

*pinnae* 30–40 per side, in lax groups of 3–9, nearly in one plane, linear, 10–14 times as long as wide, oblique to lobulate praemorse at apex, glabrous adaxially, with short spinules abaxially; middle *pinnae* 48–65 × 3.5–5 cm. *Peduncle* 21–107 cm long, ca. 10 mm in diam. at junction with rachis, densely armed with brown, to 2 cm long spines; rachis 20–44 cm long, densely covered with crimped, to 1.5 cm long spines, becoming shorter toward apex; *rachillae* 22–38; basal rachillae 40–53 cm long, with an up to 10 cm long basal flowerless part, 2–3 mm diam. in the androgynous part, covered between the flower groups with 0.5–1 cm long, crimped, black spines, distally very slender. *Staminate flowers* violet to white, with yellow anthers, 2.5–3 mm long; anthers linear, 0.9–1.2 × 0.5–0.7 mm. *Pistillate flowers* violet, 5–6 mm long; sepals rounded; petals acuminate; pistil sparsely covered with minute, applanate spinules. *Fruit* globose, 11–13 mm diam.; epicarp with minute, black spinules; endocarp 10–12 mm diam., with numerous shallow to deep pits, especially at apex.

**Illustrations.** Figs. 13C–D (pollen), 18B (distribution map), 21Z (middle *pinnae*), 23C (habit).

**Local names.** Cirquí (Antioquia).

**Distribution and habitat.** Known from the north-eastern slopes of the Colombian Cordillera Central (type locality), and the western slopes of Cordillera Occidental, between 1300 and 2000 m, often left over on pasture.

**Specimens examined.** COLOMBIA. ANTIOQUIA: Mun. de Frontino, Murri, rd. Nutibara–La Blanca, 1900–1950 m, 3 Jan 1982 (fl, fem fl, imm fr), *Galeano & Bernal 461* (COL, HUA), *462* (COL); Mun. de Urrao, quebrada La Agudelo, a tributary to Río Calles, 1300–1400 m, 14 Jun 1982, *Bernal & Galeano 330* (COL, HUA). RISARALDA: Pueblo Rico, Río Taibá, 1350 m, 13 Mar 1986 (fl, fem fl, imm fr), *Bernal et al. 958* (COL, FTG).

This subspecies includes plants with linear *pinnae* held more or less in one plane, densely armed inflorescences with relatively few, long, slender rachillae, and small spinulose fruits with a globose endocarp. In the northern part of Cordillera Central it co-occurs with subsp. *hirsuta*, and the two give the impression of being distinct in this area. In Cordillera Occidental it occurs at higher altitudes than subsp. *hirsuta*. To the south, leaves and inflorescences show a gradual transition to subsp. *intermedia*, found in Chocó and Valle. The subspecies is well characterized morphologically, but its pollen display a surprising variation in exine ornamentation. The neotype collected in Cordillera

Central (*Bernal & Tobón 1393*) has pollen with rugulate exine (Fig. 13C); pollen of *Bernal et al. 958*, collected in Cordillera Occidental, have perforate exine with numerous long, supracteal spines (Fig. 13D).

**10c. *Aiphanes hirsuta* subsp. *intermedia*** Borchsenius & Bernal, subsp. nov. Type. COLOMBIA. Chocó: San José del Palmar, 500 m E of town, 1300 m, 15 Mar 1991 (fl, fem fl, fr), *Bernal & Borchsenius 1962* (holotype, COL; isotypes, AAU, CHOCO, NY).

A subsp. *hirsuta* petiolo 43–80 cm longo, pinnis 44–81 cm longis, inflorescentia ramis 60–108, et fructu 11–15 mm diametro endocarpo longitudinaliter exarato differt.

*Stems* 1–4, each 2–8 m tall, 6–10 cm diam., densely armed. *Leaves* 5–7; sheath 40 cm long, densely armed; petiole 43–80 cm long; rachis 220–242 cm long, unarmed; *pinnae* 31–32 per side, in rather lax groups of 3–5 separated by 13–22 cm, narrowly cuneate to cuneate, 3.5–8 times as long as wide, finely plicate, glabrous adaxially, minutely spinulose abaxially, truncate to lobulate-praemorse at apex; middle *pinnae* 44–81 × 14–15 cm. *Peduncle* 15–85 cm long at flowering, to 120 cm in fruit, 8–25 mm diam. at apex, covered with black spines, to 3 cm long; rachis 50–75 cm long, with numerous spines, to 1 cm long proximally, fewer and shorter distally; *rachillae* 60–108, densely covered with brown spinules, ca. 0.3 mm long, and with some short spines proximally; basal rachillae 40–84 cm long, without flowers for 2–8 cm, ca. 4 mm diam. in the androgynous part, ca. 2 mm diam. distally. *Staminate flowers* ca. 1.5 mm long (dry), violet to white, anthers purple, pollen orange. *Pistillate flowers* 4–5 mm long (dry), purple; sepals rounded; petals acute; pistil with whitish yellow spinules proximally. *Fruit* dark red, 11–13 mm diam.; epicarp minutely spinulose; endocarp with 3 deep broad longitudinal furrows, almost without pits.

**Illustrations.** Figs. 13E–F, 14N (pollen), 18B (distribution map), 21Y (middle *pinnae*), 23D (habit).

**Distribution and habitat.** Western slopes of Cordillera Occidental in the departments of Chocó and Valle in central Colombia, 1300–2200 m, often left on pasture.

**Specimens examined.** COLOMBIA. CHOCÓ: Rd. Cartago–San José del Palmar, ca. 10 km E of San José, 1800 m, 2 Apr 1976 (fl, fr), *Dransfield et al. 4854* (BH, K); *ibid.*,

1600 m, 11 Nov 1985 (fl), *Lozano et al. 4903* (AAU, COL); (fl, fr), *Lozano et al. 4905* (AAU, COL). **VALLE:** rd. Cartago–San José del Palmar, 2 km from dividing line between Valle and Chocó, 2000 m, 16 Mar 1991 (fl, fem fl, imm fr), *Bernal & Borchsenius 1963* (AAU, COL, NY, TULV); basin of Río Dagua, Río San Juan, km 52–53 below Dagua, 1300–1500 m, 19 Mar 1947 (fl, fr), *Cuatrecasas 23885* (F); rd. Trujillo–Cristales, 1800 m, 13 Apr 1989 (fl, fem fl, imm fr), *Bernal & Devia 1555* (COL, TULV); rd. Queremal–El Danubio, 1300–1420 m, 24 Mar 1988 (fl, fr), *Bernal & Prado 1455* (COL, TULV).

This subspecies includes plants with long, narrowly cuneate pinnae, spiny inflorescences with 60–90 rachillae, and small to medium-sized fruit with longitudinally grooved endocarp having few pits. In the north it forms a transition to subsp. *kalbreyeri*; in the south it forms a transition to subsp. *fosteriorum*, which has more broadly cuneate pinnae, less spiny inflorescences, larger, glabrous fruits, and a more globose endocarp with numerous deep pits. In the central Chocó, subsp. *intermedia* occurs side by side with subsp. *hirsuta*, but at higher altitudes. Pollen of *A. hirsuta* subsp. *intermedia* has perforate, tectate exine and is spineless or provided with numerous supratectal warts or spines (Figs. 13E–F, 14N).

**10d. *Aiphanes hirsuta* subsp. *fosteriorum*** (H. E. Moore) Borchsenius & Bernal, stat. nov.

*Aiphanes fosteriorum* H. E. Moore, Gentes Herb. 8: 225, 226, fig. 92. 1951. Type. COLOMBIA. Nariño: Altaquer, 1150 m, 10 Nov 1946, *Foster & Foster 2117* (holotype, BH; isotypes, A, COL).

*Stems* 1–2 plus several suckers, to 10 m tall, 6–10 cm diam., armed with black, to 8 cm long spines, distally with old leaf sheaths. *Leaves* 4–6; sheath 60–80 cm long, armed with black, to 10 cm long spines; petiole 60–100 cm long, green, unarmed; rachis 210–260 cm long, unarmed; *pinnae* 17–24 per side, somewhat golden-green, in groups of (2–)3–4, in different planes, cuneate, 2.5–3 times as long as wide, lobulate praemorse at apex, glabrous adaxially, rough abaxially; middle pinnae 37–58 × 15–22 cm. *Peduncle* 110–170 cm long, 1–1.5 cm diam. at apex, with scattered brown, to 5 cm long spines; rachis 60–100 cm long, unarmed or with scattered spines like those on peduncle; *rachillae* 50–100, densely brown-spinulose; basal rachillae to 95 cm long, basally without flowers for up to 10 cm, 3–4 mm diam in the androgynous part. *Staminate flowers* pale violet, 1.5–2 mm long; anthers 0.6–0.8 mm long. *Pistillate flowers* 6–7 mm long; pistil glabrous. *Fruit* rose-red, globose, 16–22 mm diam; endocarp 15–19 mm diam., globose, deeply pitted.

**Illustrations.** Figs. 13B (pollen), 18B (distribution map), 21X (middle pinnae); Moore, 1951: 226, fig. 92.

**Distribution and habitat.** Western Andean slopes from the department of Valle in Colombia to northern Ecuador, at 900–1300 m.

**Specimens examined.** COLOMBIA. Nariño: Rd. Junín–Altaquer, km 10, 1200 m, 4 Oct 1985 (fl, fr), *Bernal & Galeano 895* (AAU, COL, K). **VALLE:** Río Chanchos, 300 m upstream from junction with Río Calima, Campment Calima III, 450–600 m, 16–19 Feb 1989 (fl), *Bernal et al. 1521* (COL).

ECUADOR. ESMERALDAS: Rd. Lita–San Lorenzo, km 8–18, 800–900 m, 14 May 1986 (fl, fr), *Balslev, Borchsenius, et al. 62102* (AAU, NY, QCA); 13 Sep 1987 (juv), *Skov & Borchsenius 64742* (AAU); 12 Nov 1987 (fl, fem fl, imm fr), *Skov, Borchsenius, et al. 64819* (AAU, QCA); rd. Lita–Buenos Aires, km 12, 1400 m, *Dodson & Gentry 17582* (QCNE).

This subspecies includes the largest plants in the species, with cuneate, lobulate praemorse pinnae and weakly armed inflorescences with up to 100 rachillae. It is set apart by several characters: glabrous pistil; large fruits, ca. 16–22 mm diam, with deeply pitted endocarp; and pollen with fusing, supratectal clavae giving a rugulate surface (Fig. 13B).

**11. *Aiphanes leiostachys*** Burret, Notizbl. Bot. Gart. Berlin-Dahlem 11: 570. 1932. Type. COLOMBIA. Antioquia: Buenavista, Wald, 850 m, 18 Feb 1880, *Kalbreyer 1429* (B<sup>†</sup>). Neotype (Bernal et al., 1989). COLOMBIA. Antioquia: Mun. de San Carlos, 3 km N of village, quebrada La Chorrera, 1100 m, 22 Mar 1981, *Henao et al. 299* (holoneotype, COL; isoneotypes, AAU sterile, HUA).

Caespitose, with up to 10 stems, these 3.5–5 m tall, ca. 3 cm diam., gray, sparsely armed with slender spines, to 3 cm long. *Leaves* 11, horizontally held, arranged in 3 vertical rows; sheath ca. 18 cm long, with a dense light brown indument, densely armed with black, to 1 cm long spines; petiole 14–16 cm long, green, with a brown, caducous indument, armed with many black spines, to 5 cm long; rachis 102–108 cm long, with indument and spines like sheath, but spines fewer; *pinnae* 17–20 per side, subregularly inserted in lax groups of 2–4, in one plane, plicate, rigid, cuneate, 3–6 times as long as wide, incised-praemorse, with an up to 7 cm long finger-like projection on the distal margin, adaxial side glabrous, abaxial side very minutely spinulose, with a single black, 3–4 cm long spine basally on the midrib; basal pinnae 12–17 × 2–4 cm; middle pinnae 21–37 × 6–7