stipitate, ovary moniliform, slightly arched upwards, 11 × 0.7 mm at the seminal portion, 0.3 mm wide between the ovules, 4–6 sepatate, margin hairy, seminal portion glandular, style 9 mm long, cylindrical, glabrous, stigma punctiform. Legume shortly pedunculate, 15–16 mm long not including the remains of the style, articles 4–6 (2–3 with complete development and the remaining underdeveloped), 4–6 × 4 mm, circular to elliptic, margin slightly hairy, conspicuously dotted-glandular; seeds one per article, 3 × 2.2 mm, reniform, laterally flattened, black, glabrous, glossy.

_Habitat and distribution:_—*Weberbauerella chilensis* is found in the Atacama Desert in the Tarapacá region on a narrow altitudinal strip in the upper boundaries of absolute desert. This species grows on sandy soils between 2500 to 3600 meters altitude. It only appears above ground after precipitation, which is infrequent and irregular. *Weberbauerella chilensis* grows in open habitats that include other annual or geophyte ephemeral herbaceous species such as _Metharme lanata_ Phil. (Zygophyllaceae), _Nolana tarapacana_ (Phil.) I.M.Johnst. (Nolanaceae), and _Tiquilia grandiflora_ (Phil.) A.T.Richardson (Boraginaceae).

_Etymology:_—The specific epithet refers to Chile, where _W. chilensis_ is found.

_Phenology:_—Flowering from September to March.

_Conservation Status:_—*W. chilensis* can be considered as Endangered (EN) under the IUCN (2012) categories and criteria B1ab(iii), since it is known only from a few locations and has a small area of occupancy, and because habitat loss is a latent threat, mainly from mining expansion.

_Additional specimens examined (paratype):—CHILE. Tarapacá: Comuna de Pica, Quebrada Choja, 2440 m, 8 September 2012, _L._ Faúndez, _F._ Larraín & _M._ Escobar s.n. (SGO 163429!, CONC 177642!).

_Additional specimens examined (related taxa):—*W. brognartioides*: PERU. Mollendo: solo arenoso parce plantis compto ad marginem inferiorem formationis, quae "Loma"dicitur in altitude 100–200 m, 4 October 1902, _A._ Weberbauer 1513 (holotype B!, isotype F!). _W. raimondiana_: PERU. Arequipa: near Chala, province of Camaná, 300–400 m, 14 November 1949, _R._ Ferreyra 6498 (holotype US!, isotype US!).
Discussion:—The diagnostic characters of the genus *Weberbauerella* are mainly the presence of one or more deep tubers, stems, leaves and flowers densely covered with pustular glands, and imparipinnate leaves (Ulbrich 1906) with more than 40 leaflets (Lavin *et al.* 2001). The number of leaflets is not a morphological character mentioned in the protologue of the genus, however it is one of the diagnostic characters established here for *W.*
WEBERBAUERELLA CHILENSIS, since this taxon has a lower number of leaflets (14–24) than the other species. Table 1 shows this and the other most important diagnostic morphological characters for the three species of Weberbauerella.

**TABLE 1.** Differences between *W. chilensis*, *W. brongnartioides* and *W. raimondiana*.

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>W. chilensis</em></th>
<th><em>W. brongnartioides</em></th>
<th><em>W. raimondiana</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>10–15 cm</td>
<td>25–30 cm</td>
<td>22–35 cm</td>
</tr>
<tr>
<td>Habit</td>
<td>Herbaceous, prostrate</td>
<td>Subshrub, erect</td>
<td>Subshrub, erect</td>
</tr>
<tr>
<td>Florets per inflorescence</td>
<td>2–5</td>
<td>5–8</td>
<td>6–8</td>
</tr>
<tr>
<td>Pairs of leaflets per leaf</td>
<td>7–12</td>
<td>17–20</td>
<td>22–32</td>
</tr>
<tr>
<td>Leaflet apex</td>
<td>Acute, shortly mucronate, glandular</td>
<td>Obtuse, truncate or emarginate, glandular</td>
<td>Obtuse, rarely acute and mucronate, glandular</td>
</tr>
<tr>
<td>Leaflet size</td>
<td>10–17 × 5–7 mm</td>
<td>6–20 × 3–14 mm</td>
<td>2–7.5 × 1.6–4 mm</td>
</tr>
<tr>
<td>Leaflet shape</td>
<td>Linear-elliptic</td>
<td>Ovate</td>
<td>Ovate-elliptic</td>
</tr>
<tr>
<td>Elevation</td>
<td>2,500–3,600 m</td>
<td>20–300 m*</td>
<td>300–400 m*</td>
</tr>
</tbody>
</table>

*: Baldeón et al. (2006).

**FIGURE 3.** Distribution map of the genus *Weberbauerella*. Square: type locality of *W. raimondiana*. Circle: type locality of *W. brongnartioides*. Triangles: Know localities of *W. chilensis*. 
Figure 3 shows that the known populations of *W. chilensis* are located ca. 600 km from its two congeneric species, which are only known from the area close to their type localities. In addition, there are large environmental differences between the species. *Weberbauerella brongnartioides* and *W. raimondiana* are endemics restricted to Lomas formations below 400 m at the arid desert coast (León et al. 1996) in southern Perú (Baldeón et al. 2006). These two species are located phytogeographically within the Arequipeño sector (Galan de Mera et al. 1997) and have a marked dependence on ENSO events (El Niño-Southern Oscillation) for their proper development. In contrast, *W. chilensis* is a pre-Andean desert element in habitats under a strong influence of ‘La Niña’ events, which is an inverse climatic phenomenon.

Acknowledgements

We acknowledge José Roque for his assistance in providing the original publication of *W. raimondiana* and Aníbal Fernández and Hugo Rojas from TECK Corporation for allowing us to publish the information collected as a result of a private environmental study. Daniel Martínez and Gustavo Saldivia generated figures 1 and 3, respectively, and Marcos Martínez, Pablo Sandoval and Gabriela Luna helped us with the manuscript. Finally we would like to thank Pieter Pelser for providing feedback on an earlier draft of the manuscript and Dr. Vidal de Freitas Mansano for his suggestions that helped to improve the manuscript and for sending specific literature. The original description of *Weberbauerella brongnartioides* was obtained from the Biodiversity Heritage Library website (www.biodiversitylibrary.org) and type specimens of *W. brongniartioides* and *W. raimondiana* were studied using the Global Plants Platform website (plants.jstor.org) through University of Chile.

References


