

inequilateral leaflets that are clearly denticulate in the upper half of both margins. In the open in direct sun, or as an understorey in secondary vegetation, the leaflets often become narrower and quite coriaceous with entire margins, but in more shaded conditions the leaflets are wider, thinner and show well-developed serrations in the upper third. Plants growing in extremely dry, sandy soil were described as *Z. jirijirimensis*.

SYSTEMATIC AND NOMENCLATURAL HISTORY Ducke (1915) described *Zamia lecointei* and mentioned another probable new *Zamia*, which he described as *Z. cupatiensis* in 1922. The type, illustration (Ducke, 1915, tabula 1) and description of *Z. lecointei* all show linear-lanceolate leaflets. Ducke's (1915) concept of *Z. ulei* is presented in tabula 2 of the same paper; this bears little resemblance to the type or description (Dammer, 1907) of *Z. ulei* Dammer, which has ovate-lanceolate to elliptic leaflets. As a result of his misconception, Ducke (1922) described *Z. cupatiensis* Ducke. The description and photograph of *Z. cupatiensis* (Ducke 1922, tabula 2) match the photograph and isotypes of *Z. ulei*. In the same paper, Ducke (1922) also described *Z. obidensis* Ducke which was intermediate between his *Z. lecointei* and his *Z. cupatiensis*. Because Ducke mistakenly thought that *Z. ulei* had linear-lanceolate leaflets, he (Ducke, 1935) considered *Z. lecointei* to be a subspecies, *Z. ulei* subsp. *lecointei*. This problem was compounded by Schuster (1932). As a result, Schultes (1953) redescribed *Z. lecointei* as *Z. jirijirimensis*. However, the type specimens for these two names are identical. Thus, *Z. cupatiensis* is a synonym of *Z. ulei*, and *Z. jirijirimensis* is a synonym of *Z. lecointei*. Moreover, *Z. obidensis* is a shade and/or juvenile form of *Z. lecointei*.

CONSERVATION STATUS *Zamia lecointei* is most common in Bolivar, Venezuela, in both pristine and disturbed habitats. Seed set appears high and the populations are not at present threatened by development or destruction. Collections in Colombia indicate that it is locally common with good seed set. It does well in minor disturbed situations. However, because *Z. lecointei* is known from only a single collection from Peru, it is assumed that the species is very rare in Peru and does not occur in either Ecuador or Bolivia even though suitable habitat does occur in the latter two countries. Not listed in the 1997 IUCN Red List of Threatened Plants but the status throughout its range would be R, II, R.

7. *ZAMIA MACROCHIERA* D.W. Stevenson, species nova (Fig. 14.7)

TYPE: PERU. LORETO: Maynas, Pebas, Rio Amiyacu, *D. Stevenson 1160* (HOLOTYPE: NY; ISOTYPES: AMAZ, FTG, NY, U)

Zamia manicata Regel praesertim collo glanduliformi ad foliolorum basi sito oblongo-elliptico e basi cuneato spiraliter adscendenti ultra medium serrato, distaliter concavo inter alia diversa.

Stem subterranean, subcylindric to cylindric, 10-20 cm in diameter. *Cataphylls* triangular basally, long acuminate apically, 3-8 cm long, 1-2 cm wide. *Leaves* 1-3,

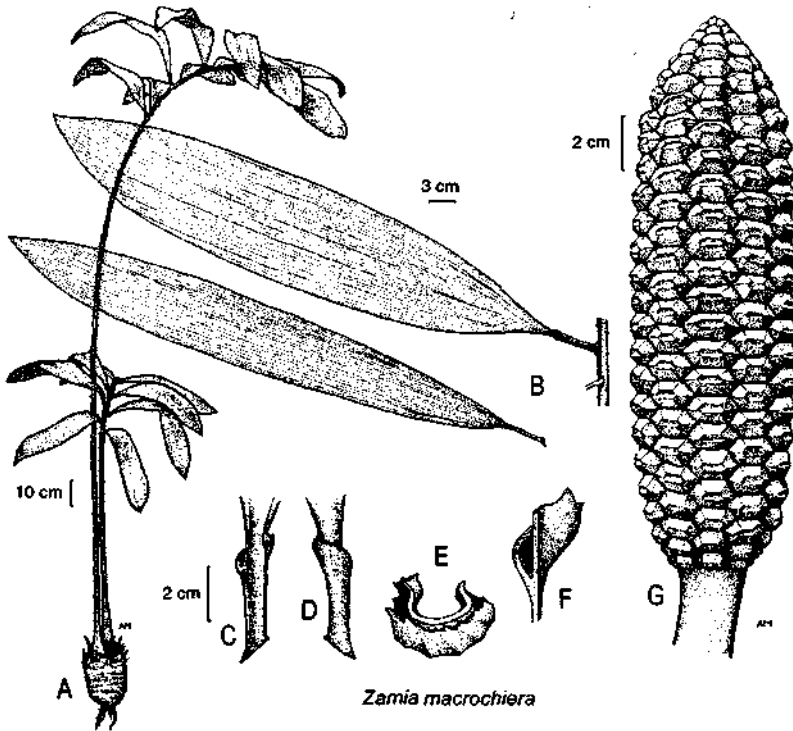


Fig. 14.7. *Zamia macrochiera* D.W. Stevenson. (A) Habit. (B) Leaflets. Gland-like structure at the juncture of petiole and lamina: (C) adaxial view, (D) abaxial view, (E) apical view and (F) basal view. (G) Ovulate strobilus.

0.5–3.5 m long; petiole 0.2–2 m long, slightly to densely prickled; rachis often with prickles in lower third, with 10–30 pairs of leaflets. *Leaflets* with distinct petiole and abaxial gland-like collar or flap that curves upward to touch the lamina forming a tunnel at the juncture, oblong to long-elliptic, margins serrate in upper third, cuneate basally, acute to acuminate apically, the larger median leaflets 20–45 cm long, 5–15 cm wide. *Pollen strobili* cream to tan, cylindrical, 4–6 cm long, 1–1.5 cm in diameter; peduncle 15–30 cm long. *Ovulate strobili* wine-red to dark red-brown, cylindrical to ovoid-cylindrical, 10–15 cm long, 4–7 cm in diameter. *Seeds* red, 1–1.5 cm long, 0.5–0.8 cm in diameter. $2n = 18$ (Aldo Moretti, Italy, 1993, personal communication).

DISTRIBUTION *Zamia macrochiera* occurs in rainforest and secondary forest from 100 m to 300 m in a limited area of Peru (Fig. 14.2).

PARATYPES: PERU. LORETO: Maynas, Rio Napo, *M. Mathias s.n.* (MO, NY); Pebas, *T. Plowman et al.* 6937 (F, GH), 7254 (F, GH, K, NY, U), 7275 (F, GH, K).

ETYMOLOGY The specific epithet refers to the large gland-like collar at the leaflet base.

DISTINGUISHING FEATURES The petiolule and gland-like collar occur among cycads only in *Zamia manicata* Linden ex Regel (Stevenson, 1990, 2001) and *Z. macrochiera*. However, these structures are not present in seedling leaves, are only diminutively present in juvenile leaves but become distinct in adult leaves of both species. Also, in transplanted adult plants, the structures may not be produced in the first set of leaves after transplanting. The most obvious difference between the two species is in the morphology of the gland-like collar. The collar in *Z. manicata* is a rim-like structure, in contrast to that of *Z. macrochiera* where it is a well-developed flap of tissue that curves up to meet the lamina forming a tunnel (Fig. 14.7). In addition, both the leaves and ovulate strobili of *Z. macrochiera* are much larger than those of *Z. manicata*. This is the undescribed species discussed by Wrinkle (1993).

CONSERVATION STATUS *Zamia macrochiera* has been collected only four times in the past 25 years and all collections have been near the type locality. Although some seedlings were seen at the type locality, only one seed cone has been observed. However, the species appears to be threatened by continual habitat disturbance. The type locality was being converted from secondary forest into a communal garden. Not yet listed in the 1997 IUCN Red List of Threatened Plants.

8. ZAMIA POEPPIGIANA Martius & Eichler, (1863) Flora Brasiliensis 4(1), 414-116 and Tabula 109

TYPE: PERU. Maynas Alto, Toache River, 1830, *Poeppig s.n.* (LECTOTYPE: F ex Herbario Musei Palatino Vindobensis; ISOLECTOTYPE: GH ex Herbario Musei Palatino Vindobensis; *vide* Stevenson and Sabato, 1986).

Z. lindenii Regel ex André, (1875) *L'illustration Horticole* 22, 23 and Planche 195. **LEGTOTYPE:** Planche 195 in *L'illustration Horticole* 23, (1875) (*vide* Stevenson and Sabato, 1986).

Aulacophyllum lindenii (Regel ex André) Regel, (1876) *Gartenflora* 25, 141.

Z. baraquiniana Regel, (1876) *Acti Horti Petropolitani* 4(4), 308-309.

TYPE: ex Horto Petropolitano, *Regel s.n.* (HOLOTYPE: LE).

Z. wielandii Schuster, (1932) *Das Pflanzenreich* IV.1, Heft 99, 149, *nomen illegitimum*, superfluous name for *Z. baraquiniana* Regel.

Stem arborescent, to 3 m tall and 25 cm in diameter. *Cataphylls* cuneate basally and acuminate apically, to 2 cm wide and 4 cm long. *Leaves* 10–15, 1–3 m long; petiole with numerous small prickles, 30–70 cm long; rachis with prickles in lower third, 20-40 pairs of leaflets. *Leaflets* long-lanceolate, falcate basally, acuminate to acute apically, margins strongly spinulose in upper third with serrations at nearly 90° and 0.5-1 cm apart; median leaflets 15-40 cm long, 2–4 cm wide.