

adaxially; pinnae 5(3–6) per side of rachis; basal pinna 10.7(9.7–11.5) cm long, 1.1(0.8–1.8) cm wide, forming an angle of 60(45–72)° with the rachis; apical pinna 8.2(7.0–10.0) cm, 7.5(6.3–11.0) cm wide, forming an angle of 42(38–48)° with the rachis. *Inflorescences* unbranched; prophylls and peduncular bracts not ribbed with elongate, unbranched fibers, flattened, deciduous or persistent; prophylls 8.5(6.7–11.2) cm long, not short and asymmetrically apiculate, the surfaces not ridged, without unequally wide ridges; peduncular bracts 7.3(5.9–10.5) cm long, well-developed, inserted 1.1(0.5–2.3) cm above the prophyll; peduncles 8.7(6.0–14.5) cm long, 2.1(1.5–2.8) mm in diameter; rachillae 1, 8.4(5.7–10.0) cm long, 3.4(2.6–4.1) mm in diameter, the surfaces with spiky, fibrous projections or ridges, drying brown or yellow-brown, without short, transverse ridges, not filiform and not narrowed between the flower pits; flower pits usually spirally arranged, glabrous internally; proximal lips without a central notch before anthesis, not recurved after anthesis, not hood-shaped; proximal and distal lips drying the same color as the rachillae, not joined to form a raised cupule, the proximal lip margins overlapping the distal lip margins; distal lips well-developed; staminate and pistillate petals not emergent, not valvate throughout; staminate flowers deciduous after anthesis; stamens 6; thecae diverging at anthesis, inserted onto bifid and well-developed, non-jointed connectives; anthers short and curled over at anthesis; non-fertilized pistillate flowers deciduous after anthesis; staminodial tubes crenulate or shallowly lobed at the apex, those of non-fertilized pistillate flowers not projecting and persistent after anthesis; *fruits* 8.5(7.8–9.9) mm long, 6.0(4.6–7.2) mm in diameter, the bases without a prominent stipe, the apices not conical, the surfaces not splitting at maturity, without fibers emerging, bumpy from the numerous, subepidermal, tangential, short fibers present, these coming to a point at fruit apices; locular epidermis without operculum, smooth, without pores.

Distribution and habitat:—From 6°10'–7°08'N and 72°54'–73°27'W in the Eastern Cordillera in Colombia at 1800 m elevation in montane rainforest (Fig. 36).

Taxonomic notes:—*Geonoma santanderensis* was compared to *G. monospatha* by Galeano and Bernal (2002). However, it appears closely related to a group of species within the *G. stricta* clade comprising *G. aspidiifolia* and *G. oligoclona*. All three species share internodes covered with reddish or brownish scales, especially in their distal part, rachillae surfaces with spiky, fibrous projections or ridges, and staminodial tubes lobed at the apex with the lobes not spreading at anthesis and not acuminate. *Geonoma santanderensis* differs from *G. aspidiifolia* in its fruits which are bumpy from the numerous, subepidermal, tangential, short fibers present; and from *G. oligoclona* in its prophyll which is not short and asymmetrically apiculate.

Subspecific variation:—No traits, except for stem branching, vary within this species. The specimens come from two separate areas, but there are too few specimens to test for differences between these.

55. *Geonoma schizocarpa* Henderson, *sp. nov.* (Appendix IV, Plates 58 & 59)

A spectebus affinibus crusta fructuum profunde scindens differt.

Type: PERU. Amazonas: al lado de Huampami, 18 July 1974, R. Kyap 1212 (holotype MO!).

Plants 2.2(1.0–5.0) m tall; stem height no data, 2.8 cm in diameter, branching no data, not cane-like; internodes 0.3 cm long, not scaly. *Leaves* irregularly pinnate, not plicate, bases of blades running diagonally into the rachis; sheaths 12.0 cm long; petioles drying green or yellowish; rachis 90.0(88.0–92.0) cm long, 7.9(6.2–8.7) mm in diameter; veins raised and rectangular in cross-section adaxially; pinnae 14 per side of rachis; basal pinna 34.0 cm long, 1.2(0.8–1.6) cm wide, forming an angle of 67(51–82)° with the rachis; apical pinna 20.0 cm long, 4.9(2.8–6.5) cm, forming an angle of 31(30–33)° with the rachis. *Inflorescences* unbranched; prophylls and peduncular bracts ribbed with elongate, unbranched fibers, both bracts tubular, narrow, elongate, closely sheathing the peduncle, more or less persistent; prophylls 14.5 cm long, not short and asymmetrically apiculate, the surfaces not ridged, without unequally wide ridges; peduncular bracts length no data, well-developed, inserted 0.6 cm above the prophyll; peduncles 93.0 cm long, 5.7(4.6–7.2) mm

in diameter; rachillae 1, 22.6(15.5–36.0) cm long, 9.8(7.7–11.5) mm in diameter, the surfaces without spiky, fibrous projections or ridges, drying brown or yellow-brown, without short, transverse ridges, not filiform and not narrowed between the flower pits; flower pits spirally arranged, glabrous internally; proximal lips with a central notch before anthesis, often the two sides of the notch overlapping, not recurved after anthesis, not hood-shaped; proximal and distal lips drying the same color as the rachillae, not joined to form a raised cupule, the proximal lip margins overlapping the distal lip margins; distal lips well-developed; staminate flowers persistent post-anthesis or deciduous post-anthesis; staminate and pistillate petals not emergent, not valvate throughout; stamens 6; thecae not diverging at anthesis, inserted onto well-developed, non-split, jointed connectives, alternately long and short; anthers short at anthesis, remaining straight and parallel; non-fertilized pistillate flowers deciduous after anthesis; staminodial tubes lobed at the apex, the lobes spreading at anthesis, acuminate, those of non-fertilized pistillate flowers not projecting and persistent after anthesis; *fruits* 14.0(12.3–15.5) mm long, 8.9(8.6–9.3) mm in diameter, the bases without a prominent stipe, the apices not conical, the surfaces splitting deeply and longitudinally at maturity to reveal mesocarp with dense layer of radial fibers, without fibers emerging, not bumpy, not apiculate; locular epidermis with operculum, smooth, without pores.

Distribution and habitat:—From 4°15'–4°30'S and 78°10'–78°30'W in Peru (Amazonas) at 225 m elevation in lowland rainforest (Fig. 37).

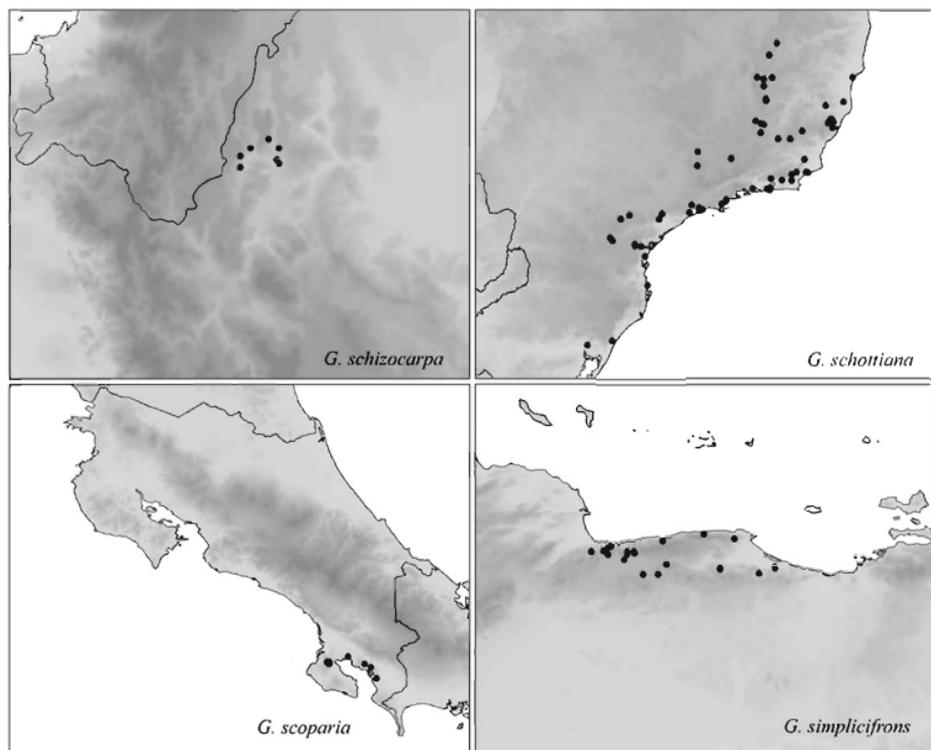


FIGURE 37. Distribution maps of *Geonoma schizocarpa*, *G. schottiana*, *G. scoparia*, and *G. simplicifrons*.

Taxonomic notes:—*Geonoma schizocarpa* is a member of the *G. macrostachys* clade. Within this it is most closely related to *G. macrostachys*, *G. multisecta*, *G. paradoxa*, and *G. poiteauana*. It differs from these in

its fruits surfaces which split deeply and longitudinally at maturity to reveal mesocarp with a dense layer of radial fibers.

Subspecific variation:—One trait (staminate flower persistence) varies within this species. Two of 10 specimens have deciduous staminate flowers.

56. *Geonoma schottiana* Martius (1826: 143). Type: BRAZIL. Rio de Janeiro: no locality, no date, *H. Schott 4111* (holotype M!).

Geonoma schottiana var. *angustifolia* Drude (1882: 492). Lectotype (here designated): BRAZIL. Rio de Janeiro: Petropolis, 6 April 1877, *A. Glaziou 9011* (lectotype BR!, duplicates K!, FI!, P!).

Geonoma schottiana var. *latifolia* Drude (1882: 492). Lectotype (here designated): BRAZIL. Rio de Janeiro: Restinga de Mauá, 8 June 1876, *A. Glaziou 8493* (lectotype BR!, duplicate P!).

Geonoma hoehnei Burret (1930a: 231). Type: BRAZIL. São Paulo: Japuhya, 17 April 1926, *F. Hoehne & A. Gehrt 17391* (holotype SP!).

Plants 2.9(1.5–6.0) m tall; stems 1.7(0.3–3.5) m tall, in diameter, no data, solitary, cane-like; internodes no data, yellowish and smooth. *Leaves* 15(7–24) per stem, regularly pinnate, the pinnae with 1 main vein and 2 lateral veins on either side of main vein, not plicate, bases of blades running diagonally into the rachis; sheaths 26.9(23.5–33.0) cm long; petioles 57.8(30.0–87.0) cm long, drying green or yellowish; rachis 70.4(44.0–118.0) cm long, 5.1(2.6–8.9) mm in diameter; veins raised and rectangular in cross-section adaxially; pinnae 26(10–38) per side of rachis; basal pinna 36.8(17.5–59.0) cm long, 0.5(0.2–2.1) cm wide, forming an angle of 49(25–90)° with the rachis; apical pinna 22.4(12.5–36.5) cm long, 3.0(0.6–10.2) cm wide, forming an angle of 21(7–34)° with the rachis. *Inflorescences* unbranched or branched 1–3 orders; prophylls and peduncular bracts not ribbed with elongate, unbranched fibers, flattened, deciduous or persistent; prophylls 26.4(16.0–36.5) cm long, not short and asymmetrically apiculate, the surfaces not ridged, without unequally wide ridges; peduncular bracts 20.2(8.6–31.0) cm long, well-developed, inserted 18.8(5.0–46.0) cm above the prophyll; peduncles 37.7(18.0–73.5) cm long, 5.1(1.6–10.6) mm in diameter; rachillae 16(1–69), 20.6(7.5–37.0) cm long, 1.9(0.7–3.5) mm in diameter, the surfaces without spiky, fibrous projections or ridges, drying brown or yellow-brown, without short, transverse ridges, not filiform and not narrowed between the flower pits; flower pits tricusately arranged, the groups not closely spaced nor consistently arranged throughout the rachillae, glabrous internally; proximal lips without a central notch before anthesis, not recurved after anthesis, not hood-shaped; proximal and distal lips drying darker brown than the rachillae, not joined to form a raised cupule, the proximal lip margins overlapping the distal lip margins; distal lips well-developed; staminate and pistillate petals not emergent, not valvate throughout; staminate flowers deciduous after anthesis; stamens 6; thecae diverging at anthesis, inserted almost directly onto the filament apices, the connectives bifid but scarcely developed; anthers short and curled over at anthesis; non-fertilized pistillate flowers deciduous after anthesis; staminodial tubes crenulate or shallowly lobed at the apex, those of non-fertilized pistillate flowers not projecting and persistent after anthesis; *fruits* 9.3(7.4–13.4) mm long, 7.5(5.9–10.6) mm in diameter, the bases with a prominent, asymmetric stipe, the apices conical with rounded apices, the surfaces not splitting at maturity, without fibers emerging, not bumpy, not apiculate; locular epidermis without operculum, smooth, without pores.

Distribution and habitat:—From 16°35'–29°46'S and 39°39'–51°08'W in the Atlantic Coastal Forest and inland areas of southeastern Brazil (Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo) at 747(3–1600) m elevation in lowland to montane tropical rainforest or gallery forest (Fig. 37).

Taxonomic notes:—*Geonoma schottiana* is a member of a group of species from the Atlantic Coastal Forest and adjacent Cerrado (the *G. schottiana* clade, also including *G. elegans*, *G. pauciflora*, and *G. pohliana*). Although the group is well-supported, all constituent species are extremely variable internally. *Geonoma schottiana* differs from other species in the group by its regularly pinnate leaves, the pinnae with 1 main vein and 2 lateral veins on either side of main vein.