

Leaves irregularly pinnate (sometimes with 1-veined pinnae present), not plicate; rachis 40.0(13.0–59.0) cm long; pinnae 4(2–12) per side of rachis; basal pinna 7.5(1.9–22.0) cm wide, forming an angle of 40(20–60)° with the rachis. *Inflorescences* rachillae 18(5–39).

**Distribution and habitat:**—From 1°55'–8°34'N and 57°52'–62°55'W in Guyana and adjacent Venezuela and Brazil at 337(35–900) m elevation in lowland rainforest in a variety of habitats, including flooded and non-flooded areas (Fig. 25).

A specimen from Guyana (*McDowell 4479*) has more pinnae than others and approaches subsp. *maxima* in its leaf morphology. Although subsp. *ambigua* has fewer pinnae per side of the rachis than subsp. *maxima*, it usually has a few, 1-veined pinnae present.

### 37c. *Geonoma maxima* subsp. *camptoneura* (Burret) Henderson, *comb. & stat. nov.*

Basionym: *Geonoma camptoneura* Burret (1931a: 201). Type: PERU. Loreto: Rio Huallaga, Yurimaguas, March 1930, L. Williams 7836 (holotype B, destroyed, isotype F!). [The type specimen appears to be a mixture, the leaf may belong to another species, possibly *G. deversa*].

Leaves undivided or irregularly pinnate (sometimes with 1-veined pinnae present), not plicate; rachis 51.9(38.0–70.0) cm long; pinnae 4(1–8) per side of rachis; basal pinna 8.5(2.0–20.0) cm wide, forming an angle of 31(15–40)° with the rachis. *Inflorescences* rachillae 23(14–38).

**Distribution and habitat:**—From 3°50'–13°45'S and 68°09'–78°22'W in the southwestern Amazon region of Peru and adjacent areas of Brazil and Bolivia at 334(135–800) m elevation in lowland rainforest (Fig. 25).

### 37d. *Geonoma maxima* subsp. *chelonura* (Spruce) Henderson, *comb. & stat. nov.*

Basionym: *Geonoma chelonura* Spruce (1871: 111). *Geonoma maxima* var. *chelonura* (Spruce) Henderson (1995: 279). Type: BRAZIL. Amazonas: Rio Uaupés, November 1852, R. Spruce 73 (holotype K!).

*Geonoma tuberculata* Spruce (1871: 112). *Geonoma spruceana* subsp. *intermedia* var. *tuberculata* Trail (1876: 329). Type: BRAZIL. Amazonas: Rio Negro, no date, R. Spruce 18 (holotype K!).

*Geonoma densiflora* Spruce (1871: 112). Type: BRAZIL. Amazonas: São Gabriel, near Gama's sitio, March 1852, R. Spruce 30 (holotype K!).

*Geonoma personata* Spruce (1871: 112). Type: BRAZIL. Amazonas: Serra of São Gabriel, June 1852, R. Spruce 34 (holotype K!).

*Geonoma densiflora* var. *monticola* Spruce (1871: 118). Type: BRAZIL. Amazonas: São Gabriel, June 1852, R. Spruce 33 (holotype K!).

*Geonoma spruceana* Trail (1876: 328). Type: BRAZIL. Pará: Lago Juruty, 3 April 1874, J. Trail 1002/XXIV (holotype K!, isotype BM!).

*Geonoma spruceana* subsp. *spruceana* var. *heptasticha* Trail (1876: 329). Type: BRAZIL. Amazonas: Rio Negro at Assutuba, 6 July 1874, J. Trail 1007/XCIII (holotype K!, isotype BM!).

*Geonoma spruceana* subsp. *intermedia* var. *major* Trail (1876: 330). Type: BRAZIL. Amazonas: Rio Solimões, Coary, 16 October 1874, J. Trail 984/CXLIV (holotype K!; isotypes BM!, NY!).

*Geonoma juruana* Dammer (1907: 119). Type: BRAZIL. Acre: Rio Juruá, Juruá-mirim, August 1901, E. Ule 5744 (holotype B, destroyed, isotypes F!, MG!).

*Geonoma longisecta* Burret (1930a: 257). Type: PERU. Loreto: Iquitos, 4 May 1925, G. Tessmann 5087 (holotype B, destroyed, isotype, NY!).

*Geonoma parvisecta* Burret (1930b: 1018). Type: BRAZIL. Amazonas: Rio Negro, São Pedro do Uaupés, 23 September 1928, P. Luetzelburg 22278 (holotype B, destroyed, isotypes M!, NY!).

Leaves undivided or irregularly pinnate (sometimes with 1-veined pinnae present), not plicate; rachis 24.7(7.3–63.0) cm long; pinnae 3(1–10) per side of rachis; basal pinna 4.3(0.2–20.0) cm wide, forming an angle of 44(10–87)° with the rachis. *Inflorescences* rachillae 15(4–36).

**Distribution and habitat:**—From 2°03'N–11°45'S and 55°00'–75°50'W in the central–western Amazon region of Venezuela, Colombia, Brazil, Peru, and Bolivia at 160(48–525) m elevation in lowland rainforest (Fig. 25).

This is the most variable subspecies with several local morphotypes.

Some specimens (*large fruit morphotype*) in the western part of the range in Peru and Colombia, especially from around Iquitos in Peru, have larger fruits (mean fruit length 14.0 mm, mean fruit diameter 11.0 mm) than those of other specimens (mean fruit length 11.0 mm, mean fruit diameter 8.2 mm).

Specimens (*parvisecta morphotype*) from scattered areas in Colombia, Venezuela, Peru, and Brazil, especially in the upper Rio Negro region, often in black water river areas on sandy soils (campina, catinga), are smaller than others and often have undivided leaves. The types of *Geonoma chelidonura* and *G. parvisecta* are of this morphotype.

Most specimens (e.g., *Henderson 1517, Trail 989, 991, 998, 1002, 1005, 1007*) (*intermediate morphotype*) from the eastern part of the range in Brazil, occurring in flooded areas near the main Amazon river (várzea), have 1-veined pinnae interspersed between the wider basal and apical pinnae, and in some cases resemble the sympatric subsp. *compta*.

A few specimens from widely scattered localities (*Balick 942, Gruezmacher 45, Kuhlmann 1237, Le Fiell 4, Moore 8428, Pipoly 15638, Prance 7596, Rimacht 10965, 11275, Rudas 3101*) (*densiflora morphotype*) in Peru, Colombia, Venezuela, and Brazil (including an unmapped specimen, *Kuhlmann 1237*, from "Tocantins", Pará) have thinner textured, sigmoid pinnae, few, thicker rachillae, and persistent pistillate flowers. The types of *G. densiflora*, *G. densiflora* var. *monticola*, and *G. personata* have these kinds of leaves and inflorescences. The specimens often occur sympatrically with subsp. *chelidonura* and subsp. *compta* and may be of hybrid origin.

### 37e. *Geonoma maxima* subsp. *compta* (Trail) Henderson, *comb. & stat. nov.*

Basionym: *Geonoma spruceana* subsp. *intermedia* var. *compta* Trail (1876: 329). Type: BRAZIL. Amazonas: Barcellos, 30 June 1874, *J. Trail 997/LXXXIV* (holotype K!).

*Geonoma spruceana* subsp. *intermedia* var. *intermedia* Trail (1876: 329). Type: BRAZIL. Amazonas: Lago Cerrado, Rio Jurua, 30 October 1874, *J. Trail 989/CXLVII* (holotype K!).

*Leaves* regularly pinnate with 1-veined pinnae, not plicate; rachis 44.5(11.0–87.0) cm long; pinnae 18(6–29) per side of rachis; basal pinna 0.3(0.1–0.5) cm wide, forming an angle of 58(38–77)° with the rachis. *Inflorescences* rachillae 19(4–40).

**Distribution and habitat:**—From 1°11'N–11°10'S and 56°00'–77°40'W in the central and western Amazon region in Colombia, Brazil, Peru, and Bolivia at 193(122–400) m elevation in lowland rainforest (Fig. 26).

Some specimens from the Colombian Amazon (e.g., *Galeano 1973, García-Barriga 15005, Zarucchi 1712*) have wider pinnae than the others, more like those of subsp. *hexasticha*. One specimen from Amazonas in Peru (*Díaz 713J*) appears intermediate between subsp. *compta* and subsp. *camptoneura*.

### 37f. *Geonoma maxima* subsp. *dispersa* Henderson, *subsp. nov.* (Appendix IV, Plates 46–48)

*A subspeciebus aliis prophyllis brevioribus differt.*

Type: COLOMBIA. Córdoba: Mun. Tierralta, entre los ríos Esmeraldas y Sinú, 2 km arriba de la confluencia, 200 m, 26 July 1986, *R. Bernal, G. Galeano & D. Restrepo 1148* (holotype, COL!).

*Leaves* irregularly pinnate (sometimes with 1-veined pinnae present), not plicate; rachis 53.0(34.0–80.0) cm long; pinnae 8(7–10) per side of rachis; basal pinna 4.7(2.0–7.5) cm wide, forming an angle of 49(41–60)° with the rachis. *Inflorescences* rachillae 21(12–36).

**Distribution and habitat:**—From 5°49'–7°45'N and 71°47'–77°30'W in the northern Chocó and Magdalena valley of Colombia and eastern Andean slopes in Venezuela at 245(15–700) m elevation in lowland rainforest (Fig. 26).

Leaves regularly pinnate with 3–5-veined pinnae (except for basal and apical ones), not plicate; rachis 77.9(49.5–120.0) cm long; pinnae 18(4–31) per side of rachis; basal pinna 0.7(0.2–2.5) cm wide, forming an angle of 57(34–80)° with the rachis. *Inflorescences* rachillae 31(9–50).

**Distribution and habitat:**—From 5°10'N–5°58'S and 46°30'–60°11'W in central and eastern Amazon region of Brazil, Suriname, French Guiana, with outliers in Guyana and Brazil at 288(50–700) m elevation in lowland rainforest (Fig. 25).

A specimen from French Guiana (*de Granville 16838*) differs from the others in its narrower pinnae. Another specimen from French Guiana (*de Granville 13389*) has only four pinnae per side of the rachis. Both these specimens approach subsp. *ambigua* in their leaf morphology. The geographically isolated specimens (*Henderson 649, 664, 1055, 1075, 1163, Moore 9534, Prance 2239*) from near Manaus in Brazil have longer rachis, more pinnae, and narrower apical pinnae with narrower angles. However, there are too few specimens to test these differences, and it is not clear if the gap between them and other specimens is an artifact caused by incomplete collecting.

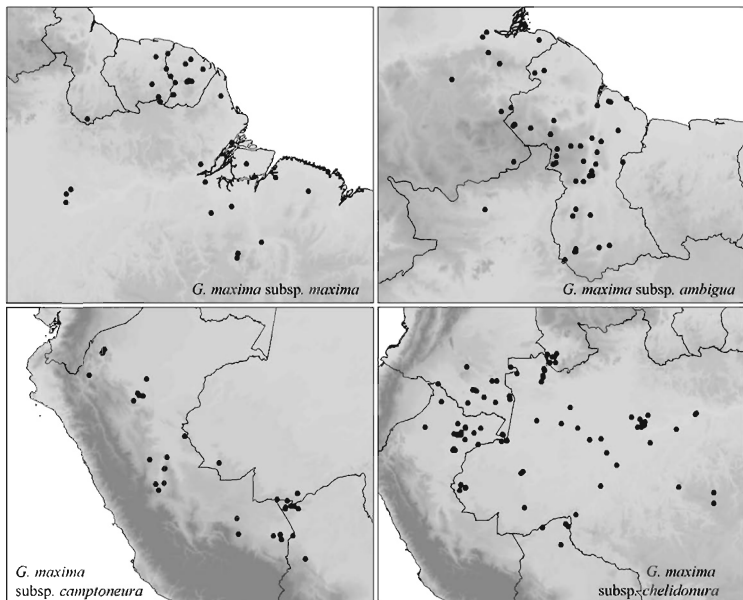


FIGURE 25. Distribution maps of *Geonoma maxima* subsp. *maxima*, *G. maxima* subsp. *ambigua*, *G. maxima* subsp. *camptoneura*, and *G. maxima* subsp. *chelidonura*.

**37b. *Geonoma maxima* subsp. *ambigua* (Spruce) Henderson, comb. & stat. nov.**

Basionym: *Geonoma ambigua* Spruce (1871: 111). *Geonoma maxima* var. *ambigua* (Spruce) Henderson (1995: 278).  
Type: GUYANA. Without locality, no date, *C. Appun 566* (holotype K!).

*Geonoma schomburgkiana* Spruce (1871: 111). Type: GUYANA. Without locality, 1837, *R. Schomburgk 705* (holotype K!, excluding leaf).