

passes are relatively low. *Aiphanes simplex* is commonly encountered in patches of primary or secondary forest, sometimes growing near small streams, at 800–2200 m, most abundant between 1600 m and 2100 m, where it may be a dominant component of the shrub layer.

Specimens examined. COLOMBIA. ANTIOQUIA: Mun. de Medellín, 5 km E of the city, quebrada Santa Helena, 1800 m, 30 Oct 1980 (imm fr), *Galeano et al.* 262 (COL, K), 266 (COL); rd. to Santa Helena, km 8–12, 1600 m, 26 Mar 1987 (fem fl), *Callejas & Escobar* 3280 (HUA, NY); Fredonia, 20 Dec 1920 (fl), *Toro* 852 (MEDEL, NY); Palmitas, quebrada Miserengo, 1900–2000 m, 18 Mar 1979 (fl, imm fr), *Galeano et al.* 14 (COL, HUA). CAUCA: El Tambo, basin of Río Patía, Alto Los Angeles, 1100–1700 m, 20 Aug 1949 (fl), *Idrobo & Fernandez* 198 (COL); Palacé, Oct 1945 (st), *Yepes* 1070 (COL); Popayan, 1700–1800 m, Nov 1889 (fem fl, fr), *Lehmann B.T.* 383 (GH, K, NY). QUINDIO: Bremen, 15 km N of Armenia, 1950 m, 29 Jan 1989 (fem fl), *Gentry et al.* 65315 (HUQ, MO); Circasia, finca El Bosque, quebrada El Bosque, 1185 m, 21 Dec 1989 (fr), *Vélez et al.* 817 (HUQ); Vereda Barcelona Alta, finca Buenos Aires, 1605 m, 7 Apr 1991 (imm fr), *Agudelo et al.* 1126 (COL, HUQ n.v.); Córdoba, Vereda El Jardín Alto, 1860 m, 31 Mar 1987 (fl), *Arbeláez et al.* 2424 (HUQ); Quimbaya, vereda La Carmelita, 1430 m, 30 Jul 1987 (fl), *Arbeláez* 2216 (HUQ). RISARALDA: Pereira, La Suiza, trail to Callejones, 1950 m, 3 Jun 1989 (fl), *Franco et al.* 2672 (COL). VALLE: Alto Mercedes, 2000 m (fl), *Dryander* 1288 (B); Argelia, vereda Las Brisas, 2140 m, 21 Jan 1983 (fem fl), *Franco et al.* 1681 (COL); Bitaco, 1 Apr 1959 (fl, fr), *De Leon* 126 (BH); Cali, basin of Río Pichindé, Peñas Blancas, 1700–1900 m, 1 Jul 1938 (fem fl, imm fr), *Duque-Jaramillo* 1320 (COL); 15 Jan 1947 (imm fr), *Duque-Jaramillo* 4531 (COL); 8 May 1977 (fl, fr), *Benalcázar & Silva* 11 (COL); 1 Oct 1977 (fr), *Benalcázar & Silva* 101 (COL); *ibid.*, 3 km N of El 18 on rd. to Pavas, 1870 m, 19 Mar 1988 (fl, fr), *Bernal* 1442 (COL, TULV); El Cairo, rd. La Carbonera-Perla Roja, km 3.5, 1950 m, 16 Mar 1991 (fl, fr), *Bernal & Borchsenius* 1964 (AAU, BH, COL, NY, TULV); El Silencio, Yanacanas, 1900–2200 m, 28 Feb 1939 (fem fl), *Killip & García* 33804 (COL); Mun. de Yumbo, finca La Samaria, NE of Darien, near lago Calima, 1700 m, 14 Feb 1984 (ab fr), *Juncosa* 2172 (MO, NY); Santa Helena, above Topacio, edge of Los Farallones de Cali National Park, 1970 m, 11 Dec 1985, *Gentry et al.* 53102 (NY); Tuluá, km 6 from La Morelia toward Monteloro, 1600 m, 16 Mar 1988 (fl), *Bernal et al.* 1435 (COL, CUV, FTG, TULV); Baga de la Tulia, 1850 m, 30 Oct 1944 (fr), *Cuatrecasas* 18377 (BH, COL, F); rd. Cali–Buenaventura, km 22, 1800 m, 13 Oct 1983, *Escobar* 2673 (HUA); rd. Río Frio–Salonika km 8, quebrada El Almendronal, 21 Nov 1974 (st), *Moore et al.* 10197 (BH, COL); upper Río Calima, between El Pital and quebrada La Cristalina, 830 m, 22 Feb 1989 (fl), *Bernal et al.* 1538 (COL, TULV).

Aiphanes simplex is characterized by its caespitose habit, with up to 20, to 4 m tall, 1–2 cm thick stems, cuneate, truncate praemorse pinnae, yellow spines on leaf sheaths, and normally spicate inflorescence. Individuals with branched inflorescences with up to 12

rachillae have been found in marginal areas of the species distributional range, i.e., the upper Río Patía valley (*Idrobo* 198) and the western slopes of Cordillera Occidental in the department of Valle (*Bernal* 1538), indicating a possible transition to the closely related *A. erinacea*. The arguments for keeping the two as separate species are the following: 1) *Aiphanes simplex* is sufficiently well known for it to be said that in the Río Cauca basin itself inflorescences are always spicate, and likewise *A. erinacea* is sufficiently known in Ecuador and southern Colombia for it to be said that spicate inflorescences do not occur there; and 2) individuals of *A. simplex* with branched inflorescences can still easily be referred to this species by their thin stems and truncate praemorse, rather than incised praemorse, pinnae. Apart from a single atypical collection from the Pacific coast near Buenaventura, there are no collections of *A. erinacea* further north than the department of Nariño, but this may be due to the poor exploration of the montane forests in the department of Cauca. Thus it is possible that the distributions of *A. erinacea* and *A. simplex* form a continuum and that the branched inflorescences sometimes encountered in *A. simplex* signify that some exchange of genetic material occurs between the two.

18. *Aiphanes spicata* Borchsenius & Bernal, sp. nov.

Type. PERU. San Martín: Rioja (limit with Amazonas, Bongara), km 150 on rd. from Bagua Grande to Moyobamba, ca. 1800 m, 26 May 1990 (fl, fem fl, fr), *Kahn & Borchsenius* 2651 (holotype, AAU; isotypes, NY, USM).

Aiphanes acauli Galeano & Bernal similis sed pinnae aggregatis et floribus flavo virentibus differt.

Solitary, acaulescent or with a horizontal, subterranean stem, to 30 cm long, 2–5 cm diam. *Leaves* 9–12, erect and arching; sheath 14–20 cm long, with numerous black spines, to 8 cm long; petiole 16–25 cm long, armed like sheath, but spines fewer; rachis 42–80 cm long, green, with a brown, caducous indument, unarmed or with scattered, black spines, to 5 cm long; *pinnae* 14–16 per side, nearly regularly inserted or in groups of 2–4, these occupying 3–7 cm along the rachis, separated by 9–11 cm, all pinnae more or less in one plane, strongly plicate, middle pinnae 17–22 × 1–2.5 cm, linear or narrowly cuneate, 10–18 times as long as wide, obliquely praemorse at apex, with an up to 2 cm long finger-like projection on the distal margin, both sides with scattered, peltate hairs and few

minute spinules, margins lined with black spinules, ca. 1 mm long. *Inflorescence* interfoliar, erect, spicate; prophyll 14–16 cm long, ca. 1 cm wide; peduncular bract 30–50 cm long, 1–1.5 cm wide, thin, with minute, black spinules, soon disintegrating; peduncle 45–110 cm long, 3–4 mm diam. at apex, green, with a thin, brown, caducous indument, unarmed or covered with black, thin, to 3 cm long spines; *spike* 14–26 cm long, 5–8 mm diam., with a brown, caducous indument, covered with minute, black spinules, basal $\frac{2}{3}$ with triads, distally staminate; flower groups sunken into deep, elongate cavities in the spike, each subtended by a 3–4 mm long bract, covering the flower group before anthesis. *Staminate flowers* 3–4 mm long, 3–4 mm wide, yellow in center, with light green petals; sepals imbricate, carinate, covering the petals for $\frac{2}{3}$ of their length, 3–3.5 \times 4–5 mm; petals free, valvate, 3.5–4 \times 2.5–3 mm; filaments ca. 1 mm long, anthers 1.1–1.4 \times 0.9–1.1 mm; pistillode minute, trifid; receptacle swollen, ca. 0.5 mm thick. *Pistillate flowers* (at anthesis) 4–5 mm long, ca. 4 mm wide, light greenish yellow; sepals imbricate, broadly ovate, shorter than the petals, enclosed in the floral pit, 2.5–3.5 \times 4–5 mm; petals connate for $\frac{1}{2}$ their length, valvate distally, 4–5 \times 3–4 mm; staminodial cup truncate, 3–4 mm high; pistil ca. 4 mm high, 3 mm diam., glabrous. *Fruits* 10 mm long, 9 mm wide.

Illustrations. Figs. 1D (habit), 5C (leaf), 12H, 13C (pollen), 19C (distribution map), 21R (middle pinnae).

Distribution and habitat. Known only from two nearby localities in northeastern Peru, in *Dictyocaryum lamarckianum*-dominated montane forest at ca. 2000 m.

Specimens examined. PERU. SAN MARTÍN: Prov. Rioja (limit with Amazonas, Prov. Bongara): 152 km from Bagua Grande, ca. 1800 m, 26 May 1990 (fl, fem fl), *Kahn & Borchsenius 2646* (AAU, COL, K, USM).

Aiphanes spicata resembles *A. acaulis*, from which it differs in size and color of flowers (Table II). Pollen of the two species is also different: that of *A. acaulis* has finely reticulate tectum with fusing supracteal clavae (Fig. 11D), whereas that of *A. spicata* has a reticulate, smooth tectum (Fig. 13C). No other species combines acaulescent habit, linear or narrowly cuneate pinnae, and spicate inflorescences. The known populations of *A. acaulis* and *A. spicata* are separated by the Andean Cordillera and more than 2000 km, including some of the best-collected areas with respect to palms, in Ecuador and Colombia;

furthermore, the two species occur at different altitudes. The acaulescent habit and the spicate inflorescences are considered derived characters in *Aiphanes*, and the striking morphological similarity may be due to convergence rather than to a common, widely distributed ancestor.

19. *Aiphanes tricuspidata* Borchsenius, Bernal & Ruiz, *Brittonia* 41: 156, fig. 1. 1989. Type. ECUADOR. El Oro: rd. from Machala to Naranjal, km 33, 8 km E along dirt rd. leaving from Río Boníto, 380 m, 19 Nov 1987, *Skov, Borchsenius, Blicher Mathiesen, & Bang Klitgaard 64836* (holotype, AAU; isotypes, COL, K, NY, QCA, QCNE).

Solitary. *Stem* erect or sometimes procumbent, to 4.5 m tall, 2.5–6 cm diam., light brown, hard, unarmed or with black spines, to 5 cm long, base frequently supported by a cone of prop roots, up to 15 cm high. *Leaves* 8–10, erect and arching, lower ones recurving; sheath, petiole and rachis with a brown, caducous indument; sheath 23–37 cm long, armed with brown to yellow spines, to 5 cm long; petiole 8–18 cm long; rachis 74–120 cm long, spinulose, unarmed or with scattered, brown to yellow spines abaxially, to 5 cm long; *pinnae* 11–14 per side, inserted in groups of 2 or rarely 3 separated by 10–20 cm, in different planes, broadly cuneate, 1–3 times as long as wide, dark green adaxially, paler abaxially, strongly tricuspitate, with an up to 9 cm long finger-like projection on the distal margin, adaxial side smooth or rough, abaxial side minutely spinulose or rarely almost glabrous, midrib abaxially with 0–5 yellow to black, to 5 cm long spines; basal pinnae 6–18 \times 1–13 cm; middle pinnae 11–29 \times 12–20 cm; apical pinnae 1–3 ribbed, quite variable in size and shape, 8–23 \times 6–30 cm. *Inflorescence* interfoliar, erect to drooping, branched to 1 order, sometimes with a few rachillae branched to second order; prophyll 20–56 cm long, 1–3.5 cm wide; peduncular bract 100–170 cm long, 2–2.5 cm wide, with a brown caducous indument, unarmed or with some yellow spines, to 1 cm long; peduncle 67–148 cm long, 4–6 mm diam. at junction with rachis, with a brown, scaly, caducous indument, and many yellow spines, to 1 cm long; rachis 15–55 cm long, unarmed or basally armed like that on the peduncle; *rachillae* 12–52, minutely spinulose, each subtended by a small bract, ca. 5 mm long; basal rachillae 28–50 cm long, sometimes without flowers for up to 6 cm, with triads for ca. $\frac{1}{2}$ of the length, in this part 2 mm diam., distally ca. 1 mm diam., with staminate dyads; apical