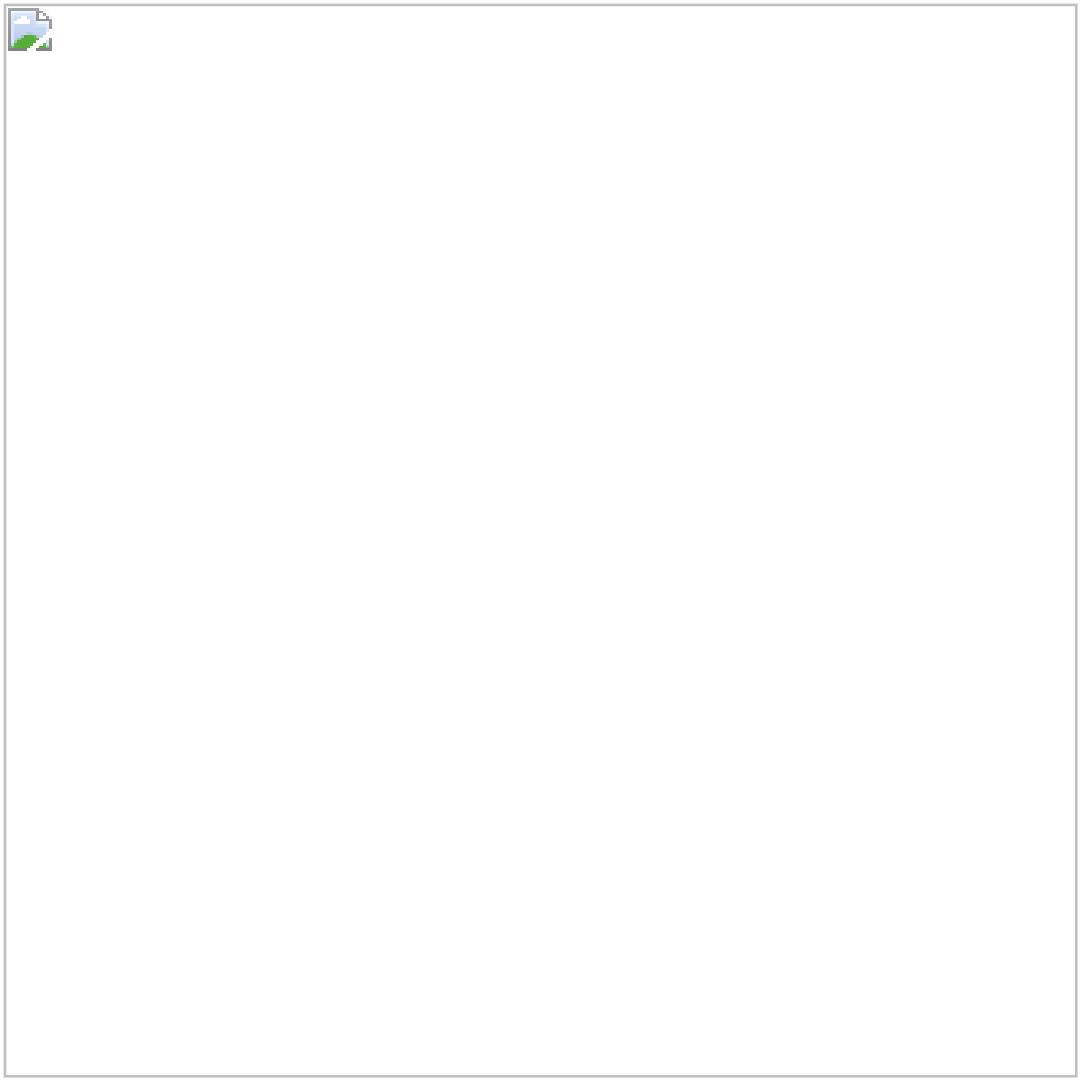

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Taxonomic Reevaluation of the *Polylepis sericea* Complex (Rosaceae), with the Description of a New Species

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Abstract—The taxonomically difficult genus *Polylepis* (Rosaceae) contains several problematic species complexes, including one around *P. sericea.* We here reevaluate species boundaries in this complex based on morphological characters and climatic niches. We recognize five species within the *P. sericea* complex, based primarily on leaf characters: *P. albicans* (northwestern Peru), ***P. argentea*** (central Peru) described here, *P. canoi* (southeastern Peru to central Bolivia), *P. ochreata* (Ecuador to southernmost Colombia), and *P. sericea* (Venezuela to central Colombia). We provide full synonymy, diagnostic notes, lists of selected specimens examined, and a key to the species of the complex.

Resumen—*Polylepis* (Rosaceae) es un género taxonómicamente difícil que contiene varios complejos de especies problemáticos, incluyendo uno alrededor de *P. sericea*. Aquí reevaluamos los límites de las especies en este complejo basado en sus caracteres morfológicos y nichos climáticos. Reconocemos cinco especies dentro del complejo *P. sericea*, basado principalmente en caracteres de la hoja: *P. albicans* (noroeste Perú), ***P. argentea*** (Perú central) que es descrita aquí, *P. canoi* (sudeste de Perú a Bolivia central), *P. ochreata* (Ecuador a sudeste de Colombia) y *P. sericea* (Venezuela a Colombia central). Proporcionamos sinonimia completa, notas diagnósticas, lista de especímenes seleccionados examinados, y una clave a las especies del complejo.

Keywords—Andes, morphology.

The genus *Polylepis* Ruiz & Pav. (Rosaceae) is distributed along the Andes from western Venezuela to northern Chile and central Argentina (Bitter 1911; Simpson 1979; Kessler 1995a, 1995b; Hensen 2002). In much of the Andes, species of *Polylepis* form the upper treeline, reaching almost 5000 m elevation in Bolivia and Peru (Hoch and Körner 2005; Sylvester et al. 2017). However, due to millennia of land use, *Polylepis* forests are among the most endangered ecosystems in the Andean highlands (Hensen 2002; Mendoza and Cano 2012).

Despite its ecological importance, the taxonomy of *Polylepis* remains poorly understood. Taxonomically, the genus is difficult because on the one hand many species are morphologically quite similar, while on the other hand there is often considerable morphological variation within species. This variation can be found both within populations growing in microhabitats with different water supply (Kessler 1995b) and between geographical populations of the same species (Simpson 1979). Furthermore, there is evidence of hybridization (Romoleroux 1996) and polyploidy in the genus (Schmidt-Lebuhn et al. 2010; Kessler et al. 2014). Apomixis has not yet been documented in *Polylepis*, but considering the number of genera in the family Rosaceae among which apomixis is common (e.g. *Alchemilla* L., *Crataegus* L., *Rubus* L., *Sorbus* L.), it may well occur.

For all these reasons, the delimitation of the species of *Polylepis* has seen numerous significant changes over time. In the first taxonomic revision of the genus, Bitter (1911) recognized 38 species with many infraspecific taxa. Several additional species were described in the subsequent decades until Simpson (1979) produced a new monograph of the genus, reducing the number of species to 15. She also proposed a classification placing the species into three groups: the *sericea*, *reticulata,* and *incana* groups. This group classification is still being used in the genus (Schmidt-Lebuhn et al. 2010; Segovia-Salcedo et al. 2018). However, later authors have used narrower species delimitations, increasing the number of recognized species to 26 overall (Kessler and Schmidt-Lebuhn 2006) and 20 for Peru alone (Mendoza and Cano 2012).

Among the species recognized by Simpson (1979), *Polylepis sericea* Wedd. was defined by having, among other traits, inflorescences with eight to 35 flowers, spiny fruits, two to six pairs of leaflets, and dense, evenly distributed sericeous hairs on the leaflet undersides. With populations from Venezuela to Bolivia, it was the most widely distributed species in the genus, but as defined by Simpson (1979), it was also one of the morphologically most variable species. The uncertainty surrounding this species complex is in part due to the brief protologue provided by Weddell (1857) for *Polylepis sericea*. In his revision of the genus, Bitter (1911) stated that Weddell's original description does little justice to the diagnostic characters of this species, so that mistakes in the determination of other material are unavoidable. Bitter recognized the following five species within the complex: *P. albicans* Pilg., *P. hypargyrea* Bitter, *P. ochreata* (Wedd.) Bitter, *P. sericea*, and *P. stuebelii* Hieron. However, his recognition of these was based on limited herbarium material, making it difficult to assess variation within and between populations. Based on extensive field experience and study of many more herbarium specimens than available to Bitter (1911), Simpson (1979) observed substantial variation within populations and recognized a broadly defined species *P. sericea.* This treatment was followed by, e.g. Romoleroux (1996) for Ecuador and by Kessler (1995a, b) for Bolivia. However, Mendoza (2005) described a new species, *P. canoi* W.Mend., from central Peru because of its sympatric co-occurrence with *P. sericea.* In their treatment of the Peruvian species of *Polylepis,* Mendoza and Cano (2012) thus recognized these two species as distinct.

In 2006, TEBE collected a species of *Polylepis* in central Peru that she initially considered to be *P. canoi* since it differed from plants from Cuzco department, Peru, that she knew as *P. sericea.* Later, the same species was collected by HRQM who consulted TEBE and MK as to its identity. Closer examination

of the specimens convinced us that it was not *P. canoi* and that indeed the Cuzco plants known by TEBE as *P. sericea* and those previously assigned by MK to *P. sericea* from Bolivia (Kessler 1995b, Kessler and Schmidt-Lebuhn 2006) actually are conspecific with *P. canoi*. This obvious confusion of species identities within the species group around *P. sericea* led us to conduct a detailed study of the species complex in the field and in herbaria, based on morphological traits, climatic niche differences, and geography. We here present the results of this taxonomic reevaluation of the *Polylepis sericea* complex, recognizing five species of which one is described as new.

Materials and Methods

Morphological Analysis—This study is based primarily on the examination of the external morphology of herbarium specimens, supplemented with observation of rehydrated material, photographs, and living plants in the field. We have chosen characters for measurements based in part on those that have been previously used to differentiate species within the genus *Polylepis* (Table 1; Bitter 1911; Simpson 1979; Romoleroux 1996; Kessler 1995b; Mendoza and Cano 2012). We examined a total of 276 specimens (including type material) from the herbaria AAU, COL, CUZ, F, GOET, MERF, MO, NY, US, USM, VEN, and Z/ZH, and the material available on JSTOR (https://plants.jstor.org/) and other online herbaria (COL, F, NY, and US). The terminology used for describing the morphological characteristics of the species was based on Simpson (1979), Hickey and King (2000), and Stearn (2004).

Geographic Distributions—We created the distribution maps using QGIS 2.18.14 (Quantum GIS Development Team) using the coordinates on the herbarium specimens. When coordinates were not given on the herbarium labels, we georeferenced the localities.

Environmental Data Analyses—As climatic variables, we extracted Mean Annual Precipitation (MAP) and Mean Annual Temperature (MAT) from CHELSA v. 1.2 (Karger et al. 2017) using the specimen coordinates (see above) as data points. All analyses of climatic data were undertaken in R v. 3.0.5 using the functions of the R packages "devtools" and "easyGgplot2" to assess and visualize differences between species in relation to climatic variables. The function boxplot was used as an exploratory tool to detect and illustrate environmental preferences within *P. sericea* complex. We analyzed the variance on the environmental variables in the species of the complex using ANOVA to assess if climatic niches differed significantly between species, followed by Tukey HSD tests to determine the significant differences among the species of the complex.

Conservation Status—We used the package ConR (Dauby 2018) to estimate the geographical range parameters for a preliminary assessment of the conservation status following Criterion B of the International Union for Conservation of Nature (IUCN 2015, see <http://www.iucnredlist.org>).

Taxonomic Treatment

Concepts of Species Delimitation—Bitter (1911) used a typological species concept in which specimens that were morphologically different from each other were assigned to different species. Based on many more herbarium collections, Simpson (1979) had a better idea of the natural variability of the species and used the biological species concept, which helped her to reduce the number of species that had been recognized until that time.

The species concept used here is the general lineage concept of De Queiroz (1998), in which a species is a segment of an evolutionary lineage at the population level. The species criterion we used is that of phenetic similarity (Davis and Heywood 1973), with discontinuities that may reflect geographical, ecological, and/or reproductive isolation. In *Polylepis*, species identification is ideally based on a series of specimens of a population rather than on single herbarium collections, since even within a single plant leaf size, texture, shape, and indumenta can vary depending on the position on the tree (sun or shade) and the developmental stage of the branch. Thus, some specimens from a population can always phentotypically approach individuals from another species. We do not take this as an indication of several species co-occurring, but rather as an indication of the phenotypical variability and overall similarity of the species.

Climatic Niches in the Polylepis sericea Complex—We found that in addition to morphological characters, species also differ with respect to their climatic niches (Fig. 1). Indeed, we found significant differences with relation to either Mean Annual Temperature (MAT) or Mean Annual Precipitation (MAP) between most species. *Polylepis albicans* is the ecologically most distinct species, growing in drier habitats (382.6–1097.2 mm MAP) than the other four species. *Polylepis sericea* in turn grows under lower temperatures (mean of 1.6°C MAT) than the other species, except *P. albicans*. The other three species have broadly overlapping climatic niches, although the two sympatric species *P. argentea* and *P. canoi* differ from each other in their humidity preferences, with *P. canoi* growing in substantially more humid habitats. These apparent climatic differences between species are not simply the result of

Table 1. Summary of quantitative and qualitative characters that separate species in the *P. sericea* complex.

Character	*P. albicans*	*P. argentea*	*P. canoi*	*P. ochreata*	*P. sericea*
Number of leaflet pairs	4–5	3	3–4(5)	5–8	3–4
Leaf length (cm)	3.5–4.9	(2.9)3.3–4.3	(4.0)7.9–9.4	4.3–7.0	3.9–4.2
Leaf width (cm)	(2.5–)2.8–3.4	(2.6)3.3–4.3	(4.2)6.7–7.5	3.4–4.0	2.5–3.8
Rachis	Densely sericeous	Densely sericeous	Densely sericeous	Sparsely sericeous	Glabrous
Leaflet shape	Elliptic	Narrowly elliptic	Obovate	Narrowly elliptic	Elliptic
Leaflet length (cm)	1.4–2.0	(1.9)2.4–2.6	(2.4)3.4–3.9	1.8–2.7	1.8–2.1
Leaflet width (cm)	0.4–0.7	0.5–0.7	(0.8–)1.1–1.5	0.5–0.7	0.8–1.0
Leaflet margin	Crenulate	Entire	Entire–slightly serrate	Crenate–slightly crenate	Entire
Leaflet apex	Emarginate	Acute–slightly retuse	Slightly emarginate	Emarginate	Emarginate–retuse
Leaflet hairs (upper surface)	Glabrous–sparsely sericeous	(Glabrous with few trichomes mid vein) Densely sericeous	Glabrous–sparsely sericeous	Glabrous–sparsely sericeous	Glabrous
Leaflet hairs (lower surface)	Densely sericeous	Densely sericeous	Densely sericeous	Sparsely sericeous	Densely sericeous
Leaflet hair length (mm)	0.3–0.5	0.6–0.9	1.3–1.7	0.9–1.2	0.7–1.0
Inflorescence length (cm)	3.9–6.6(7.5)	7.2–8.1	8.2–14.5	5.8–13.0	3.3–4.5
Number of flowers	18–21	5–6(9)	12–17(26)	(16)21–43	9–15
Number of stamens	7–18	7–10	13–15	9–15	13–15
Style length (mm)	1.4–3.2	2.7–4.4	2.4–3.8	1.9–2.5	1.9–2.5

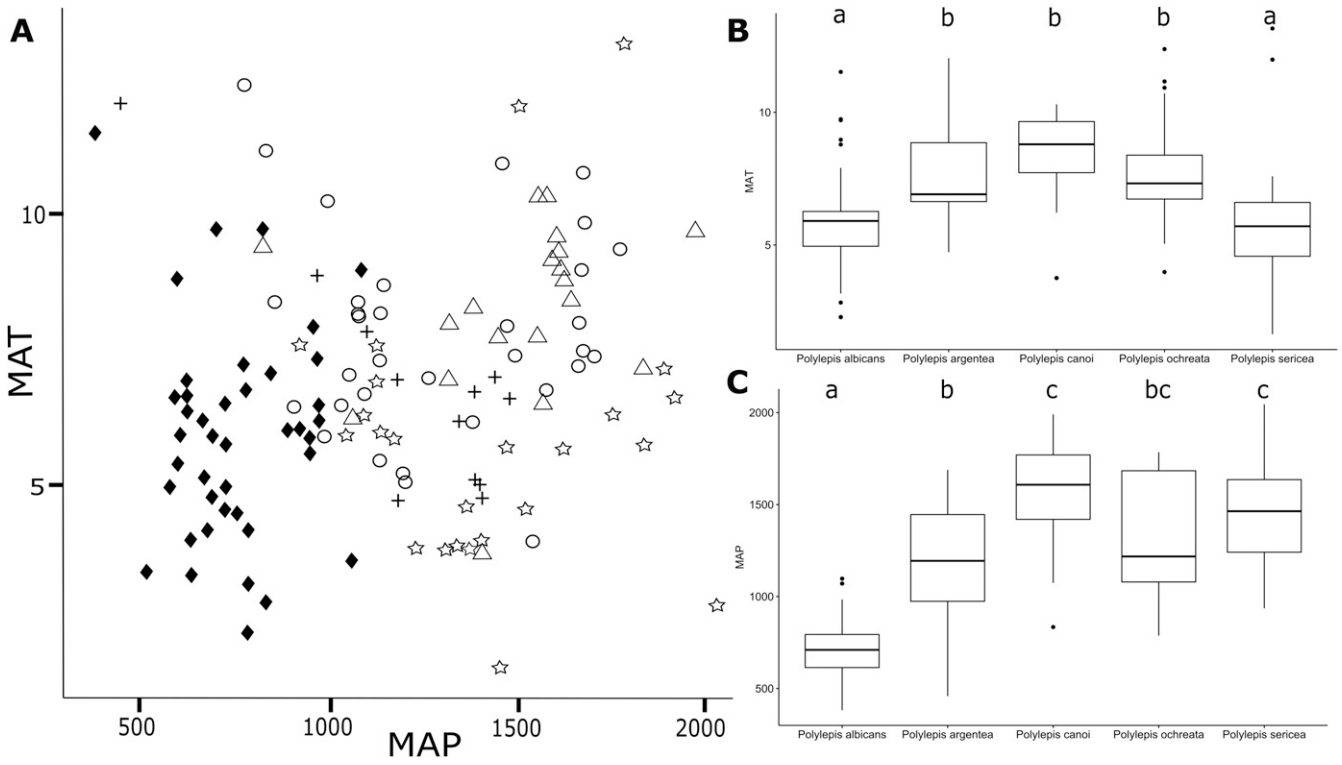

FIG. 1. A. Scatter plot of the *Polylepis sericea* complex in relation to mean annual temperature (MAT) and mean annual precipitation (MAP): *P. albicans* (diamond), *P. argentea* (cross), *P. canoi* (triangle), *P.ochreata* (circle), *P. sericea* (star). B–C. Box plots showing the climatic niches of the species in relation to MAT (B) and MAP (C). The ends of each box represent the upper and lower quartiles and the median is indicated with a bold line inside the box; the whisker lines extend to the highest and lowest observations, except when observations are higher or lower than the interquartile range (i.e. outliers), in which case they are indicated by a circle. Box plots that share the same lowercase letters are not significantly different at $p = 0.05$.

geographical variability related to the distribution of the species. For example, *P. canoi* grows within a few kilometers of much drier habitats yet has not been found in them. We thus conclude that the climatic niche differences correspond to actual differences in climatic preferences between the species.

KEY TO THE SPECIES OF THE *POLYLEPIS SERICEA* COMPLEX

1. Leaflets (2.4)3.4–3.9 × (0.8)1.1–1.5 cm; hairs of lower leaflet surfaces yellowish, 1.3–1.7 mm long; Peru and Bolivia . . . . . *P. canoi* W.Mend.
1. Leaflets 1.4–2.7 × 0.4–1.0 cm; hairs of lower leaflet surfaces silky, whitish, 0.3–1.2 mm long; Venezuela to central Peru 2
2. Leaflets 5–8 pairs; hairs of lower leaflet surfaces sparse; inflorescences 5.8–20.0 cm long, with (16)21–50 flowers; Ecuador and southernmost Colombia . . . . . *P. ochreata* (Wedd.) Bitter
2. Leaflets 3–5 pairs; hairs of lower leaflet surfaces dense; inflorescences 3.9–8.1 cm long, with 5–21 flowers; Venezuela, Colombia, Peru 3
3. Leaflets 4–5 pairs, with crenulate margins; hairs on lower leaflet surfaces 0.3–0.5 mm long; inflorescences with 18–21 flowers; northwestern Peru . . . . . *P. albicans* Pilger
3. Leaflets 3–4 pairs, with entire margins; hairs on lower leaflet surfaces 0.6–1.0 mm long; inflorescences with 5–15 flowers; Venezuela, Colombia, central Peru 4
4. Leaflets (1.9)2.4–2.6 × 0.5–0.7 cm; upper leaflet surfaces with sparse to dense, sericeous hairs; inflorescences 7.2–8.1 cm long; central Peru . . . . . *P. argentea* T.Boza & H.Quispe
4. Leaflets 1.8–2.1 × 0.8–1.0 cm; upper leaflet surfaces glabrous; inflorescences 3.3–4.5 cm long; Venezuela and Cordillera Central of Colombia . . . . . *P. sericea* Wedd.

1. POLYLEPIS ALBICANS Pilger, Bot. Jahrb. Syst. 37: 535. 1906. TYPE: PERU. Ancash, Cordillera Blanca above Caraz, Jun 1903, *Weberbauer 3229* (holotype: B destroyed, photograph in F!, GH!, NY!).

Trees 3–7 m tall. **Leaves** strongly congested at the branch tips, imparipinnate with 4–5 pairs of leaflets, obtrullate in outline, 3.5–4.9 × (2.5–)2.8–3.4 cm; rachises densely sericeous, points of leaflet attachment with a tuft of long, straight hairs, with ferruginous resin at leaflet insertion; stipular sheaths apically acute with spurs, densely sericeous on the outer surfaces; leaflets elliptic in outline, second pair from the terminal leaflet the largest, one of this pair 1.4–2.0 × 0.4–0.7 cm; margin crenulate, coriaceous, apically emarginate, basally unequally cordate; upper leaflet surfaces glabrous or sparsely sericeous; lower leaflet surfaces densely sericeous with short silky hairs 0.3–0.5 mm. long. **Inflorescences** pendent, 3.9–6.6(7.5) cm long, bearing 18–21 flowers; floral bracts 5.5–6.9 mm long, narrowly triangular, densely sericeous on the outer surface; rachises sericeous. **Flowers** 3.4–7.5 mm diam; sepals 3–4, ovate, green, densely sericeous outside; stamens 7–18, anthers orbicular, with a dense tuft of straight white hairs on the upper half; styles fimbriate, 1.4–3.2 mm long. **Fruits** turbinate, with variable numbers and placement of flattened spines, densely sericeous; 3.1–5.6 × 2.3–5.6 mm, including spines.

Distribution and Habitat—*Polylepis albicans* occurs in northwestern Peru in the Cordillera Blanca in Ancash and in the adjacent high Andes of La Libertad. It grows in

semi-humid montane forest at 3200–4800 m elevation, often alongside *P. weberbaueri* (Fig. 2).

Conservation Status—The extent of occurrence (EOO) for *Polylepis albicans* is estimated as 13,028 km^2, the area of occupancy (AOO) is assessed at 156 km^2, and it occurs at 24 locations. It has been collected in Huascaran National Park, which encompasses almost the entire Cordillera Blanca, so it does not seem to be under direct threat. Therefore, it would likely qualify for the Least Concern (LC) or Near Threatened (NT) category according to IUCN (2015) criteria and categories.

Notes—This species was described by Pilger (1906) based on material from Caraz, Cordillera Blanca, Peru. It was placed under *Polylepis sericea* by Simpson (1979) who mentioned that populations of *P. sericea* from the Cordillera Blanca are distinct by having leaflets with pronounced pubescence in both sides. We here argue that based on its distinct morphology and ecology, this taxon should be reinstated at species level. *Polylepis albicans* differs from *P. sericea* by a sparse to dense sericeous hair cover on the upper leaflet surfaces and on the leaf rachises (vs. glabrous in both cases in *P. sericea*), shorter hairs (0.3–0.5 mm vs. 0.7–1.0 mm), and commonly reddish glandular hairs at leaflet bases (lacking in *P. sericea*). Occasionally, specimens of *P. albicans* resemble those of *P. argentea* in leaflet shape, but leaflet margins are crenulate in *P. albicans* and entire in *P. argentea*. Further, *P. argentea* differs from *P. albicans* by the lower number of flowers in the inflorescence (5–9 vs. 18–21).

***Additional Specimens Examined*—Peru.**—Ancash: Road from Yungay to Yauyos, vicinity of Lagunas Llanganuco, open *Polylepis* forest, 09°02′S 077°35′W, 10 Jul 1982, *A. H. Gentry et al. 37376* (MO, USM); 1901–1929, *A. Weberbauer 3229* (B, MO); Cordillera Blanca near Ingenio in upper Pumapampa Valley, 11°04′S 077°36′W, 15 Feb 1987, *D. Boertmann 53* (AAU); Parque Nacional Huascarán: Llanganuco, 11 Jul 1982, *E. M. Zardini 1535* (MO); Llanganuco Valley, 09°00′S 077°30′W, Aug 1959, *J. Compton Tothill 174* (F); Cordillera Blanca, Laguna Paron, 30 km NE of Caraz in northern Huascaran National Park, 10 Oct 1988, *L.W. Peterson s.n*. (MO); Llanganuco, 29 Nov 2007, *B. Lasermann II/1* (USM); Quebrada Paron, Cordillera Blanca (West of L. Paron), 09°00′S 077°41′W, 18 Aug 1988, *O. Frimer & S. M. Nielsen 042* (AAU), *043* (AAU), *044* (AAU), *059* (AAU); Quebrada Carhuasccancha, Cordillera Blanca, 09°29′S 077°15′W, 15 Oct 1988, *O. Frimer & S. M. Nielsen 132* (AAU); Quebrada Matará in Quebrada Ulta, Cordillera Blanca, 09°07′S 077°32′W, 03 Sep 1988, *O. Frimer & S. M. Nielsen 104* (AAU); Quebrada Paron, Cordillera Blanca (W of L. Paron), 09°00′S 077°41′W, 18 Aug 1988, *O. Frimer & S. M. Nielsen 045* (AAU); Quebrada Ishinca, Cordillera Blanca, 09°23′S 077°28′W, 23 Aug 1988, *O. Frimer & S. M. Nielsen 073* (AAU); Quebrada Ulta, Cordillera Blanca, 09°06′S 077°32′W, 02 Sep 1988, *O. Frimer & S. M. Nielsen 107* (AAU), *108* (AAU); Quebrada Rurec, Cordillera Blanca, 09°25′S 077°17′W, 11 Oct 1988, *O. Frimer & S. M. Nielsen 125* (AAU), *126* (AAU); Quebrada Rurichinchay, Cordillera Blanca, 09°21′S 077°18′W, 06 Oct 1988, *O. Frimer & S. M. Nielsen 118* (AAU), *123* (AAU); Quebrada Ishinca, Cordillera Blanca, 09°23′S 077°28′W, 23 Aug 1988, *O. Frimer & S. M. Nielsen 070* (AAU), *071* (AAU), *074* (AAU), *099* (AAU), *101* (AAU); Cordillera Blanca. 35 km east of Yungay, 05 Apr 1988, *S. A. Renvoize & S. Lægaard 5074* (AAU, MO); 40 km east of Yungay, 05 Apr 1988, *S. A. Renvoize & S. Lægaard 5088A* (AAU), *5088B* (AAU); Cordillera Blanca. East of Yungay. Laguna de Llanganuco, 05 Apr 1988, *S. A. Renvoize & S. Lægaard 5066* (AAU), *5075* (AAU); Carhuaz. Huascarán National Park; Quebrada Ulta, north side of valley. Shrubland-grassland mosaic with scattered Polylepis sericea trees; S- facing, moderate to gentle slopes; soils of morainal origin, 09°07′S 077°32′W, 29 Jul 1985, *D. N. Smith 11410* (MO, USM); Huascarán National Park. N-side of main valley, Quebrada Honda. Brushfields with a few open stands of *Polylepis sericea*, 09°18′S 077°25′W, 3 Oct 1985, *D. N. Smith et al. 11641* (F, MO, USM); Huascarán National Park. mouth of Quebrada Ishinca. Warm slopes; mix of shrubby grassland and *Polylepis sericea* woods, 09°23′S 077°29′W, 15 Feb 1985, *D. N. Smith et al. 9597* (F, MO, USM); Shacshicucho, 26 Aug 1978, *J. Mostacero L. et al. 569* (MO); Valley of Río Marcará, 2.5 hr from Vicos on trail to Lejiacocha, 09°19′00″S 077°31′00″W, 11 March 1964, *P. C. Hutchison & J. K. Wright 4325* (F, MO, USM); Sonquenua, Shilla, 21 Dic 1989, *R. Arce & J. Sánchez 188* (MO); Huaraz. Huascarán National Park. Quebrada Shallap. *Polylepis weberbaueri* woods and bouldery slopes with grassy shrubland, 09°30′S 077°24′W, 20 Feb 1985, *D. N. Smith et al. 9709* (F, MO, USM); 28 May 1982, *E. Cerrate 7696* (MO, USM); Comprado en la feria de plantas medicinales de Huaraz, 07 Jul 1988, *E. Cerrate & M. A. Ferreyra 9123* (USM); Quebrada Quillcayhuanca, 30 Oct 1989, *R. Arce & A. Martel 163* (MO); Huari. Huascarán National Park. Quebrada de Yuraccocha, a lateral valley of Quebrada Rurichinchay Shrublands, grassland, and woods; slopes gentle to very steep; soils over rock or morainal material, 09°22′S 077°17′W, 16 Jun 1986, *D. N. Smith et al. 12737* (MO, USM); Huascarán National Park. Quebrada Pachachaca, a lateral valley of Quebrada Rurichinchay. Dense brushfields with some grassy or boggy areas; moderate to steep, E-facing slopes; soils of morainal material, 09°27′S 077°16′W, 12 Jun 1986, *D. N. Smith et al. 12542* (F, MO); Huascarán National Park. southside of Quebrada Carhuazcancha. Wooded ravines; steep, northernly slopes, 09°28′S 077°15′W, 6 May 1986, *D. N. Smith et al. 12255* (MO, USM); Llanganuco, 29 Nov 2007, *B. Lasermann I12* (USM); Acopalca, 09°20′25″S 077°12′19″W, 11 Aug 2010, *Xue-Jun, Ge et al. 194* (USM); Huaylas. Huascarán National Park. terminal moraine at W end of lake Dry, steep, bouldery moraine, 09°00′S 077°41′W, 29 Sep 1985, *D. N. Smith 11537* (MO, USM); Huascarán National Park. Quebrada Parón. Shrublands on bouldery terrain, 09°01′S 077°43′W, 8 May 1985, *D. N. Smith 10606* (MO); Huascarán National Park. Parón valley. Morainal material, very rocky. Between permanent camp and lake, 09°00′S 077°42′W, 1 Jan 1985, *D. N. Smith & K. Goodwin 8924* (AAU, F, MO, USM); Huascarán National Park. Parón Valley. Shrubland, field of large boulders, 09°01′S 077°43′W, 1 Jan 1985, *D. N. Smith & K. Goodwin 8939* (MO, USM); Huascarán National Park. Western flank of Cordillera Blanca, Alpamayo-Cashapampa trail. Ravines with small trees and shrubs, grassland, and shrubby grassland, 08°53′S 077°45′W, 13 Mar 1985, *D. N. Smith & R. Valencia 10013* (MO, USM); Huascarán National Park. Quebrada Santa Cruz at base of and entering Quebrada Artizonraju. Shrubland at lower elevevation, and grassland above, 08°55′S 077°36′W, 16 Jan 1985, *D. N. Smith et al. 9298* (F, MO, USM); Huascarán National Park. Lower slopes of Cerro Pakla Puna grassland; steep to moderately- steep slopes, southern aspects, 08°49′S 077°57′W, 9 Apr 1986, *D. N. Smith et al. 12055* (AAU, F, MO, USM); Yungay. Laguna de Llanganuco, 19 Feb 1968, *A. Gutiérrez R. 249-AGR* (MO), *249* (F); Laguna Llanganuco, 1 Nov1984, *A. Sagástegui A. et al. 12315* (F, MO); Huascarán National Park. Lake Llanganuco. *Polylepis* forest at lake side, 09°05′S 077°39′W, 16 Aug 1984, *D. N. Smith 8210* (MO); Huascarán National Park. Llanganuco sector, Quebrada Deman- da, side valley to Nevado Pisco. Grasslands and Polylepis sericea woods on morainal material; E-facing slopes, 09°02′S 077°37′W, 13 Apr 1985, *D. N. Smith & V. Cautivo 10302* (MO, USM); Huascarán National Park. Quebrada Ranincuray. *Polylepis weberbauerii* forest, including wet bottoms and talus slopes, 09°00′S 077°33′W, 11 Jan 1985, *D. N. Smith et al. 9049* (AAU, F, MO, USM); Huascarán National Park. Morococha at largest lake. Polylepis woods and steep slopes with tussock grassland, 08°55′S 077°35′W, 15 Jan 1985, *D. N. Smith et al. 9215* (AAU, F, MO, USM); Quebrada Llanganuco. Cerca de la laguna y el albergue, 04 Jul 1981, *E. Peréz 062* (USM); Slopes below Laguna de LLanganuco in quebrada de Llanganuco ca. 25 Km above Yungay. Just above and below the lake, 27 Jun 1966, *G. Edwin & J. Schunke V. 3826* (A, F); Ruta Vaqueria-Portachuelo, 05 noviembre 1989, *R. Arce 165* (MO); Huaytajirca, en el distrito de Yanama. Procedencia: Matca (Yanama), 16 Dic 1989, *R. Arce & Abilio 186* (MO); Llanganuco encima de Yungay, 27 Jun 1966, *R. Ferreyra 16860* (MO); Llanganuco arriba de Yungay, 14 Dic 1967, *R. Ferreyra & Blount 18727* (GOET, MO, USM); Llanganuco, arriba de Yungay, 22 Oct 1965, *R. Ferreyra & R. M. Tryon 16503* (MO, USM); near Laguna Llanganuco, 09°03′54″S 077°38′00″W, 14 Aug 2002, *Schmidt-Lebuhn 507* (USM), *510* (USM); 30 km, hacia arriba: Parque Nacional de Huascaran, 10–3-1983, *S. G. Beck 7914* (GOET, MO); Llanganuco P. N. Huascarán, 09°07′00″S 077°37′00″W, 07 Aug 2010, *Xue-Jun et al. 025* (USM). —La Libertad: Sanchez Carrion. señal Huayllides. Grassland dominated by Festuca, "jilca" vegetation, many rock outcrops, NW- facing. Freezing nightime temperatures. Rockiest sites, few grasses, 07°53′S 078°02′W, 21 Aug 1982, *D. N. Smith 2278* (MO, USM).

2. ***Polylepis argentea*** T.Boza & H.R.Quispe sp. nov. Type: Peru. Dpto. Junín: Prov. Concepción, Distrito de Andamarca, a 2.5 km de la localidad de Alhuay, [11°41′30″ S 74°54′01″ W], 4150 m, 10 Oct 2017, *H.R. Quispe M. 85* (holotype: CUZ!; isotype: USM!, Z!).

This species differs from the morphologically closest species *Polylepis sericea* Wedd. in having longer and narrower leaflets, upper leaflet surfaces almost glabrous with some hairs on the midveins, and longer inflorescences.

Trees 4–7 m tall. **Leaves** strongly congested at the branch tips, imparipinnate with 3 pairs of leaflets, obtrullate in

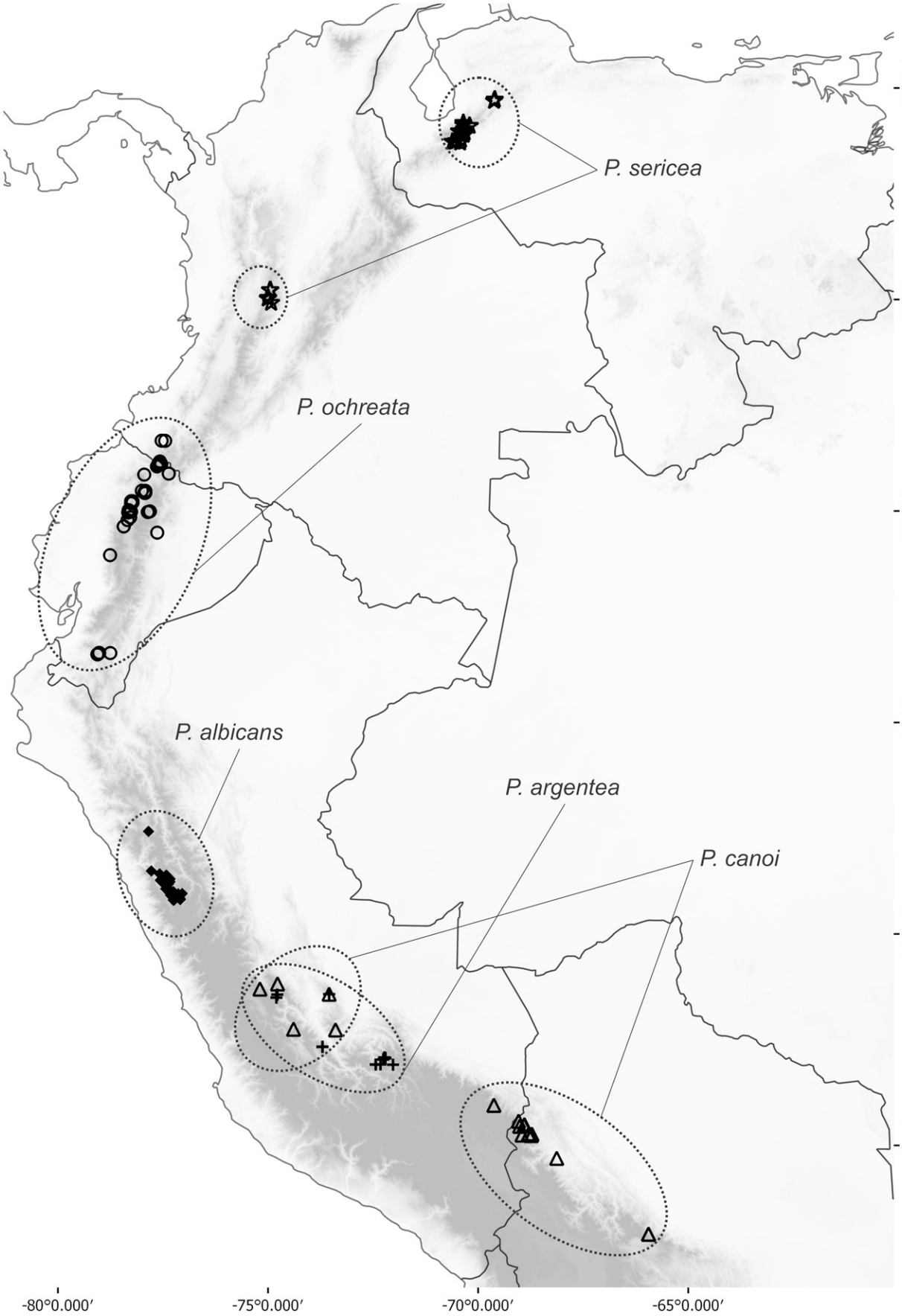

FIG. 2. Map showing the geographical distribution of the species of the *Polylepis sericea* complex.

outline, (2.9)3.3–4.3 × (2.6–)3.3–4.3 cm; rachises densely sericeous, points of leaflet attachment with a tuft of long, straight hairs, sometimes with resin at leaflet insertion; stipular sheaths apically acute with spurs, densely sericeous on the outer surfaces; leaflets narrowly elliptic in outline, second pair from the terminal leaflet the largest, one of this pair (1.9)2.4–2.6 × 0.5–0.7 cm; margin entire, coriaceous, apically acute to slightly retuse, basally unequally cordate; upper leaflet surfaces almost glabrous with some hairs on the midveins to densely sericeous with silky hairs throughout; lower leaflet surfaces densely sericeous with silky hairs 0.6–0.9 mm long. **Inflorescences** pendent, 7.2–8.1 cm long, bearing 5–6(–9) flowers; floral bracts 4.5–5.6 mm long, narrowly triangular, densely sericeous on the outer surface; rachises sericeous. **Flowers** 7–9 mm diam; sepals 3–4, ovate, green, densely sericeous outside; stamens 7–10, anthers orbicular, with a dense tuft of straight white hairs on the upper half; styles fimbriate, 2.7–4 4 mm long. **Fruits** turbinate, with variable numbers and placement of flattened spines, densely sericeous; 2.3–2.5 × 3.5–5.3 mm including spines. Figure 3.

Distribution and Habitat*—Polylepis argentea* has been found in central Peru at La Mar (Ayacucho), Concepcion, Huancayo, and Satipo (Junin), and La Convencion and Urubamba (Cusco). It grows mainly in humid Andean forest at 2000–4340 m elevation. It often co-occurs with *P. pauta*, *P. rodolfo-vasquezii*, and *P. canoi*, and although hybrids are not yet known, these might occur (Fig. 2).

***Etymology*—**The species epithet "*argentea*" (Latin: silvery) refers to the silvery white hairs that have a metallic lustre.

***Conservation Status*—**The estimated extent of occurrence (EOO) for *Polylepis argentea* is 23,787 km^2. The mapped area of suitable habitat produces an estimate of the occupied habitat or Area of Occupancy (AOO) of 40 km^2. This would qualify the species as VU or Vulnerable, according to IUCN (2015) criteria and categories. Boyle (2001) described extensive forest of this species in the remote Cordillera Vilcabamba.

Notes*—Polylepis argentea* seems morphologically closest to *P. sericea* and *P. canoi* with which it shares similar lower leaflet surfaces hairs type and density. The most obvious differences between *P. argentea* and these species is leaflet size, with *P. argentea* having leaflets of 1.9–2.6 × 0.5–0.7 cm, whereas *P. canoi* has leaflets of 2.4–3.9 × 0.8–1.5 cm and *P. sericea* of 1.8–2.1 × 0.8–1.0 cm. Further, *P. argentea* has shorter hairs (0.6–0.9 mm vs.1.3–1.7 mm) than *P. canoi*. In *P. canoi,* the hairs on the lower leaflet surfaces are yellowish and often most pronounced on the secondary veins, whereas in *P. argentea* they are silky and more evenly distributed. *Polylepis argentea* has the upper leaflet surfaces with a few hairs on midveins whereas *P. sericea* has totally glabrous upper leaflet surfaces. Additionally, the inflorescence length and number of flowers per inflorescence differ between the species, with *P. argentea* having inflorescences 7.2–8.1 cm long with 5–9 flowers, compared with values of 3.3–4.5 cm and 9–15 flowers in *P. sericea*, and 8.2–14.5 cm and 12–26 flowers in *P. canoi*. The three species can also be distinguished by the number of stamens and style length, with *P. argentea* having 7–10 stamens and styles 2.7–4.4 mm long, whereas the other two species have 13–15 stamens and styles 2.4–3.8 mm in *P. canoi* and 1.9–2.5 mm in *P. sericea.*

Polylepis argentea was first collected by B. Boyle during scientific expeditions carried out in 1997 and 1998 to the isolated Cordillera Vilcabamba where he recorded three species of *Polylepis* (Boyle 2001). The first one he called *Polylepis* sp1 and described as "a tree of 4–5 m with rather small silvery-tomentose leaflets" (specimen *Boyle 4149*) dominating the fractured forest. A second species of *Polylepis* "with fewer, darker green and nearly glabrous leaflets" called *Polylepis* cf. *sericea* (*Boyle 4151*), occurred patchily within stands of *Polylepis* sp1 as well as in monospecific stands. The third species mentioned was *Polylepis* cf. *pauta* (*Boyle 4398*), described as "a common tall tree (to 25 m high) in the tall hilltop forest." "The slightly different colours of the foliage of each species of *Polylepis* made this gradation obvious even from a distance" (Boyle 2001). Disentangling these three species based on Boyle's specimens we assign them as follows: *Polylepis* sp1 is *P. argentea*, *P.* cf. *sericea* is *P. canoi,* and *P.* cf. *pauta* is indeed *P. pauta*.

***Additional Specimens Examined*—Peru.**—Junín: Concepcion. Andamarca, 14 Jun 2002, *G. Martinez N. 18* (USM); Satipo. Satipo/La Convencion Cordillera Vilcabamba Rio Ene slope, near summit of divide, 11°39′30″S 073°40′02″W, 07 Jun 1997, *B. Boyle et al. 4149* (USM); Huancayo. Distrito de Santo Domingo de Acobamba. A 5 km de la localidad de Callanca. 508608, 8699728, 11°45′43″S 074°55′15″W, 12 Oct 2017, *H. R. Quispe M. 87* (CUZ, USM, Z). —Ayacucho: La Mar. Dist. Tambo. Estera Community, Sector Muyuorco, 12°54′19″S 073°48′17″W, 29 Jun 2015, *T. E. Boza E. et al. 3036* (USM, Z), *3096* (USM, Z), *3097* (USM, Z), *3098* (USM, Z), *3099* (USM, Z), *3100* (USM, Z), *3101* (USM, Z), *3102* (USM, Z), *3103* (USM, Z), *3104* (USM, Z), *3105* (USM, Z), *3106* (USM, Z). —Cusco: La Convención. Dist. Huayopata. Abra Málaga, 13°08′05″S 072°19′18″W, 13 Jun 2015, *T. E. Boza E. & E. Urquiaga 3032* (USM, Z), *3082* (USM, Z), *3083* (USM, Z), *3084* (USM, Z); Dist. Huayopata. Localidad Panticalle, Abra Málaga, [13°08′02″S 072°19′32″W], 30 May 2006, *J. Toivonen M. & L. Puelles 84* (CUZ), *85* (CUZ), *86* (CUZ), *87* (CUZ); Urubamba. Dist. Ollantaytambo, Huaytampo, Bosque primario, 13°10′47″S 072°21′10″W, 07 Nov 2002, *G. Calatayud et al. 1035* (CUZ, F, MO, USM); Santuario Histórico Machu Pichu, camino Inca, Km 88–112, por puente Ruinas, 13°18′S 072°07′W, 20–21 Jun 1988, *P. Núñez V. & A. Pyrke 9204* (MO); Inkatambo, [13°18′06″S 072°31′44″W], Sep 2002, *R. Arce &* J. *Toivonen M. s.n.* (CUZ); Abra Málaga, [13°08′43″S 072°18′09″W], Oct 2002, *R. Arce & J. Toivonen M. s.n.* (CUZ); Qésqa, [13°17′51″S 072°24′57″W], Oct 2002, *R. Arce & J. Toivonen M. s.n.* (USM); Inkatambo, 13°18′06″S 072°31′44″W, Sep 2002, *R. Arce & J. Toivonen M. s.n.* (USM); Distrito Ollantaytambo. Localidad Abra Málaga, [13°09′02″S 072°18′09″W], 29 May 2006, *J. Toivonen M. & L. Puelles 15* (CUZ), *16* (CUZ); Dist. Ollantaytambo. Localidad Huaytampo, [13°10′31″S 072°21′03″W], 06 Jul 2006, *J. Toivonen M. & L. Puelles 95* (CUZ), *96* (CUZ).

3. Polylepis canoi W.Mend. Revista Peru. Biol. 12(1): 104. 2005. Type: Peru. Cusco. La Convención, Cordillera del Vilcabamba, 30 km caminando de la hacienda Luisiana y del Río Apurimac, 3400 m, 17 Jul 1968, *T. R. Dudley 11180* (holotype: MO!; isotypes: NA, F!).

Trees 4–7 m tall. **Leaves** strongly congested at the branch tips, imparipinnate with 3–4(5) pairs of leaflets, obtrullate in outline, (4.0–)7.9–9.4 × (4.2–)6.7–7.5 cm; rachises densely sericeous, points of leaflet attachment with a tuft of long, straight yellowish hairs, with ferruginous resin at leaflet insertion; stipular sheaths apically acute with spurs, glabrous in both surfaces; leaflets obovate in outline, second pair from the terminal leaflet the largest, one of this pair (2.4–)3.4–3.9 × (0.8–)1.1–1.5 cm; margin entire to slightly serrate, coriaceous, apically slightly emarginate, basally unequally cordate; upper leaflet surfaces glabrous or with sparse sericeous hairs; lower leaflet surfaces densely sericeous with yellowish hairs 1.3–1.7 mm. long. **Inflorescences** pendent, 8.2–14.5 cm long, bearing 12–17(26) flowers; floral bracts 7.0–15.8 mm long, narrowly triangular, densely sericeous on the outer surface; rachises sericeous. **Flowers** 7.8–11.2 mm diam; sepals 3–4, ovate, green, densely sericeous outside; stamens 13–15, anthers orbicular, with a dense tuft of straight white hairs on the upper half; styles fimbriate, 2.4–3.8 mm long. **Fruits** turbinate, with variable

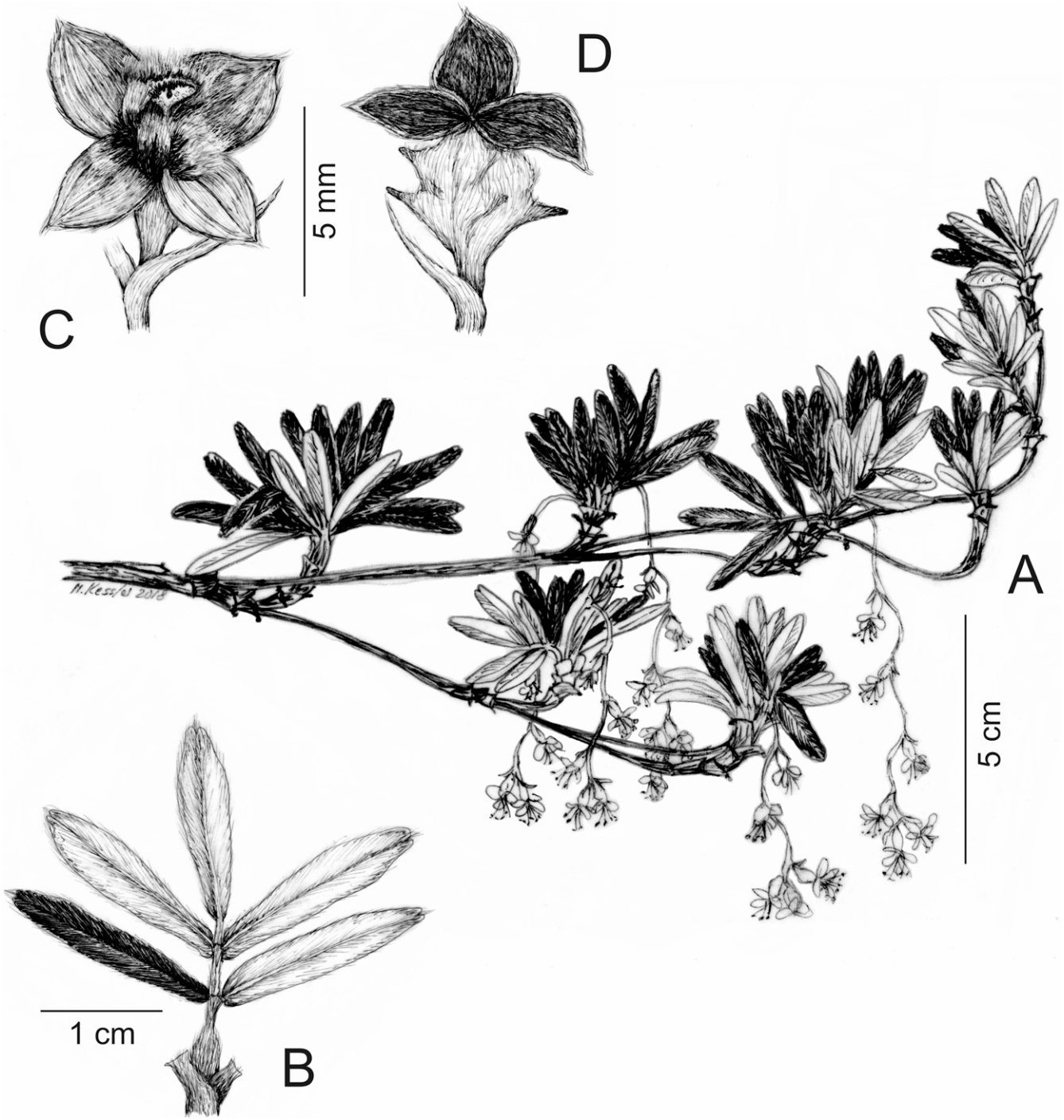

FIG. 3. *Polylepis argentea*. A. Habit. B. Leaf, seen from the underside, with one leaflet turned to show the upper surface. C. Flower. D. Fruit. (Drawn from the isotype by M. Kessler).

numbers and placement of flattened spines, densely sericeous; 5.2 × 7.5 mm including spines.

Distribution and Habitat—*Polylepis canoi* is distributed from the central-southeastern Peruvian Andes to the central Bolivian Andes. The species occurs in wet Andean forest at 3300–4275 m elevation. It co-occurs with *P. argentea* and *P. pauta* in Peru, and with *P. lanata* In Bolivia (Fig. 2).

Conservation Status—The EOO is estimated as 97,613 km^2 and AOO as 68 km^2. The species is known from 14 locations among Peru and Bolivia. *Polylepis canoi* would therefore be assigned a conservation status of Near Threatened (NT). A decline in AOO, extent and quality of habitat, number of locations, and number of individuals would therefore be critical for this species.

Notes—This species was treated as endemic to Peru by Mendoza (2005) when he described the species. Based on the specimens seen by us, we revise its distribution to extend to Bolivia. The specimens from Puno (Peru), and La Paz and Cochabamba (Bolivia), were previously determined as *P. sericea* (e.g. Kessler 1995a). Furthermore, the specimen cited by Schmidt-Lebuhn et al. (2006) as first record of *P. pauta* for Bolivia is here re-identified as *P. canoi.*

Polylepis canoi seems morphologically closest to *P. ochreata* and *P. sericea.* However, it has obovate and larger (2.4–3.9 × 0.8–1.5 cm) leaflets than the other two species, which have elliptic and smaller (1.8–2.7 × 0.5–1.0 cm) leaflets. Additionally, *P. canoi* has longer hairs (1.3–1.7 mm) than the other two species (0.7–1.2 mm).

***Additional Specimens Examined*—Peru.**—Cusco: La Convención. Usually on eastern slopes c. 30 km walking distance NE from Hacienda Luisiana and the Apurimac River, 12°30′S 073°30′W, 19 Jul 1968, *T. R. Dudley 11221* (F, USM).—Junín: Jauja. Distrito Molinos. Comunidad Curimarca, Jucha, 11°33′S 075°18′W, 10 Nov 2016, *F. N. Ames M. & H. R. Quispe M. s.n.* (Z); Satipo. Junin/Cusco Prov. Satipo? La Convencion. Cordillera Vilcabamba. Río Ene, slope near summit of divide, 11°39′S 073°40′W, 07 Jun 1997, *B. Boyle et al.4151* (USM); Distrito de Pampa Hermosa. Comunidad de Toldopampa, Tasta, 11°26′S 074°53′W, 04 Oct 2016, *F. N. Ames M. & H. R. Quispe M. s.n.* (Z). PUNO: Huancasayani, on road to Limbani just east of Abra Aricoma, 14°13′S 069°42′W, 28 Mar 1987, *D. Boertmann 129* (AAU); Huancasayani between Abra Aricoma and Limbani, roadside and cultivated areas near houses, 14°13′S 069°42′W, 28 Mar 1987, *J.S. Brandbyge 511* (AAU).—**Bolivia.**—Cochabamba: Chapare. Mayka Mayu, *I. Hensen 2248* (BOLV, LPB, MO, TEX); Maycamayu, ca. 60 km N Sacaba, 17°12′S 065°58′W, 11 Aug 1991, *M. Kessler*), *2874* (GOET), *2875* (GOET), *2877* (GOET), *2878* (AAU), *2879* (GOET, MO), *2880* (GOET). —La Paz: Bautista Saavedra, Area Natural de Manejo Integrado Apolobamba, bajada de Waricunca, más allá de Chaka, por el antiguo camino Sorapata-Apolo, 14°53′19″S 068°47′04″W, 28 Mar 2009, *A. F. Fuentes & H. Huaylla 13589* (BOLV, LPB, MA, MO, USZ); Area Natural de Manejo Integrado Apolobamba, sector Chaka, bosque continuo al SE del campamento cerca de la cueva, por el antiguo camino Laji Sorapata-Apolo, 14°53′32″S 068°47′12″W, 30 Mar 2009, *A. F. Fuentes & H. Huaylla 13634* (LPB, MO, QCA, USZ), *13639* (BOLV, LPB, MO, QCA, USZ); Área Natural de Manejo Integrado Apolobamba. Bajada de Wuaricunca, más allá de Chaka, por el antiguo camino Hilo-Hilo - Apolo, 14°53′11″S 068°47′04″W, 06 Apr 2009, *A. F. Fuentes & S. Achá 13897* (BOLV, LPB, MA, MO, QCA, USZ); Chaka Machay(Laji), 14°53′S 068°47′W, 14 Sep 2002, *F. Zenteno 1507* (LPB); Área Natural de Manejo Integrado Apolobamba, Hilo Hilo, Juchuy Queñua a medio día de Laji Sorapata., 14°54′52″S 068°48′08″W, 16 Apr 2009, *I. Loza et al. 757* (LPB, MO), *775* (BOLV, LPB, MA, MO, USZ), *788* (LPB, MO, QCA, USZ); Area Natural de Manejo Integrado Madidi, Hilo Hilo. Sobre el río Tumamayu en la localidad de Laji Sorapata, 14°53′14″S 068°51′52″W, 10 Apr 2009, *I. Loza et al. 635A* (LPB, MA, MO), *645* (LPB, MO, QCA, USZ); Franz Tamayo. Bosque de Queñuari, 14°54′31″S 069°01′07″W, 28 Sep 2006, *A. Palabral et al. 489* (LPB); Área Natural de Manejo Integrado Apolobamba, Keara bajo, 14°42′09″S 069°04′35″W, 21 Nov 2007, *A. Araujo M. & F. Canqui 4078* (LPB, MO); Parque Nacional Madidi, Puina Viejo, ca. 3 km rio abajo por camino al W del rio. Matorrales y pajonales de sustitución del bosque de ceja de monte inferior pluvial, 14°34′58″S 069°06′24″W, 21 Jun 2005, *A. F. Fuentes et al. 8549* (LPB, MO); Parque Nacional Madidi, entre Queara y Mojos, sector Mosquito, pajonales secundarios del bosque de yungas en ceja de monte inferior pluvial, en partes manchas de bosques, área muy húmeda en partes con suelos encharcados, 14°39′37″S 068°57′54″W, 26 Feb 2008, *A. F. Fuentes & J. Quisbert 12028* (BOLV, LPB, MO, QCA, USZ); Parque Nacional Madidi, Hilo Hilo, arriba de la mina Kanupata en la localidad de Laji Sorapata, 14°52′28″S 068°51′15″W, 11 Apr 2009, *I. Loza, A. T. Fernández C et al. 671* (BOLV, HSB, LPB, MA, MO, NY, QCA, USZ); Área Natural de Manejo Integrado Apolobamba, Hilo Hilo, Chaka, sobre la senda hacia Amantala, 14°53′16″S 068°47′16″W, 16 Aug 2009, *L. Cayola et al. 3417* (BOLV, LPB, MA, MO, USZ); Senda Pelechuco-Mojo, sector Tambo Quemado, a media hora del campamento siguiendo senda Pelechuco Moxos, 14°41′03″S 068°58′22″W, 01 May 2003, *N. Paniagua Z. et al. 5710* (LPB, MA, MO); Larecaja. Bosque de la localidad de Hirola, pasando Lipichi, 15°26′41″S 068°10′57″W, 05 Nov 2008, *A. Palabral et al. 705* (LPB); Murillo. 8 km after Palca on the road to Iquico, 10 Nov. 1967, *B. S. Vuilleumier 342* (MO).

4. Polylepis ochreata (Wedd.) Bitter, Bot. Jahrb. Syst. 45: 598. 1911. *Acaena ochreata* Wedd., Chlor. And. 2: 240. 1855. Type: Ecuador. Prov. Pichincha, W slopes of Cerro Pichincha, 3600 m, May 1856, *Jameson 73* (lectotype, designated by Simpson (1979, p. 28): P; isolectotypes: A!, G!, GH!, US!; photographs in F!, MO!, US!).

Polylepis ochreata var. *integra* Bitter, Bot. Jahrb. Syst. 45: 598, fig. 4. 1911. Type: Ecuador. Prov. Imbabura, Volcán Mojanda, Mar. 1901, *Sodiro s.n.* (holotype: FI not seen; isotype: GOET!).

Polylepis stuebelii Hieron., Bot. Jahrb. Syst. 21: 313. 1896. Type: Ecuador. Prov. Napo, E slope of Cerro Quilindaña near Bambasacha, 3700 m, *Stübel 204* (holotype: B destroyed, photograph in F!, MO!, NY!, US!).

Polylepis subintegra Benoist, Bull. Soc. Bot. France 81: 326. 1934. Type: Ecuador. Prov. Pichincha, W slopes of Cerro Pichincha, Taurichupa, 4000 m, 28 Nov 1930 *Benoist 3356* (Holotype: P!).

Trees 4–7 m tall. **Leaves** strongly congested at the branch tips, imparipinnate with 5–8 pairs of leaflets, obtrullate in outline, 4.3–7.0 × 3.4–4.0 cm; rachises sparsely sericeous, points of leaflet attachment with a tuft of long, straight whitish hairs; stipular sheaths apically acute with spurs, glabrous to sparsely sericeous in the upper surface; leaflets narrowly elliptic in outline, second pair from the terminal leaflet the largest, one of this pair 1.8–2.7 × 0.5–0.7 cm; margin crenate or slightly crenate, coriaceous, apically emarginate, basally unequally cordate; upper leaflet surfaces glabrous or sparsely sericeous with hairs on the midveins; lower leaflet surfaces sparsely sericeous with whitish hairs 0.9–1.2 mm long, most conspicuous on the veins. **Inflorescences** pendent, 5.8–20.0 cm long, bearing (16–)21–50 flowers; floral bracts 7.6–8.1 mm long, narrowly triangular, densely sericeous on the outer surface; rachises sericeous. **Flowers** 4.7–8.3 mm diam; sepals 4, ovate, green, densely sericeous outside; stamens 9–15, anthers orbicular, with a dense tuft of straight white hairs on the upper half; styles fimbriate, 1.9–2.5 mm long. **Fruits** turbinate, with variable numbers and placement of flattened spines, densely sericeous; 1.7–4.1 × 1.8–5.0 mm, including spines.

Distribution and Habitat*—Polylepis ochreata* is distributed in the Andes of Ecuador in Nariño, and southernmost Colombia. It occurs at 2500–4030 m elevation in humid montane forest habitats. It often co-occurs with *P. pauta*, with which it hybridizes extensively (Romoleroux 1996). Locally, these two species also overlap with *P. incana,* and then triple hybrids have been found (Fig. 2).

Conservation Status*—Polylepis ochreata* is preliminarily assessed as LC or NT, based on an area of occupancy (AOO) estimated at 140 km^2 and an extent of occurrence (EOO) of 39,588 km^2 with 24 known locations.

***Notes*—**We argue that this taxon should be reinstated at species level based on its distinctive morphology characters, including having 5 or more leaflet pairs, glabrous to sparsely sericeous leaf rachises and leaflet margins, and 21–50 flowers per inflorescence. *Polylepis ochreata* is most similar to *P. albicans* and *P. argentea*, with which it shares the elliptic leaflet shape, emarginate apices, and subcordate bases of the leaflets. However, the three species differ in number of leaflet pairs, with *P. ochreata* having 5–8 pairs, *P. albicans* 4–5, and *P. argentea* 3. *Polylepis ochreata* has (16)21–50 flowers per inflorescence, whereas *P. albicans* has 18–21, and *P. argentea* 5–6(–9).

***Additional Specimens Examined*—Colombia.**—Nariño: Cumbal, Volcán Nevado Cumbal, N- NE slopes (from the Vereda "Las Vuertas"), 05 Mar 1999–09 Mar 1999, *D. Stancík 2752* (COL); Vereda Quilizmal, Laguna de Cumbal, 02 Nov 2008, *R. Cortés & B. Devia 2550* (COL). **Ecuador.**—Azuay: *W. Jameson s.n.* (MO); Along drinkwater-canal on W-side of Atacazo, c. 5 km S of Campamento, 00°20′S 078°38′W, 24 Oct 1984, *S. Lægaard 53256* (AAU); Bolívar: Guaranda. Parroquia Salinas. Recorrido entre los Arrayanes y Pambabuela. Bosque secundario. Bosque Húmedo Montano, 01°22′06″S 079°03′47″W, 10 Feb 2005, *H. Vargas L et al.4696* (AAU, K, MO,

QCNE, US).—CARCHI: Km 31 west of Tulcán on road to Maldonado, 00°52′N 077°55′W, 21 Jun 1984, *C. A. Todzia & J. W. Grimes 2485* (MO); *E. Asplund 17037* (S); Cantón Montúfar. Loma El Corazón (Bretaña), al sureste de Huaca, al este de la Colonia Huaqueña. Río Minas. Bosque muy húmedo Montano. Bosque primario; suelos volcánicos, 00°35′N 077°42′W, 9 Apr 1989, *G. A. Tipaz 35* (AAU, MO); Carretera Tulcán - Tufiño - Maldonado, 12 Oct 1986, *K. Romoleroux 189* (AAU, QCA); a 33 km de Tulcán, *K. Romoleroux 173* (AAU, QCA); Southern slopes of Volcan Chiles, 00°49′S 077°57′W, 21 Oct 1987, *P. M. Ramsay & P. J. Merrow-Smith 911* (QCNE); *R. Bensman 418* (MO, WIS); Road Tulcan - Maldonado, near Volcán Chiles. *Polylepis* forest and paramo, 00°48′N 077°56′W, 16 Aug 1985, *S. Lægaard 54967D* (AAU, QCA), *54967E* (AAU, QCA), *54967F* (AAU, QCA); Volc. Los Chiles, along road 9 km W of Tufiño. *Espeletia* páramo with a small remain of mountain forest, 00°49′N 077°57′W, 10 Mar 1992, *S. Lægaard 101661* (AAU, GOET, QCA); Road Tulcán - Maldonado, near Volcán Chiles. *Polylepis* forest and paramo, 00°48′N 077°56′W, 16 Aug 1985, *S. Lægaard 54966* (AAU, MO, QCA); S slopes of volcan Chiles, 14–16 km W of Tufiño on road to Maldonado; 0–1 km S of the road, 00°47′N 077°57′W, 18 Jan 1988, *U. Molau et al. 2536* (AAU, GB, MO, QCA); Tulcán, 33.4 km W of Tulcán on road to Maldonado, Páramo de Chiles on Colombia border, 00°48′19″N 077°53′03″W, 22 Sep 1979, *A. H. Gentry & E. Schupp 26342* (AAU, MO, QCA); Camino Tufiño, Sitio Agua Hediondas, en la base del Volcán Chiles, límite con Colombia. Bosque muy húmedo montano. Bosque secundario. Suelos volcánicos. 00°48′N 077°54′W, 08 Nov 1993, *W. A. Palacios 11847* (AAU, MO, QCNE); Carretera entre Tulcán y Maldonado, Faldas del Volcán Chiles; punto más alto del cruce de carretera. Bosque de páramo, 00°45′N 077°59′W, 19 May 1991, *W. A. Palacios & D. Rubio 7349* (AAU, MO). COTOPAXI: Quebrada Faldiguera. Hcda. El Pongo. cuadrat. 50x10 m, 00°41′S 078°45′W, 16 Feb 1991, *P. M. Jørgensen et al. 93000* (AAU, MO, QCA).—IMBABURA: W slopes of Volcán Cayambe, 27 Jul 1967, *B. Sparre 17789* (AAU, S); Laguna Mojanda, camino, forêt d'altitude, 00°08′N 078°15′W, 1 feb 1996, *F. Billiet & B. Jadin 6762* (BR, MO); Road from Otovalo to Laguna Mojanda, collections made along road, 00°10′N 078°20′W - 00°15′N 078°20′W, 22 May 1989, *J. F. Smith 1992* (MO); Laguna Mojanda, at the southern part of Laguna Negra, forested slopes near the lake, 00°08′N 078°15′W, 29 Jun 1983, *J. S. Brandbyge 42200* (AAU, MO, NY, QCA); *K. Romoleroux 339* (QCA); Vía hacia la laguna de Mojanda, 02 Nov 1987, *K. Romoleroux et al. 475* (AAU, QCA); At road Chauasqui - Merced de Buenos Aires, km 20, near pass, 00°33′N 078°17′W, 10 Dec 1984, *S. Lægaard 53475* (AAU, MO, QCA); Otavalo, Forested path to Laguna Mojanda (La vía antiguo a Mojanda por el cementario), Paramo, 00°10′00″N 078°15′00″W, 31 Dec 00, *J.L. Clark 5820* (QCA, US).—LOJA: Paramo of Fierro Urcu SW of Saraguro, 03°43′S 079°19′W, 21 Nov 1996, *B. Øllgaard, G.P. Lewis, P. Lozano & B. Merino 2121* (AAU); Road Loja-Saraguro, 8.5 km N of San Lucas, track to Fierro Urco, km 11, vegetation: tussock grass paramo on 30–40 cm deep black humid soil, with *Polylepis* forest in small declivity, 15 Jan 1998, *G. P. Lewis & C. E. Hughes 3804* (AAU, MO); Road Loja-Cuenca, km 50, track to Fierro Urco, km 11, vegetation: Grass paramo with pockets of bosque andino, 03°41′S 079°17′W, 25 Oct. 1996, *G. P. Lewis & P. Lozano 2724* (AAU, MO); Road Loja-Saraguro, km 52, track to fierro Urco, km 10. Vegetation: *Polylepis* forest in small declivity of tussock-grass paramo, 03°42′S 079°18′W, 17 Jan 1997, *G.P. Lewis et al. 2932* (AAU, MO); Paramo of Fierro Urcu SW of Saraguro, 03°43′S 079°19′W, 21 Nov 1996, *G. P. Lewis et al. 2121* (AAU); *J. L. Jaramillo 7332* (QCA); *7335* (GB, QCA); Cerro Chinchilla "Parroquia Celén", 19 Sep 1984, *J. L. Jaramillo 7312* (AAU, GB, MO, NY, QCA); Road San Lucas-Saraguro km 9, turn off to Fierro Urcu, 11 km to the pass, disturbed, previously burnt grass páramo, with patchy Andean forest below. Dry season, 03°43′03″S 079°19′25″W, 4 Nov 2000, *P.M. Jørgensen et al. 2228*; Fierro Urco, Saraguro-Loja, Km 12.4 turnoff towards Fierro Urco, Km 23.8, páramo frequently burned, 03°43′10″S 079°19′18″W, 06 Dec 1994, *P.M. Jørgensen et al. 1240* (AAU, MO); Fierro Urco, grass paramo 12 km to the left (northbound) from the Panamerican highway, 03°43′S 079°19′W, 09 Jun 1999, *P. Sklenár & S. Lægaard 7096* (AAU); Ca 10 km along road to Fierro Urco, in and near a small forest remain with *Polylepis sericea*, 03°41′S 079°01′W, 9 Aug 1998, S. Lægaard 19109 (AAU); Ca km 12 along paramo road to Fierro Urco, 03°43′S 079°19′W, 6 Sep 1999, *S. Lægaard & P. Sklenár 20279* (AAU).—NAPO: Road Quito-Baeza, 7–8 km NW of Laguna de Papallacta (Páramo de Guamaní). Flat boggy depression, adjacent bunch grass páramo and *Polylepis*-forest, 00°19′S 078°08′W, 20 Jul 1976, *B. Øllgaard & H. Balslev 8156* (AAU, MO, NY); Paso de Guamaní, quebrada, about +-4 km E Paso de Guamaní, on road to Papallacta, 26 Mar 1967, *B. Sparre 15029* (AAU, S); Paramo de Papallacta, exact locality unknown, 12 Jan 2015, *M. Kessler s.n.* (Z); 3 km E of Paso de la Virgen on road Pifo - Papallacta, 00°20′S 078°11′W, 02 Jun 1985, *S. Lægaard 54448* (AAU, MO, QCA); N-side of Volcán Pichincha above Hacienda Yanacocha, *Polylepis* forest, 00°07′S 078°34′W, 02 Jun 1985, *S. Lægaard 54457* (AAU, MO, QCA). PICHINCHA: Volcán Pichincha, N slopes, road to Hda. Yanacocha from pass on Quito-Nono road, km 7–11.2, rocky banks in scrub forest, 00°07′S 078°33′W, 10 Dec 1991, *B. Øllgaard 99187* (AAU); Reserva Yanacocha, Trocha "Inca" 1–600m, 00°06′44″S 078°34′24″W, 11 Jun 2011, *C. Ulloa et al. 2171* (MO, QCA); *E. Asplund 17103* (S); NW side of Pichincha, *F. Fagerlind & P. Wibom s.n. (S)*; Camino Yanacocha NW of Volcan Pichincha, Montane cloud forest, 00°05′S 078°33′W, 10 Mar 1981, *H. Balslev et al. 2049* (AAU, MO, NY, QCA); *I. Holmgren 664* (S); Yanococha, faldas noroccidentales, 22 Mar 1987, *J. L. Jaramillo 9573* (AAU, NY, QCA); *9588* (AAU, QCA); SW-slopes of Volcán Atacazo, Remnants of forest and open parts with tussuck grasses and shrubs, 00°20′S 078°35′W, 28 Oct 1984, *J. S. Brandbyge 42837* (AAU, MO, QCA); SW-slopes of Volcán Atacazo, Remnants of forest, mainly *Polylepis*, *Oreopanax*, *Escallonia*, *Gynoxys*, 00°20′S 078°35′W, 11 Oct 1984, *J. S. Brandbyge 42817* (AAU, MO, QCA); 03 Nov 1987, K. *Romoleroux* 476 (AAU, QCA); *243* (QCA); *305* (QCA); *245* (NY, QCA); Carretera a San Juan - Atacazo, km 1–12, 00°20′S 078°35′W, 02 Sep 1990, *K. Romoleroux 1060* (AAU, QCA); *350* (QCA); *K. Romoleroux & A. Freire 1495* (AAU, QCA); Carretera Quito-Nanegalito-Santa Ana del Tablón, desvío Had. Yanacocha km 1–10 desde el desvio, 00°07′S 078°34′W, 06 Dec 1992, *K. Romoleroux & A. Freire 1495A* (AAU); Laguna Grande de Mojanda, 00°08′N 078°16′W, 30 Jun 1988, *K. Romoleroux & S. Lægaard 657* (AAU, QCA), *658* (AAU, QCA); Yanacocha. Sector La Despensa. Trasecta de 40 × 20, 00°07′52″S 078°35′06″W, 14 Feb 2009, *K. Romoleroux et al. 5413* (MO, QCA); Corazón, 00°31′53″S 078°39′36″W, *L. Sodiro s.n.* (AAU); Northern slopes of Cerro Corazón, 2–4 km W of along on the road to Hacienda El Pongo, Montane scrub along road, 00°28′S 078°36′W, 13 May 1979, *L. B. Holm-Nielsen 18007* (AAU, MO); Volcán Atacazo, W slope, 17 km from San Juan. *Polylepis* forest, 00°20′S 078°38′W, 25 Aug 1980, *L.B. Holm-Nielsen & E. Asanza C. 25115* (AAU), *25148* (AAU), *25169* (AAU); Volcán Atacazo, *Luis A. Mille 364* (US); *R. Benoist 4549* (S); West-side of Volcán Atacazo, along drinkwater-canal, 00°20′S 078°38′W, 11 Aug 1984, *S. Lægaard 52639* (AAU, MO, QCA); Páramo de Mojanda, at Laguna Negra and S-side of Laguna Grande, 00°08′N 078°16′W, 14 May 1985, *S. Lægaard 54316A* (AAU, QCA); N-side of Volcán Pichincha above Hacienda Yanacocha, *Polylepis* forest, 00°07′S 078°34′W, 04 Jun 1985, *S. Lægaard 54459* (AAU), *54467* (AAU, MO), *54476* (AAU, MO, QCA); Along drinkwater-canal on W-side of Atacazo, c. 5 km S of Campamento, 00°20′S 078°38′W, 28 Oct 1984, *S. Lægaard 53259* (AAU), *53260* (AAU); Páramo de Mojanda. at Laguna Negra and S-side of Laguna Grande, 00°08′N 078°16′W, 14 May 1985, *S. Lægaard 54331* (AAU, MO, QCA), *54338* (AAU, MO, QCA), *54343* (AAU, MO, QCA); Along drinkwater-canal on W-side of Volcán Atacazo, 00°20′S 078°38′W, 24 Nov 1985, *S. Lægaard 55665* (AAU, GOET, MO, QCA); At highest pass on road Mojanda-Tabacundo, 00°07′N 078°15′W, 4 Aug 2001, *S. Lægaard et al. 21538B* (AAU); about 500 m S of (above) Laguna Grande de Mojanda, 00°08′N 078°16′W, 30 Dec 1987, *U. Molau & B. Eriksen 2294* (AAU, GB, QCA); carretera Quito-San Juan-San José de la Victoria, en la cercanía de San José en vegetación de borde de carretero, 00°17′53″S 078°38′20″W, 24 Dec 1987, *V. Zak & J. L. Jaramillo 3265* (AAU, GB, MO); carretera Quito-Nono-Tandayapa, desviación a Yanacocha en la localidad de Guanto-pugro, en la hacienda "Alto Perú", en restos de vegetación andina, estribaciones N.O. del Volcán Pichincha, 00°05′S 078°35′W, 17 Nov 1987, *V. Zak & J. L. Jaramillo 2946* (AAU, GB, MO).—TABACUNDO: Lagunas Mojanda, manchas de vegetación arbórea en páramo, suelos de origen volcánico, 00°07′N 078°16′W, 30 Jul 1992–31 Jul 1992, *W. A. Palacios et al. 10210* (AAU, MO), *10239* (AAU, MO).

5. POLYLEPIS SERICEA Wedd., Chlor. And. 2: 238. 1857. TYPE: VENEZUELA. Mérida, Sierra Nevada, 3500 m, Jun 1847, *Funck & Schlim 1546* (lectotype, designated by Simpson (1979, p. 28): P!; isolectotypes: G!, photograph in F!).

Polylepis hypargyrea Bitter, Bot. Jahrb. Syst. 45: 600. 1911. TYPE: VENEZUELA. Paramo de la Culata, Sierra Nevada *Moritz 1120* (holotype: B destroyed; isotype: BM!, photograph in F!, GH!).

Polylepis quindiensis Cuatrecasas, Revista Acad. Colomb. Ci. Exact. 4: 343 0.1941. TYPE: COLOMBIA. Caldas, Cordillera Central, W of Macizo del Quindio, Nevado del Ruiz, 3400–3500, 5 May 1940, *Cuatrecasas 9327* (holotype: COL!; isotypes: BC!, US!).

Trees 3–7 m tall. **Leaves** strongly congested at the branch tips, imparipinnate with 3–4 pairs of leaflets, obtrullate in outline, 3.9–4.2 × 2.5–3.8 cm; rachises glabrous, points of leaflet attachment with a tuft of long, straight whitish hairs; stipular sheaths apically acute with spurs, almost glabrous with some hairs at the edges on the outer surfaces and glabrous

in the inner surfaces; leaflets elliptic in outline, second pair from the terminal leaflet the largest, one of this pair 1.8–2.1 × 0.8–1.0 cm; margin entire, coriaceous, apically emarginate to retuse, basally unequally cordate; upper leaflet surfaces glabrous; lower leaflet surfaces densely sericeous with whitish hairs 0.7–1.0 mm. long. **Inflorescences** pendent, 3.3–4.5 cm long, bearing 9–15 flowers; floral bracts 4.1–6.4 mm long, narrowly triangular, densely sericeous on the outer surface; rachises sericeous. **Flowers** 4.2–8.1 mm diam; sepals 4, ovate, green, densely sericeous outside; stamens 13–15, anthers orbicular, with a dense tuft of straight white hairs on the upper half; styles fimbriate, 1.9–2.5 mm long. **Fruits** turbinate, with variable numbers and placement of flattened spines, densely sericeous; 4.0–7.4 × 3.4–9.6 mm, including spines.

Distribution and Habitat*—Polylepis sericea* is found in two distinct geographic areas, the Cordillera de Mérida in the Andes of western Venezuela and the Cordillera Central of Colombia in Caldas, Quindio, and Risaralda departments. It grows at 3300–4200 m in humid montane forest, where it is the only species of the genus (Fig. 2).

***Conservation Status*—**The estimated Extent of Occurrence (EOO) for *Polylepis sericea* is 20,856 km^2. The Area of occupancy (AOO) is 84 km^2. This would likely qualify the species as NT.

***Notes*—**This species can be distinguished from *P. ochreata* by the number of leaflet pairs (3–4 vs. 5–8), leaflet margin (entire vs. crenate), leaflet hair density (glabrous above and densely sericeous beneath in *P. sericea* vs. glabrous to sparsely sericeous above and sparsely sericeous beneath in *P. ochreata*), inflorescence length (3.3–4.5 cm vs. 5.8–20.0 cm), and flower number (9–15 vs. 21–50).

***Additional Specimens Examined*—Colombia.**—Caldas: Cordillera Central, vertiente occidental, vert. sudoeste del Ruiz, El Prisco, páramos, 04°58′N 075°22′W, 05 May 1940, *J. Cuatrecasas 9327* (COL); Cordillera central, vertiente occidental; cabeceras del río Otún, Laguna del Mosquito y plan del Villar, 26 Nov 1946, *J. Cuatrecasas 23257* (COL); El Cisne, Laguna del Otúm, 20 Mar 2009, *W. G. Vargas 20063* (COL).—Quindío: Salento, Vereda Cocóra, below Nevado del Quindio [Andean forest between 3300–3400 m; subpáramo and *Polylepis*-forest between 3500–3900 m; páramo starting about 3700 m to 3950 m], 04°40′N 075°20′W-04°45′N 075°25′W, 20 May 1989–22 May 1989, *J. L. Luteyn et al. 12974* (MO).—Risaralda: Pereira. Cordillera central, en el paso de la Laguna del Otúm hacia la Quebrada Africa, 09 Feb1980, *J. M. Jaramillo D. et al. 6276* (COL). **Venezuela.**—Lara: Páramo del Jabón, Vertiente Oriental, 3100–3400 m, 2 Nov 1969, *Cuatrecasas et al.* 28216 (MERF).—Mérida: Caserio Mifafi, camino quebrada de rio Chama-Caserio Mucumpis a través del páramo Piedra Blanca (entrada por la carretera Apartaderous-Pico Aguila), 14 Aug 1980, *B. Stergios 2116* (MO); Páramo seco y húmedo en el sector de Sto, Domingo de Mucubají los alrededores de la Laguna de Mucubají, 29 May 1986, *B. Stergios 8378* (MO); Distr. Rangel. Sierra Nevada de Santo Domingo, road between Laguna de Mucubaji and Laguna Negra. Woodsample Uw: U 24380, 7 Mar 1979, E. G. B. Kieft 87 (MO); Carretera hacia Piñango, páramo Piedras Blancas, Dtto. Rangel, 03 Mar 1982, *G. Aymard et al.1050* (MO); Sierra Nevada, 27 Jul 1934, *H. Farenholtz 1927* (GOET); *1833* (GOET); Pico Bolivar, 17 Jan 1968, *H. U. E. Walter 443* (GOET); 25 Nov 1959, *H. G. Barclay 9816* (MO); 3 Dec 1959, *H. G. Barclay 9951* (MO); Sierra Nevada, Páramo alrededores de La Laguna Verde próximo Picos Humboldt y Bonpland, 4 Dec 1959, *H. G. Barclay & P. Juajibioy C. 10034* (COL, MO); Paramos de Laguna Grande, 21 Jan 1929, *H. Pittier 13253* (MO); Distrito Rangel, cascada SE of Laguna de Mucubaji and below Pico Mucuñuque, páramo and *Polylepis* Woods, Parque Nacional Sierra Nevada, 08°48′N 070°49′W, 15 Jun 1988, *L. J. Dorr & L. C. Barnett 5524* (MO); Margenes del rio Chama, cerca de Apartadevos, Jul 1971, *L. Aristeguieta 7886* (MO); La Nevada, Hauteur: 11,000, 1817, *L. J. Schlim 1546* (MO); E. Moraine at the head of the valley above L. Mucubají, on a small rocky cliff just above and east of the lowest falls, 21 Jul 1972, *L. Loveless 1722* (MO); Distrito Justo Briceño, páramo y chirivital en la vertiente NW del Alto del Totumo, hoya del Río Chirurí, a 19.5 km de El Aguila por la carretera a Piñango, groves of trees at base of rocky cliff with large boulders, 2 Apr 1982, *P. E. Berry 3812* (MO); Distrito Justo Briceño, páramo y chirivital en la vertiente NW del Alto del Totumo, hoya del Río Chirurí, a 19.5 km de El Aguila por la carretera a Piñango, 29 Apr 1982–1 May 1982, *P. E. Berry & J. A. Gomez 3844* (MO); Quebrada Yoyo, 12 Apr 1930, *W. Gehriger 73* (MO); Andes de Merida/Steilhang oberhalb Laguna Negra, Aug 1958, *W. Schwabe s.n.* (GOET); Andes de Merida, Jan 1973, *W. Schwabe s.n.* (GOET); Berghange oberhalb Laguna Negra/Paramo, *W. Schwabe s.n.* (GOET); Libertador, Parque Nacional Sierra Nevada, Loma Redonda Teleférico station and south, 08°33′N 071°05′W, 20 May 1988, *L. J. Dorr & L. C. Barnett 5220* (AAU).—Trujillo: Mun. Carache, P.N. Dinira, arriba de Mesa Arriba, debajo del Pico Cendé, ladera SO, 09°32′N 070°07′W, 1 Apr 1999, R. Duno et al. 767 (MO, VEN).

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Author Contributions

This work is part of the Ph.D. thesis research of T. E. Boza E. and was developed under the supervision of Dr. Kessler. Both authors contributed to any taxonomic decision adopted in this paper. The fieldwork was done by T. E. Boza E. and H. R. Quispe M. All authors provided comments on taxonomic treatments and drafts of this manuscript.

Literature Cited

Bitter, G. 1911. Revision der Gattung *Polylepis*. *Botanische Jahrbücher für Systematik* 45: 564–656.

Boyle, B. 2001. Vegetation of two sites in the northern Cordillera de Vilcabamba, Peru. Pp. 69–79 in *Biological and Social Assessments on the Cordillera de Vilcabamba, Peru*, eds. L. E. Alonso, A. Alonso, T. S. Schulenberg, and F. Dallmeir. Rap Working Papers, 12. Washington, DC: Conservation International.

Dauby, G. 2018. ConR: Computation of parameters used in preliminary assessment of conservation status. R package version 1.2.2. https://CRAN.R-project.org/package=ConR.

Davis, P. H. and V. H. Heywood. 1973. *Principles of Angiosperm Taxonomy*. Huntington, New York: R. E. Krieger.

De Queiroz, K. 1998. The general lineage concept of species, species criteria, and the process of speciation: A conceptual unification and terminological recommendations. Pp. 57–75 in *Endless Forms: Species and Speciation*, eds. D. J. Howard and S. H. Berlocher. New York: Oxford University Press.

Hensen, I. 2002. Impacts of anthropogenic activity on the vegetation of *Polylepis* woodlands in the region of Cochabamba, Bolivia. *Ecotropica (Bonn)* 8: 183–203.

Hickey, M. and C. King. 2000. *The Cambridge Illustrated Glossary of Botanical Terms*. Cambridge, UK: Cambridge University Press.

Hoch, G. and C. Körner. 2005. Growth, demography and carbon relations of *Polylepis* trees at the world's highest treeline. *Functional Ecology* 19: 941–951.

IUCN. 2015. Guidelines for the application of IUCN Red List of ecosystems categories and criteria, version 1.0, eds. L. M. Bland, D. A. Keith, N. J. Murray, and J. P. Rodríguez. Gland, Switzerland: IUCN.

Karger, D. N., O. Conrad, J. Böhner, T. Kawohl, H. Kreft, R. W. Soria-Auza, N. E. Zimmermann, H. P. Linder, and M. Kessler. 2017. Climatologies at high resolution for the earth's land surface areas. *Scientific Data* 4: 170122.

Kessler, M. 1995a. Polylepis-Wälder Boliviens: Taxa, Ökologie, Verbreitung und Geschichte. Dissertationes Botanicae 246 in Dissertationes Botanicae. Band 246. Stuttgart: J. Cramer.

Kessler, M. 1995b. The genus *Polylepis* (Rosaceae) in Bolivia. *Candollea* 42: 31–71.

Kessler, M. and A. N. Schmidt-Lebuhn. 2006. Taxonomical and distributional notes on *Polylepis* (Rosaceae). *Organisms, Diversity & Evolution* 6: 67–70.

Kessler, M., A. Kühn, V. G. Solis N, and I. Hensen. 2014. Complex geographical distribution of ploidy levels in *Polylepis australis* (Rosaceae), an endemic tree line species in Argentina. *International Journal of Plant Sciences* 175: 955–961.

Mendoza, W. 2005. New species of *Polylepis* (Rosaceae) from Vilcabamba mountain range (Cusco, Peru). *Revista Peruana de Biología* 12: 103–106.

Mendoza, W. and A. Cano. 2012. *El género* Polylepis *en el Perú: Taxonomía, Morfología y Distribución*. Saarbrücken: Editorial Académica Española.

Pilger, R. K. F. 1906. Rosaceae andinae. *Botanische Jahrbucher für Systematik, Pflanzengeschichte und Pflanzengeographie* 37: 534–539.

Romoleroux, K. 1996. Rosaceae 79. *Flora of Ecuador*. Stockholm: Publishing House of the Swedish Research Council.

Segovia-Salcedo, M. C., A. Domic, T. E. Boza, and M. Kessler. 2018. Situación taxonómica de las especies del género *Polylepis*. Implicancias para los estudios ecológicos, la conservación y la restauración de sus bosques. *Ecología Austral* 28: 188–201.

Schmidt-Lebuhn, A. N., M. Kessler, and M. Kumar. 2006. Promiscuity in the Andes: Species relationships in *Polylepis* (Rosaceae, Sanguisorbeae) based on AFLP and morphology. *Systematic Botany* 31: 547–559.

Schmidt-Lebuhn, A. N., J. Fuchs, D. Hertel, H. Hirsch, J. Toivonen, and M. Kessler. 2010. An Andean radiation: Polyploidy in the tree genus *Polylepis* (Rosaceae, Sanguisorbeae). *Plant Biology* 12: 917–926.

Simpson, B. B. 1979. A revision of the genus *Polylepis* (Rosaceae: Sanguisorbeae). *Smithsonian Contributions to Botany* 43: 1–62.

Sylvester, S. P., F. Heitkamp, M. D. P. V. Sylvester, H. F. Jungkunst, H. J. M. Sipman, J. M. Toivonen, C. A. Gonzales I, J. C. Ospina, and M. Kessler. 2017. Relict high-Andean ecosystems challenge our concepts of naturalness and human impact. *Scientific Reports* 7: 3334.

Stearn, W. T. 2004. *Botanical Latin*. Portland, Oregon: Timber Press.

Weddell, H. A. 1857. VII *Polylepis*. *Chloris Andina* 2: 237–249.