

petioles, more pinnae, wider basal pinna angles, and shorter apical length. About half the specimens have pinnate leaves, which accounts for their wider basal pinna angles. This morphotype also occurs at lower mean elevations than the *fortuna* morphotype (888 versus 1140) m.

At the eastern end of the Central Cordillera at El Copé and the Coclecito Road (*elcope* morphotype) there is a morphotype with smaller, pinnate leaves and a slender, short rachilla. Specimens differ from Santa Fé ones in nine variables, particularly in their smaller leaves.

At El Valle and El Copé (*elvalle* morphotype) there is a morphotype with larger, undivided or pinnate leaves with pronounced adaxial veins and long, stout rachillae.

Specimens from Río Guanche, Santa Rita Ridge, Cerro Bruja, and Serranía de San Blás (*guanche* morphotype) are particularly variable, especially in rachilla size. They have undivided or pinnate leaves with pronounced adaxial veins. Some specimens have leaves which dry a gray-green color.

Some specimens from the Serranía de San Blás (*sanblas* morphotype) have small, usually undivided leaves with raised veins and small inflorescences.

In northwestern Colombia and just reaching eastern Panama, with an outlier on the Sierra Nevada de Santa Marta there is a morphotype (*cuneatoidea* morphotype) with large, undivided leaves or with 2–8 pinnae per side with pronounced raised veins and large inflorescences. The type of *G. cuneatoidea* is of this morphotype.

In the northern half of the Chocó region, and extending into eastern Panama, the Magdalena valley, the Central and Western Cordilleras, and western Venezuela is a morphotype (*choco* morphotype) with leaves with 3–7 pinnae per side, rarely undivided, and raised adaxial veins. Two specimens (*Bernal 2174*, *Juncosa 1228*) from this area are unplaced. They are similar to subsp. *indivisa* except they have orange-brown petioles and rachis.

Stauffer (1998) reported that *G. cuneata* occurred in Apure, Venezuela. The specimens cited by Stauffer have not been seen, but another specimen from the same locality is here determined as *G. brongniartii*. *Geonoma cuneata* does, however occur in Zulia, Venezuela in its *cuneatoidea* morphotype.

In northwestern Colombia, southwestern Colombia, and northwestern Ecuador (*multi-pinnate* morphotype), there is a pinnate leaved morphotype with 6–35 pinnae per side of the rachis, raised adaxial veins, and large inflorescences. There is no significant difference in any variable between the two areas where this morphotype occurs.

In western Ecuador (Esmeraldas) and extreme southwestern Colombia (*esmeraldas* morphotype) at low elevations (50–350 m), a few specimens, have small, undivided leaves with raised adaxial veins.

In western Ecuador and just reaching southwestern Colombia (*ecuador* morphotype) at higher elevations (200–1375 m) there is a morphotype with large, undivided or divided leaves with 2–6 pinnae per side of the rachis and prominent raised adaxial veins. This morphotype differs from the similar *cuneatoidea* morphotype in its narrower rachis and shorter rachillae. The specimen from the most southerly location (*Jativa 231*) is smaller than the others.

14b. *Geonoma cuneata* subsp. *guanacastensis* Henderson, subsp. nov. (Appendix IV, Plate 16)

A subspectebus aliis petiollis in sicco brunneo-aurantiactis differt.

Type: COSTA RICA. Guanacaste/Alajuela: slopes of Miravalles, above Bijagua, ca. 1500 m, November 1982, L. Gómez et al. 19053 (holotype NY!, isotype MO!).

Leaves undivided; petioles drying orange-brown; veins not raised or slightly raised and triangular in cross-section adaxially; rachis 27.6(17.7–31.5) cm long; pinnae 1 per side of rachis. *Inflorescences* staminate flowers deciduous after anthesis; non-fertilized pistillate flowers deciduous after anthesis.

Distribution and habitat:—From 10°35'N–10°59'N and 84°55'–85°27'W in Costa Rica (Cordilleras de Guanacaste and Tilarán) at 814(470–1500) m elevation in lowland or montane rainforest (Fig. 13).

Key to the subspecies of *G. congesta*

- 1 Rachillae 11.9(6.0–21.5) cm long; Honduras, Nicaragua, Costa Rica (excluding Osa Peninsula and adjacent areas), and western and central Panamasubsp. *congesta*
 - Rachillae 19.1(15.0–23.0) cm long; Osa Peninsula and adjacent areas on the Pacific slope in Costa Rica subsp. *osensis*

13a. *Geonoma congesta* subsp. *congesta*

Inflorescences rachillae 11.9(6.0–21.5) cm long.

Distribution and habitat:—From 8°30'–15°42'N and 79°45'–85°34'W in Central America in Honduras, Nicaragua, Costa Rica, and western and central Panama as far east as the Canal Zone at 255(25–1000) m elevation in lowland tropical rainforest (Fig. 13).

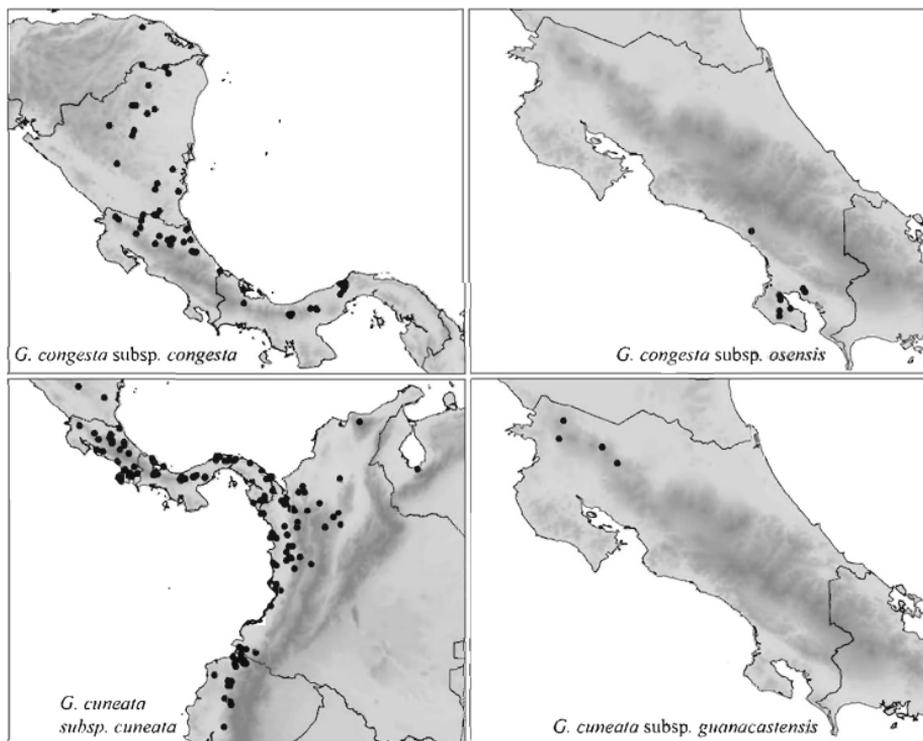


FIGURE 13. Distribution maps of *Geonoma congesta* subsp. *congesta*, *G. congesta* subsp. *osensis*, *G. cuneata* subsp. *cuneata*, *G. cuneata* subsp. *guanacastensis*.

13b. *Geonoma congesta* subsp. *osensis* Henderson, *subsp. nov.* (Appendix IV, Plates 10–15)

A *Geonoma congesta* subsp. *congesta* rachillis longioribus differt.

Type: COSTA RICA. Puntarenas: Esquinas Forest Preserve between Palmar Sur and Golfito on United Fruit Company railroad, 9 March 1953, *H. Moore 6534* (holotype NY!, isotype BH!).