

**EUDEMA** Humboldt & Bonpland, Pl. Aequinoct. 2: 133. 1813.  
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Tribe:

Name derivation: for Eudemus of Rhodes (ca. 370–300 BC.) an ancient Greek philosopher, a student of Aristotle, and the first historian of science.

Lectotype species (designated by Al-Shehbaz, 1990: 100): *E. rupestris* Humboldt & Bonpland.

**Herbs**, perennial, scapose, with rhizomes or caudex, basally with petiolar remains of previous years. **Trichomes** simple or dendritic, rarely absent. **Multicellular glands** absent. **Stems** absent. **Basal leaves** petiolate, fleshy or not, rosulate, simple, entire or rarely pinnately lobed or dentate; cauline leaves absent. **Inflorescences** solitary flowers on long pedicels originating from axils of rosette leaves, maturing centripetally; fruiting pedicels ascending to divaricate or recurved, persistent. **Sepals** ovate or oblong, free, deciduous, erect, equal, base of inner pair not saccate. **Petals** white, creamy white, or yellow, erect at base with flaring blade, longer than sepals; blade obovate, spatulate, oblanceolate, or sublinear, apex obtuse or rounded; claw not differentiated from blade. **Stamens** 6, slightly or exserted, erect, slightly tetradynamous; filaments filiform, wingless, unappendaged, not dilated at base, glabrous; anthers ovate or oblong, rounded at base, not apiculate at apex. **Nectar glands** 4, distinct; median nectaries absent; lateral nectaries 1 on each side of lateral stamens. **Ovules** 2–60 per ovary; placentation parietal. **Fruit** dehiscent, capsular silicles, oblong, ovate, obovate, ovoid, pyriform, orbicular, or subglobose, terete, or slightly to strongly flattened and latiseptate or angustiseptate, unsegmented; valves papery, veinless, glabrous, keeled or not keeled and flat or rounded, smooth, wingless, unappendaged; gynophore absent; replum rounded; septum complete or reduced to a rim, membranous, not veined; style obsolete or distinct and to 3 mm, filiform, glabrous, persistent; stigma capitate, entire, unappendaged. **Seeds** biseriate, wingless, oblong to ovoid, plump or slightly flattened; seed coat coarsely reticulate, not mucilaginous when wetted; cotyledons incumbent, entire. Six species: South America (Argentina, Bolivia, Chile, Ecuador, Peru). Reference: Al-Shehbaz (1990a).

KEY TO THE SPECIES OF *EUDEMA*

1. Leaf trichomes dendritic; plants rhizomatous.
  2. Leaves entire, adaxially densely pubescent, rarely glabrescent or only ciliate; sepals free ..... 6. *E. werdermannii*
  2. Leaves pinnately lobed or rarely coarsely toothed, adaxially sparsely pubescent; sepals connate ..... 1. *E. friesii*
1. Leaf trichomes simple or absent; plants with a caudex, if rhizomatous then leaves glabrous and fruit flattened.
  3. Plants rhizomatous; fruit obovate to pyriform, strongly latiseptate ..... 2. *E. hauthalii*
  3. Plants with caudex; fruit ovoid or oblong, terete to slightly latiseptate.
    4. Fruit ovoid; petiole base thick, not flattened; leaf blade spatulate, ovate, or oblanceolate; seeds 1–5 on each placenta ..... 4. *E. nubigena*
    4. Fruit oblong; petiole base flattened; leaf blade linear to narrowly oblanceolate; seeds 10–30 on each placenta.
      5. Leaf blade ciliate; septum complete; fruit strongly incurved; seeds plump, 30–60 per fruit, 0.7–0.8 mm; style 0.4–0.7 mm ..... 3. *E. incurva*
      5. Leaf blade not ciliate; septum reduced to a rim; fruit straight; seeds flattened, 20–26 per fruit, 1.2–1.7 mm; style (2.5–)3–3.5 mm ..... 5. *E. rupestris*

**1. *Eudema friesii*** O. E. Schulz, Pflanzenreich IV. 105(Heft 86): 245. 1924. TYPE: Argentina, Prov. Salta, Incachuli bei San Antonio de las Cobras, ca. 5000 m, 30 Oct 1901, *Fries 703* (holotype, B!, fragments BAA!; isotype, UPS!, US!).

Plants rhizomatous, prostrate; rhizome branches slender, with a sessile scale at each node, terminated by rosettes and covered below leaves with petiolar remains of previous years. Leaves rosulate, petiolate; petiole shorter than blade; leaf blade lanceolate to linear, (5–)9–16 mm, (1.5–)2–3 mm wide, abaxially glabrous, adaxially and margin sparsely pubescent with dendritic trichomes, margin pinnately lobed or rarely dentate, apex obtuse or rounded. Sepals connate and calyx 2.5–3.5 mm; lobes ovate, 1–1.5 mm, erect, glabrous or subapically sparsely pubescent with dendritic trichomes, margin scarious; petals creamy white or yellow, spatulate, 5–6.5 mm, 1.2–1.5 mm wide, attenuate to clawlike base, apex rounded; filaments erect, slender, 3–3.5 mm; anthers oblong, 0.9–1 mm. Young fruiting pedicels 2–4 mm. Immature fruit sessile, ovate, latiseptate; valves glabrous; septum reduced to a narrow rim, hyaline; style ca. 0.5 mm. Seeds not seen.

Flowering: Dec–Jan.

Habitat: puno

Altitude: 2850–5000 m.

Distribution: Bolivia (Oruro), Chile (Región I, II), S Peru.

Specimens examined: **BOLIVIA. Oruro:** Prov. Carangas, Sajama, *Asplund 3988* (A, S).

**CHILE.** Chungará, [18°14'S, 69°10'W], 21 Jan 1971, Zöllner s.n. (CONC); Tarapacá, camino de Putre a Chucuyo, km 15, Marticorena et al. 201 (CONC). Chungará, 24 Jan 1971, Zöllner s.n.

(SI). **I:** Iquique, Collaguasi, Qda La Represa, 20°59'S, 68°38'W, Teillier 3017 (CONC); Iquique, Ujina, 20°58'S, 68°37'W, *Pisano 1725* (CONC, SGO); Lagunas del Huasco, 20°18'S, 68°53'W, Sielfed 80 (CONC). **II:** Vegas del Río Zapaleri, 22°57'S, 67°13'W, Moreira 258 (CONC, SGO); El Loa, Cerro Nevados de Poquis, 23°4'S, 67°4'W, Arroyo et al. 97357 (CONC). **PERU.** San Antonio de Esquilache, *Stafford 703* (BM, K).

The distribution of *Eudema friesii* covers parts of Argentina, Bolivia, and Peru, but the species appears to be very rare, as evidenced from the single collections from each of these countries. The species is herein reported for the first time from Peru.

**2. *Eudema hauthalii*** Gilg & Muschler, Bot. Jahrb. Syst. 42: 471. 1909; *Brayopsis hauthalii* (Gilg & Muschler) Skottsberg, Kongl. Svensk. Vetenskapsakad. Handl. 56(5): 236. 1916.

TYPE: Argentina, Prov. Santa Cruz, Río Gallegos, Cerro Buitres, 1899, *R. Hauthal 10618* (holotype, B!, fragments BAA!; isotype, CORD!).

*Brayopsis skottsbergeri* Gilg in Skottsberg, Kongl. Svensk. Vetenskapsakad. Handl. 56(5): 236. 1916. TYPE: Patagonia, Sierra de los Baguales, 5 Feb 1909, *Skottsberg s.n.* (holotype, UPS!).

Plants glabrous throughout, prostrate, with slender, branched rhizomes, the rhizomal branch terminated by a rosette with petiolar remains of previous years. Leaves rosulate, petiolate; petioles persistent, as long as or longer than blade, strongly flattened at base; leaf blade oblanceolate-spatulate to narrowly oblanceolate or linear, (6–)9–15(–22) mm, (0.7–)1–1.5(–2) mm wide, base attenuate, margin entire, apex rounded. Sepals ovate, 2.5–3.5 mm, (1.2–)1.5–2 mm wide, erect; petals creamy white, oblanceolate, (4.5–)5.5–6.5 mm, (1.2–)1.5–1.8 mm wide, apex rounded; filaments erect, slender, 2.5–3.5 mm; anthers 0.5–0.6 mm. Fruiting pedicels (3–)5–10 mm. Fruit obovate to pyriform, rarely ovate, (4–)5–11(–12) mm, 4–7 mm wide,

latiseptate, dehiscing from apex downward; valves thin, obscurely veined; septum reduced to a narrow rim, hyaline; style slender, 0.5–1 mm. Seeds 4–10 per fruit, light brown, oblong, 2–2.5(–3) mm, 1–1.3(–1.8) mm wide; funicles thick.

Flowering and fruiting:

Habitat: fine gravel, shaley soil by streamside, moist seepage areas.

Altitude: 350–4000 m.

Distribution: Argentina (La Rioja, San Juan, Santa Cruz), Chile (Región XII).

Specimens examined: **ARGENTINA. La Rioja:** Dep Sarmiento, Coraillera de los Andes, Krapovickas & Hunziker 5696 (BAA, LP). **Santa Cruz:** Depto. Lago Argentino, Ea. Pérez, Río de las Vueltas, Meseta Quemada, *Sleumer 1386* (BAA, GH, LIL, US); Sierra Buenos Aires, Lago Argentinna, *James 685* (BM); Cerro Corona, La Victorina, Lago Paine, *Pisano & Pisano 5603* (GH, HIP); Güer Aike, Ea. Las Visachas, Ensenada de Riques, *TBPA 2679* (BAA, HIP); Co sin Nombre, 50°46'S, 72°8'W, *TBPA 2674* (HIP, SI); Co. Pto. La Piedra, *TBPA 2542* (HIP, SI); Lago Frio, 72–73°30'W, 49°50'–51°S, *James 870* (BM); Laguna viscacas, 50°43'S, 71°58'W, *TBPA 2600* (BAB, SI). **San Juan:** Depto. Iglesia, Reserva de San Guillermo Río Macho, Muerto, 7 km from refugio, Nicora et al. 8508 (LP, P); Valle del Cura, Múlgura & Deginani 169 (SI). **CHILE. XII:** Depto. Ultima Esperanza, Sierra de los, Baguales, E. La Cumbre, Co. Sin Nombre, 50°41'S, 72°23'W, *TBPA 757* (CONC, HIP, SI); Cerro Argentino, *Zöllner 8133* (CONC, SI); Valle Baguales, 31 Dec. 1896, *Nordenskjold s.n.* (UPS); Parq Nac. Torres del Paine, Cerro Agudo, 50°49'S, 73°3'W, Arroyo & Squeo 870015 (CONC); Cerro Diente, 50°47'S, 72°57'W, Arroyo & Squeo 850953 (CONC); Cerro Daudet, 50°47'S, 73°5'W, Arroyo 870141 (CONC); Cerro Donoso, Sector Río de las Chinas, 50°44'S, 72°31'W, Arroyo et al. 870226 (CONC); Sierra del Toro, 51°10'S, 72°50'W, Arroyo et al. 92293 (CONC).

**3. *Eudema incurva*** Al-Shehbaz, J. Arnold Arbor. 71: 101. 1990. TYPE: Peru, Depto. Ancash, Prov. Huaraz, Punta Callán and above, summit area of the Huaraz-Casma road, 30 km from Huaraz, 1–3 km N of road, heavily grazed puna with rock outcrops, 77°37'W, 9°32'S, 4200–4400 m, 7 Apr 1988, *U. Molau & B. Eriksen 3512* (holotype, GB!).

Plants with a slender, simple or few branched caudex covered with petiolar remains of previous years. Leaves basal, rosulate, petiolate; petioles persistent, not ciliate, flattened at base, 2–7 mm; leaf blade linear to linear-lanceolate, 5–15 mm, 0.6–1.4 mm wide, ciliate with simple straight trichomes to 2 mm. Sepals oblong, ca. 2.5 mm, pubescent; petals not seen; filaments ca. 2 mm; anthers oblong, ca. 0.8 mm. Fruiting pedicels glabrous, 4–10 mm. Fruit oblong, strongly incurved, 4–8 mm, 2.5–3.5 mm wide, strongly angustiseptate, rounded at base and apex; valves thick, glabrous; septum complete, hyaline; style 0.4–0.7 mm. Seeds 30–60 per fruit, dark brown, broadly ovoid, plump, 0.7–0.8 mm, 0.5–0.6 mm wide, conspicuously reticulate, biseriate; funicles 0.2–0.5 mm.

Flowering: Apr.

Habitat: puna.

Elevation: 4200–4400 m.

Distribution: Peru.

Note: known only from the type collection.

**4. *Eudema nubigena*** Humboldt & Bonpland, Pl. Aequinoct. 2: 136. 1813.

Plants densely caespitose, cushion forming, with a stout, woody, much-branched caudex covered with petiolar remains of previous years. Leaves basal, densely rosulate, petiolate, numerous, somewhat fleshy, glabrous or ciliate with simple trichomes to 1.2 mm; petioles persistent, thick, (2–)3–10 mm; leaf blade spatulate to ovate or oblanceolate, (3–)4–8(–9) mm, 1.5–4(–5) mm wide, margin entire, apex obtuse to subacute. Sepals ovate to oblong, (2–)2.5–3.5(–6) mm, (1.2–)1.5–2 mm wide, erect, margin scarious; petals white to creamy white, broadly obovate, 3–5 mm, 1.5–2.5(–2.8) mm wide, not clawed; filaments erect, slender, 2–3(–3.5) mm; anthers usually violet, oblong, 0.7–1 mm. Fruiting pedicels glabrous, 2–5(–10) mm. Fruit broadly to narrowly ovoid, (2–)3–5(–6) mm, 2–3 mm wide, subterete, rounded at base and apex; valves glabrous, obscurely veined; septum reduced to a narrow rim; style slender, 0.4–2.5(–3) mm. Seeds (2–)4–8(–10) per fruit, dark brown, oblong-ovoid, (1.4–)1.6–2 mm, (0.8–)1–1.3(–1.4) mm wide, conspicuously reticulate; funicles thick, to 0.6 mm.

Two subspecies: Ecuador

KEY TO THE SUBSPECIES OF *EUDEMA NUBIGENA*

1. Leaf blade conspicuously ciliate; fruit mostly narrowly ovoid; style 0.4–1.5(–3) mm .....  
.....4a. subsp. *nubigena*
1. Leaf blade not ciliate; fruit narrowly to broadly ovoid; style (1.2–)1.5–3 mm .....  
.....4b. subsp. *remyana*

**4a. *Eudema nubigena* subsp. *nubigena*; *Draba nubigena* (Humboldt & Bonpland) Desvaux, J. Bot. (Desvaux) 3: 171. 1815; *Sisymbrium nubigenum* (Humboldt & Bonpland) Weddell, Ann. Sci. Nat. Bot. 5(1): 290. 1864; *Hesperis nubigena* (Humboldt & Bonpland) Kuntze, Rev. Gen. Pl. 2: 935. 1891; *Eutrema bonplandii* Sprengel, Syst. Veg. 2: 880. 1825. TYPE: Ecuador, between Quito and Cuenca, Montaña del Assuay, *Humboldt & Bonpland s.n.* (holotype, P!). *Valeriana pygmaea* Turczaninow, Bull. Soc. Imp. Nat. Moscow 25(3): 172. 1852, not Graebner, Bot. Jahrb. Syst. 37: 446. 1906. TYPE Ecuador, from Antisana near the snow limit, *Jameson 751* (holotype, KW; isotype, K!).**

Leaf blade ciliate throughout with trichomes to 1.2 mm. Fruit broadly or rarely narrowly ovoid; style stout, rarely slender, 0.4–1.5(–3) mm.

Elevation: 4100–4700 m.

Habitat: sandy or gravelly superparamo

Distribution: Ecuador (Chimobrazo, Cotopaxi, Imbabura, Pichincha).

Specimens examined: ECUADOR. **Prov. Imbabura:** volcano Cotacachi, *Boysen Larsen et al. 45635* (AAU), *Sklenar 8209* (PRC); Imbabura, *Hirsch 155* (GH); Cayambe Mt., *Cazalet & Pennington 5735* (UC). **Prov. Pichincha:** Cerro Anitsana, *Grubb, Lloyd, Pennington, & Whitmore 632* (K, NY); Pichincha and Antisana, *Sodiño 52* (B); Loma Pilongo, NE slope of Nevado Iliniza, 0°38'S, 78°43'W, *Molau & Eriksen 2269* (GB, QCA); Cerro Iliniza, near border to Cotopaxi, *Harling 11175* (GB); Volcán Iliniza, NE slope, 0°38'S, 78°42'W, *Holm-Nielsen, Ollgaard & Sperling 25009* (AAU, MO, NY), *Holm-Nielsen, Ollgaard & Sperling 24886* (AAU, K, NY); Volcán Iliniza, *Sparre 17457* (S); W Rucu Pichincha, Padre Encantado, 78°36'W, 0°11'S, *Molau et al. 2407* (GB), *Molau et al. 2408* (AAU, GB, QCA); Rucu Pichincha, *Asplund 17310* (NY, S), 1°10'S, 78°34'W, *Sklenar & Kostechova 209* (AAU, MO); upper slopes of Padre Encantado, 78°34'W, 0°07'S, *Molau & Eriksen 3283* (AAU, GB, QCA); Mt. Corazón, *Asplund 17499* (G, K, NY, S); summit of Cerro Pichincha, *Holmgren & Heilborn 175* (S); Mt. Pichincha, near Quito, *Hitchcock 21064* (GH, NY, US); Volcán de Pichincha, *Bell 362* (BM), *Mexia 7652*

(F, GH, MO, UC, US); Andes above Quito, *Jameson 11* (LE), *Jameson 33* (G, GH, P), *Jameson 145* (K), *Jameson 752* (BM, G, LE); W slope of Volcán Chimborazo, 01°30'S, 77°50'W, *Ramsay & Merrow-Smith 978* (K); on Chimborazo and Pichincha, Sept. 1824, *Jameson s.n.* (E); SE Volcán Guagua-Pichincha, 0°10'S, 78°35'W, *Nowak & Marcillo 67* (QCA); Mejia Cantón, E border of Parque Nacional Cotopaxi, Hacienda el Tambo, 0°43'S, 78°23'W, *Clark & Thurber 1933* (MO), Cumbre del Volcán Guagua Pichincha, 0°10'S, 78°35'W, *Nowak 115* (QCA). **Prov. Chimborazo:** Riobamba Cantón, Parque Nacional Sangay, Volcán El Altar, 1°10'S, 78°34'W, *Clark 3575* (MO, QCNE). **Prov. Cotopaxi:** Zumbahua-Puijilí, km 33, 0°53'S, 78°48'W, *Laegaard 102112* (AAU); Angamarca rd, km 5 from jct. To Latacunga-Maná rd., 1°0'S, 78°55'W, *Laegaard 102144* (AAU); Parque Nac. de Cotopaxi, NW of Limpio Pungu to foot of Volcán Rumiñahui, 8°38'S, 78°28'W, *Laegaard 101455* (MO).

**4a. *Eudema nubigena* subsp. *remyana*** (Weddell) Al-Shehbaz, J. Arnold Arbor. 71: 105. 1990; *Sisymbrium remyanum* Weddell, Ann. Sci. Nat. Bot. 5(1): 290. 1864; *Hesperis remyana* (Weddell) Kuntze, Rev. Gen. Pl. 2: 935. 1891; *Brayopsis remyana* (Weddell) Gilg & Muschler, Bot. Jahrb. Syst. 42: 482. 1909; *Eudema remyana* (Weddell) O. E. Schulz, Pflanzenreich IV. 105(Heft 86): 244. 1924. TYPE: Ecuador, Chimborazo, 3 Nov 1856, *Remy s.n.* (holotype, P!, fragments BAA!; photo and fragment, F!).

*Aschersoniodoxa chimborazensis* Gilg & Muschler, Bot. Jahrb. Syst. 42: 470. 1909. TYPE: Ecuador, Chimborazo, 1853, *Hall s.n.* (holotype, B!).

Leaf blades glabrous throughout. Fruit narrowly ovoid or rarely broadly so; style slender or rarely stout, (1.2–)1.5–3 mm.

Flowering: Nov.

Altitude: 3800–5040 m

Habitat: sandy superparamo, scree slopes, open rocks.

Distribution: Ecuador (Bolívar, Chimborazo, Pichincha, Tungurahua).

Habitat: sandy superparamo, scree slopes, open rocks.

Specimens examined: ECUADOR: **Prov. Bolívar:** W base of Volcán Chimborazo, *Maguire & Maguire 61746* (MO, NY, US); ca. 33 km N of Guaranda, W of Volcán Chimborazo, 1°30'S, 78°56'W, *Luteyn 13399* (MO, NY, QCA, US), *Luteyn & Cotton 11076* (GH, NY, QCA, US); 28–29 km NE of Guaranda on Guaranda-Ambato hwy., *Dorr & Valdespino 6488* (GH, NY); Páramo de Chimborazo, Ambato-Guaranda road, km 59, 1°25'S, 78°53'W, *Holm-Nielsen 20875* (MO, NY), same general area, 1°26'S, 78°56'W, *Laegaard 54812* (AAU); W side of Volcan Chimborazo, ca. 4 km from Ambato-Guaranda road, 1°28'S, 78°48'W, *Sklenar & Kosteckova 127-2* (MO, QCA); km 4 on road Los Arenales-Salinas, 1°24'S, 78°55'W, *Laegaard 55354* (AAU); km 6 on Salinas-Los Arenales road, 1°22'S, 79°1'W, *Laegaard 55335* (AAU). **Prov. Chimborazo:** E slope of Mt. Chimborazo, *Asplund 7934* (S); S slope of Mt. Chimborazo, *Asplund 8384* (A, B, CAS, K, NY, P, S, US), *Asplund 8392* (S); WSW slope of Mt. Chimborazo, below Whympfer refuge, 1°28'S, 78°50'W, *Molau & Eriksen 2991* (AAU, GB, QCA), *Laegaard 102813* (AAU); Volcan Chimborazo, 1°28'S, 78°46'W, *Sklenar & Sklenarova 2284* (MO); Chimborazo, *Hirsch E330* (GH), *Whympfer B-197* (QCA); slope of Mt. Chimborazo, above Tortorillas, *Penland & Summers 702* (GH); between Urbina & Mt. Chimborazo, *Hitchcock 21976* (CONC, GH, NY, US); Riobamba, *Primbach 219* (US); Arenal du Chimborazo, *Huttel 372* (QCA). **Prov. Pichincha:** W slope of Volcán Chimborazo, 1°30'S, 77°50'W, *Ramsay &*

*Merrow-Smith 978* (QCA); **Prov. Tungurahua:** Las Minas, SE of Volcán Carihuayrazo, *Brandbyge 42383* (AAU); Tungurahua volcano, 78°23'W, 01°29'S, *Ramsay & Merrow-Smith 274* (K), *Korning & Thomsen 47335* (AAU, QCA); N side of Volcán Tungurahua, 1°27'S, 78°27'W, *Sklenar & Sklenarova 3245* (MO); paramo of Minza, *Penland & Summers 387* (GH, US); Mocha, ca. 2 km NW of Mt. Carihuairazo, 1°24'S, 78°47'W, *Clark 724* (MO, QCNE); El Arenal NW of Chimborazo, 0°25'S, 78°54'W, *Laegaard 51268* (AAU, QCA); Volcán Tungurahua, refugio, 0°27'S, 78°27'W, *Lawesson, Laessoe & Jorgensen 44155* (AAU).

One collection, *Ramsay & Merrow-Smith 978*, represents a mixed collection of both subspecies of *Eudema nubigena*.

**5. *Eudema rupestris*** Humboldt & Bonpland, Pl. Aequinoct. 2: 133. 1813; *Sisymbrium rupestre* (Humboldt & Bonpland) Weddell, Ann. Sci. Nat. Bot. 5(1): 290. 1864; *Hesperis rupestris* (Humboldt & Bonpland) Kuntze, Rev. Gen. Pl. 2: 935. 1891; *Draba humboldtii* Desvaux, J. Bot. (*Desvaux*) 3: 171. 1815; *Eutrema humboldtii* (Desvaux) Sprengel, Syst. Veg. 2: 880. 1825. TYPE: Ecuador. between Quito and Cuenca, Montña del Assuay, *Humboldt & Bonpland s.n.* (holotype, P!, fragments BAA!; isotypes, B!, E!).

*Eudema grandiflora* Planchon in W. J. Hooker, London J. Bot. 3: 620. 1844; *Sisymbrium grandiflorum* (Planchon) Weddell, Ann. Sci. Nat. Bot. 5(1): 290. 1864; *Hesperis planchoniana* Kuntze, Rev. Gen. Pl. 2: 936. 1891; *Brayopsis grandiflora* (Planchon) Gilg & Muschler, Bot. Jahrb. Syst. 42: 482. 1909. TYPE: Ecuador. Andes, monte Assuay, 15,000 ft. [ca. 4570 m], *Jameson s.n.* (holotype, not seen; isotypes, K!, NY!).

Plants with a stout, much-branched caudex covered with petiolar remains of previous years. Leaves basal, rosulate, petiolate, numerous, glabrous; petioles persistent, not ciliate, strongly flattened at base, 7–10 mm; leaf blade linear to narrowly oblanceolate, 5–17 mm, 1–3 mm wide, glabrous, base attenuate, margin entire, apex rounded. Sepals narrowly oblong to suboblanceolate, (5–)6–7 mm, ca. 2 mm wide, erect, margin scarious, subapically sparsely pubescent. Petals white, oblong to sublinear, (8–)10–12 mm, 2–3 mm wide. Filaments erect, slender, (4–)5.5–6.5 mm; anthers narrowly oblong, 1.2–1.5 mm. Fruiting pedicels glabrous, 1–1.4 cm. Fruit oblong, straight, subterete to slightly angustiseptate, rounded at base and apex; valves thin, glabrous, with a conspicuous midvein; septum reduced to a rim; style slender, (2.5–)3–3.5 mm. Seeds 20–26 per fruit, dark brown to blackish, ovoid, slightly compressed, 1.2–1.7 mm, 0.8–1.1 mm wide, conspicuously reticulate; funicles thick, 0.2–0.5 mm.

**Flowering:**

Habitat: grass páramo, sandy soil in burnt and regenerated páramo

Elevation: 3400–4200 m.

Distribution: Ecuador (Azuay).

Specimens examined: ECUADOR. Andes above Quito, 14,000 ft., *Jameson s.n.* (US). **Prov. Azuay:** Cuenca-Soldados rd., Las Cajas Recreational Area, 3–10 km above Soldados, 79°17'W, 02°54'S, *Luteyn, Jørgensen & Ulloa 14319* (MO, NY); Mount Azuay, *Spruce 6014* (K); Parque Nacional Cajas, Páramo de Soldados, Cuenca-San Joaquán-Soldados rd, pass above Soldados, 2°54'4"S, 79°17'13"W, *Jorgensen, Ulloa, Narváez, Laegaard & Eben 1736* (MO, NY).

**6. *Eudema werdermannii*** O. E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 10: 462. 1928;

TYPE: Chile. Prov. Atacama, Depto. Copiapó, Cord. Río Figueroa, Co. Paredones, ca. 4300

m, Jan 1926, *E. Werdermann* 974 (holotype, B!, fragments BAA!; isotypes, BAA!, BM!, CAS!, E!, F!, G, GH!, K!, LIL!, M!, MO!, NY!, S!, UC!, US!, Z!).

Plants caespitose rhizomatous, forming dense cushions; rhizomes branched, 1–2.5 mm wide, with sessile, ovate to lanceolate scales at nodes. Leaves rosulate, somewhat fleshy, petiolate; petioles ciliate with simple or furcate trichomes, somewhat flattened at base; leaf blade narrowly oblanceolate to spatulate, (3–)8–20(–30) mm, (0.7–)1–2(–3.5) mm wide, abaxially glabrous, adaxially densely pubescent with dendritic trichomes, rarely glabrescent or only ciliate, base attenuate, margin entire, apex obtuse or rounded. Sepals oblong, 3–4 mm, 1.4–1.8 mm wide, erect, sparsely pubescent with dendritic trichomes, margin scarious; petals creamy white to yellow, oblanceolate, (4.5–)5–7 mm, 1.5–2 mm wide, apex rounded; filaments erect, slender, 2.5–3.5 mm; anthers oblong, 0.8–1 mm. Fruiting pedicels 3.5–20 mm, glabrous. Fruit sessile, suborbicular, 2.5–3 mm in diam., strongly latiseptate; valves thin, obscurely veined; septum reduced to a narrow rim, hyaline; style 0.2–0.8 mm. Seeds 6–10 per fruit, brown, ovoid, 0.9–1.2 mm, 0.6–0.8 mm wide.

Flowering: Oct–Jan.

Habitat: gravel, puna vegetation, volcanic sand.

Elevation: 3800–4700 m.

Distribution: Argentina (Jujuy, La Rioja, Salta, San Juan), Peru (Arequipa).

Specimens examined: **ARGENTINA. La Rioja:** Dep Sarmiento, entre Paso de las Pirca Negras y El Zañyón, Krapovickas & Hunziker 5810 (BAA), Krapovickas & Hunziker 5818 (BAB).

**Jujuy. Dep.** Humahuac: Mina Aguilar, Ruthsatz XXII/26 (LP). Dep. Susques: Veg, S Cerro Tuzgle, Werner 912 (**LIL**, LP). **Salta.** Dep. Poma: Quebrada del Gallo, Cabrera 8666 (LP). **San Juan:** Quebrada Ortiga, E part of Cordillera de la Ortiga, *Johnston* 6174 (BA, BACP, GH, K, LIL, P, S, US), *Johnston* 6290 (GH); Quebrada de Coucouta, between Las Vicuñitas and el Portezuelo de Coucouta, *Moreau* 30/87 (BA); Depto Iglesia, camino al Co. Las Tórtolas, 29°59'S, 69°45'W, Kiesling, Ruthsatz & Holz 8636 (K); Iglesia, Río Blanco cerca del Baño del Bollete, *Castellanos* 15523 (US); valle del Cura, Múlgara & Deginani 169 (BACP); reserva de San Quillermo, Rio Macho Muerto, ca. 7 km from refugio, *Nicora et al.* 8508 (BACP, P), Pujalte 58 (SI). **PERU. Arequipa:** Lake Salinas, *Sandeman* 4016 (K, OXF), *Sandeman* 3844 (K); Arequipa-Puno rd, N side of Laguna Salinas, *Straw* 2308 (US).

#### **Basic references:**

Al-Shehbaz, I. A. 1990. Generic limits and taxonomy of *Brayopsis* and *Eudema* (Brassicaceae). *J. Arnold Arb.* 71: 93–109.