



Polylepis pacensis M. Kessler & Schmidt-Leb.

Polylepis racemosa Ruiz & Pav.

Polylepis tomentella Wedd.

ROSACEAE

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Synonyms

***Polylepis racemosa* Ruiz & Pav.:** *Polylepis incana* subsp. *icosandra* Bitter; *Polylepis incana* subsp. *micranthera* Bitter; *Polylepis incana* var. *connectens* Bitter; *Polylepis incana* var. *primovestita* Bitter; *Polylepis villosa* Kunth

***Polylepis tomentella* Wedd.:** *Polylepis tarapacana* Phil.; *Polylepis tomentella* subsp. *dentatialata* Bitter; *Polylepis tomentella* subsp. *pentaphylla* Bitter; *Polylepis tomentella* var. *tetragona* Bitter; *Polylepis tomentella* subsp. *pilosior* Bitter

Local Names

***Polylepis pacensis*: Bolivia:** Keñua (Spanish), Queñua (Aymara) (Bussmann et al. 2016)

***Polylepis racemosa*: Peru:** Quinual (Spanish)

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***Polylepis tomentella*: Bolivia:** Keñua (Spanish) (Bussmann et al. 2016); **Chile:** Keñoa, Keñua

Botany and Ecology

***Polylepis pacensis*:** Evergreen tree up to 8 m tall; bark of trunk and larger branches reddish brown, thick, flaking off in small pieces. Leaves mostly congested at tips of branches, imparipinnate with 2–3 pairs of leaflets, obtusate in outline, 2.5–4.0 cm wide and (2.0–)3.0–4.5 cm long; rachises densely to weakly pinnose; stipular sheaths weakly spurred at apex, incised beyond middle, densely villous. Leaflets obovate in outline, the apical pair larger, one of this pair 0.5–1.0(–1.2) cm wide and 1.5–2.0 cm long; margins crenate in apical half, conspicuously revolute; apices emarginate (to rounded); bases acute; terminal leaflets with 1–4-mm-long petiolule; upper surfaces sparsely pilose and balding, dark green; lower surfaces white to grayish from an evenly distributed, densely pinnose indumentum, with additional yellowish glandular hairs especially on the central veins; inflorescences pendant, unbranched, (4–)6–9(–10) cm long, bearing 6–10 flowers; floral bracts 4–7 mm long, brown; inflorescence rachises moderately to densely pinnose. Flowers perfect, 0.6–1.0 cm in diameter; sepals 3–4, obovate to almost rounded, yellowish to reddish, outer surfaces pinnose especially near tips, inner surfaces pilose near tips; stamens about 24, anthers with curly white trichomes along whole length but more densely in upper half, style base glabrous. Fruits turbinate with 3–4 irregular, flattened ridges with 1–4 teeth each, body of fruit densely pinnose, 0.4–0.5 cm wide including protuberances, 0.7–0.8 cm long (Macbride and Weberbauer 1936–1995) (Figs. 1, 2, 3, 4, 5, and 6).

***Polylepis racemosa*:** Trees 4–15 m tall. Leaves congested at the ends of the branches, imparipinnate with 1–3 pairs of leaflets; rhomboid to obtusate in outline, 2.3–5.0 cm wide and 3.5–8.8 cm long, rachises villous, especially along a line on the upper surface near the base of the leaf and extending into the inside of the stipule sheath; point of leaflet attachment with a tuft of long white, straight trichomes; stipular sheaths with a slight shoulder or sloping away from the petiole, glabrous on the outer surface but with long trichomes protruding at the apex from the inside surface. Leaflets obovate to almost oblong in outline, second pair from the terminal leaflet the largest when present, a leaflet of this pair from 0.6–0.7 cm wide and 2.1–3.7 cm long, margins crenate, especially at the apex, apex slightly to deeply emarginate, base attenuate, or unequal; upper leaflet surface glabrous, dark green, sometimes with scattered trichomes in the midvein depression; lower surface with long, shaggy trichomes inserted on the veins but loosely covering the entire under-surface, these trichomes mixed with a variable number of short, twisted, several-celled, often glandular trichomes. Inflorescences pendant, 4.0–11 cm long, bearing 3–11 flowers; floral bracts lanceolate, to 3 mm long, scarious; rachises with scattered, curled trichomes. Flowers perfect, 0.9–1.0 cm in diameter, sepals 4, ovate, outer surface villous especially at the tips, pilose on the tips of the inner surface, often with intermixed several-celled glandular trichomes, stamens 10–20.



Fig. 1 *Polylepis multijuga* (Rosaceae), El Jardin, Leymebamba, Peru. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)

Anthers orbicular, barbate; style often enlarged near the base due to projection of the ovary from the floral cup, villous at the point of projection. Fruit turbinate with 4–5 irregular, flattened wings projecting into a point at the top, body of the fruit covered with curled, white trichomes mixed with glandular multicellular trichomes, 0.2–0.9 cm wide including wings, 0.3–0.8 cm long (Macbride and Weberbauer 1936–1995) (Figs. 7, 8, 9, 10, 11, and 12).

***Polylepis tomentella*:** Small trees 1–4 m tall. Leaves congested at the ends of the branches or continuously borne all along the branches, composed of 1, occasionally 2 pairs of leaflets, trullate in outline, 0.8–3.9 cm wide, 1.9–2.4 cm long, rachises glabrous or covered on the abaxial side with glandular trichomes and long, white, single-celled trichomes, point of leaflet attachment sericeous; stipule sheaths with a slight shoulder at the apex or sloping downward, glabrous at the bottom of the outer surface, the top of the outer surface often with glandular trichomes, and with long trichomes projecting from the inside upper sheath surface. Leaflets ovate to obovate, 0.3–0.6 cm wide and 0.7–2.0 cm long, variable in thickness, margins entire to crenate, apex obtuse, base unequal; upper surface glabrous, dull green or yellowish green; lower surface variable, densely pilose, often with glandular multicellular trichomes giving the surface a matted, yellow appearance or glabrescent with scattered glandular protuberances. Inflorescences upright or pendant; if upright, bearing 1–2 flowers, if pendant, with 1–8 flowers, 0.1–5.1 cm long; floral bracts



Fig. 2 *Polylepis multijuga* (Rosaceae), El Jardin, Leymebamba, Peru. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)

Fig. 3 *Polylepis multijuga* (Rosaceae), El Jardin, Leymebamba, Peru. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



hidden or lanceolate, denticulate, about 2 mm long, sparsely covered with glandular trichomes; rachises glabrescent with appressed, twisted trichomes mixed with glandular protuberances and resin. Flowers perfect, 0.4–0.6 cm in diameter, sepals 3, ovate, sometimes adnate at the base, green, outer surface with twisted white trichomes and glandular protuberances, stamens 6–14, ovoid, red, tomentose at the apex; base of style hispid. Fruit turbinate, with 3–4 ridges, the ridges sometimes

Fig. 4 *Polylepis multijuga* (Rosaceae), El Jardin, Leymebamba, Peru. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



Fig. 5 *Polylepis multijuga* (Rosaceae), El Jardin, Leymebamba, Peru. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



Fig. 6 *Polylepis multijuga* (Rosaceae), El Jardin, Leymebamba, Peru. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



expanded into wings with entire or toothed margins or merely with a few knobs, body of the fruit with twisted trichomes, 0.2–0.78 cm wide, including ridges, 0.3–0.9 cm long (Macbride and Weberbauer 1936–1995) (Figs. 13, 14, and 15).

Fig. 7 *Polylepis racemosa* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



Fig. 8 *Polylepis racemosa* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



Local Medicinal Uses

***Polylepis pacensis*: Bolivia:** Branches and leaves are used to treat stomachache and prostate problems (Bussmann et al. 2016).

***Polylepis racemosa*: Peru:** Leaves, fresh or dried, are used to treat bloating and as, after birth, detoxifier (Bussmann and Sharon 2006, 2007, 2015a, b). The species has



Fig. 9 *Polylepis racemosa* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



Fig. 10 *Polylepis reticulata* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)

Fig. 11 *Polylepis reticulata* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



strong antibacterial activities (Bussmann et al. 2010a, 2011a, b). It is sometimes sold in local medicinal plant markets (Bussmann et al. 2007) and can be an ingredient in herbal mixtures (Bussmann et al. 2010b).

***Polylepis tomentella*:** The bark is taken in **Colombia** as tea and is a remedy for the lungs. The infusion is a remedy for the heart, cough, and bad urine. Boiled with burnt sugar, it is a remedy for bronchial infections (González and Molina 2017; Rodríguez et al. 2018; Villagrán and Castro 2003). **Bolivia:** Branches and leaves are used to treat stomachache and fever (Bussmann et al. 2016).

Local Handicraft and Other Uses

All species are used as firewood.

***Polylepis racemosa*:** **Peru:** Used for bad air (mal aire) (Bussmann and Sharon 2006, 2007, 2015a, b; Bussmann et al. 2010c). It is rarely found in local markets (Bussmann et al. 2007).

***Polylepis tomentella*:** The wood is used for the construction of roofs and also as firewood. Different handicrafts are carved with the root. Carbon was made with the trunk (González and Molina 2017; Rodríguez et al. 2018; Villagrán and Castro 2003).

Fig. 12 *Polylepis reticulata*
(Rosaceae), La Paz, Bolivia.
(Photo R.W. Bussmann and
N.Y. Paniagua-Zambrana)



Fig. 13 *Polylepis tomentella*
(Rosaceae), La Paz, Bolivia.
(Photo R.W. Bussmann and
N.Y. Paniagua-Zambrana)



Fig. 14 *Polylepis tomentella* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



Fig. 15 *Polylepis tomentella* (Rosaceae), La Paz, Bolivia. (Photo R.W. Bussmann and N.Y. Paniagua-Zambrana)



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