67h. *Geonoma undata* subsp. *tacarcunensis* Henderson, *subsp. nov.* (Appendix IV, Plate 67)

A subspeciebus aliis foveis remote sitis differt.

Type: PANAMA. Darién: Parque Nacional del Darién, Panama/Colombia border, near gold mine at head waters of N branch of Rio Pucuro, slopes of Cerro Tacarcuna, ca. 6 km N of Cerro Mali, 8°09'N 77°15'W, 1300–1500 m, 27 October 1987, *G. de Nevers, B. Hammel & H. Herrera 8511* (holotype NY!, isotype MO!).

Leaves veins raised and rectangular in cross-section adaxially; basal pinna 2.6(2.4–2.7) cm wide; apical pinna no data. *Inflorescences* prophyll margins with irregular, spine-like projections; flower pits usually spirally arranged, distantly spaced.

Distribution and habitat:—At 8°09'N and 77°15'W on Cerro Tacarcuna on the Panama-Colombia border at 1612(1400–1825) m elevation in montane rainforest (Fig. 43).

67i. *Geonoma undata* subsp. *tumucensis* Henderson, *subsp. nov.* (Appendix IV, Plate 68)

A subspeciebus aliis foveis decussatis differt.

Type: SURINAME. Inselberg Talouakem, Massif des Tumuc-Humac, 2°29'N, 54°45'W, 620 m, 16 August 1993, *J.-J. de Granville, P. Acevedo, A. Boyer & L. Hollenberg 12322* (holotype NY!, isotype US!).

Leaves veins raised and rectangular in cross-section adaxially; basal pinna 3.0 cm wide; apical pinna no data. *Inflorescences* prophyll margins with irregular, spine-like projections; flower pits decussately arranged, not closely spaced.

Distribution and habitat:—From 2°15'–2°29'N and 54°25'–54°45'W on the Tumuc-Humac mountains in French Guiana and Suriname at 610(600–620) m in lowland rainforest (Fig. 44).

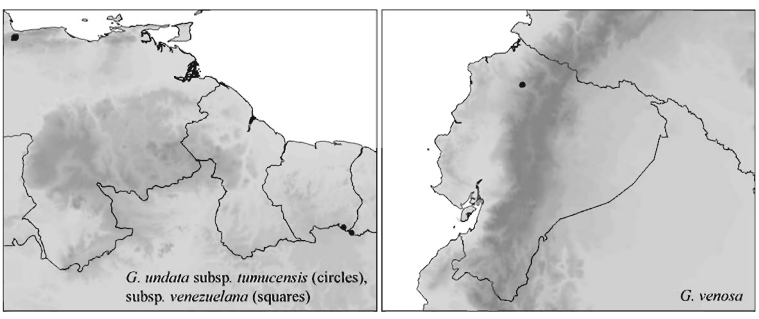

FIGURE 44. Distribution maps of *Geonoma undata* subsp. *tumucensis*, *G. undata* subsp. *venezuelana* and *G. venosa*.

67j. *Geonoma undata* subsp. *venezuelana* Henderson, *subsp. nov.* (Appendix IV, Plates 69–71)

A subspeciebus aliis pinnis basalibus atque apicalibus angustis differt.

Type: VENEZUELA. Carabobo: Mpio. Bejuma, parte superior de la Fila La Mesa, Valle de Chirgua, finca Monte Sacro, 1250–1300 m, 28 November–1 December 1996, *F. Stauffer, A. Fernández, R. Riina & K. Walther-Weissbeck 262* (holotype VEN *n.v.*, isotype NY!).

Leaves veins raised and rectangular in cross-section adaxially; basal pinna 0.5(0.4–0.5) cm wide; apical pinna 1.7 cm wide. *Inflorescences* prophyll margins with irregular, spine-like projections; flower pits usually spirally arranged, not distantly spaced.

Distribution and habitat:—From 10°12'–10°15'N and 68°07'–68°10'W on the Coastal Range in Venezuela at 1362(1275–1450) m elevation in montane rainforest (Fig. 44).

68. *Geonoma venosa* Henderson, *sp. nov.* (Appendix IV, Plate 72)

A speciebus affinibus venis prominentibus atque rachillis tenuibus differt.

Type: ECUADOR. Imbabura: Cotacachi, Parroquia García Moreno, Reserva Biológica Los Cedros, 0°19'N, 78°46'W, 1470 m, 25 October 2005, *H. Vargas, W. Defas & D. Reyes 6282* (holotype NY!, isotype MO *n.v.*).

Plants 2.5(2.0–3.0) m tall; stems no data; internodes no data. *Leaves* undivided or irregularly pinnate, not plicate, bases of blades running diagonally into the rachis; sheaths no data; petioles 13.5 cm long, drying green or yellowish; rachis 27.5 cm long, 2.8(2.0–3.6) mm in diameter; veins raised and rectangular in cross-section adaxially; pinnae 1–? per side of rachis; basal pinna length no data, 14.7 cm wide, forming an angle of 38(35–40)° with the rachis; apical pinna 24.5 cm long, 12.3 cm wide, forming an angle of 30(29–30)° with the rachis. *Inflorescences* branched at least 3 orders; prophylls and peduncular bracts no data; peduncles no data; rachillae 8.6(7.0–10.2) cm long, 0.9(0.8–0.9) mm in diameter, the surfaces without spiky, fibrous projections or ridges, drying brown, with faint to pronounced, short, transverse ridges, filiform with extended narrowed sections between the flower pits; flower pits alternately arranged (sometimes distorted by twisting and contracting of rachillae), sometimes decussately, then the groups not 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 the same color as the rachillae, joined to form a raised cupule, the margins not overlapping; 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* 8.1 mm long, 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 0°18'–0°19'N and 78°46'–78°47'W on western Andean slopes in Ecuador (Reserva Biológica Los Cedros) at 1465(1460–1470) m elevation in montane rainforest (Fig. 44).

Taxonomic notes:—*Geonoma venosa* is a member of a group of closely related species, the *G. lanata* clade. It shares all character states with *G. tenuissima*, but the only two specimens known are missing prophylls and peduncular bracts, so that five characters cannot be scored. Given its larger fruits (8.1 mm long and 7.2 mm in diameter versus 5.3(4.6–6.0) cm long and 4.8(4.1–5.5) mm in diameter), veins raised and rectangular in cross-section adaxially (versus not raised), and higher elevation habitat (1465(1460–1470) m versus 597(520–700) m elevation) it is kept separate from *G. tenuissima*, pending more material.

Subspecific variation:—No traits vary within species, nor is there any geographic discontinuity.