Gearum (*Araceae*) rediscovered

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Summary. The rediscovery of the monospecific Brazilian genus *Gearum* by Alfeu de Araujo Dias is recorded and the hitherto unknown leaf described. The new collection is from the Brazilian state of Mato Grosso. Examination of the new inflorescence specimen confirms the accuracy of N. E. Brown's original description. A new description of the pollen is given.

Gearum brasiliense N. E. Brown, has hitherto been known only from a single inflorescence, collected in October 1828 by W. J. Burchell. Knowledge of the genus has thus been incomplete, particularly due to lack of leaf material. Burchell's specimen is substantially damaged by insect attack and very fragile. Despite this handicap, the present study has shown that Brown's original description was remarkably accurate.

The precise location of Burchell's collection remained unclear until now. Burchell's field notebook in the Kew Archive (K) gives the following details:- "between Sapé and Santa Brizida (Serra Sta. Brizida) on the plains in low lying places that are often inundated (River from the ferry)". The locality names Sapé and Santa Brizida, given by Burchell, could not be traced for this region in the gazeteers examined. However, the adjacent localities given in Burchell's notebook suggest that the plant must have been collected somewhere in the valley of the Rio da Palma, between Conceição do Norte (also called Conceição do Tocantins) and Arraias, in the modern state of Tocantins (previously the northern part of Goiás). There is today a village called Sapo in this area which could be the same as Burchell's "Sapé" and Burchell himself mentions the Rio da Palma, a tributary of the Rio Paranã, which is in turn a tributary of the Rio Tocantins. The coordinates given by Smith & Smith (1967) are approximately 75 km (air distance) too far east.

Not long after collecting the type of *G. brasiliense*, Burchell made another *Araceae* collection further north along the Rio Tocantins, this time of leaves only (*Burchell* 8598 (K!)). In the absence of a second collection of *Gearum*, there has always been doubt as to whether these pedatisect leaves are of the same species. Their identity remains unsolved, but they must be of a species of *Xanthosoma* sect. *Acontias*. The only other possibility, suggested by Brown himself, is that they are of a species of *Chlorospatha*. This genus, however, has never been recorded from Brazil.

A second, more complete collection of *Gearum brasiliense* has been made after 150 years by Alfeu de Araujo Dias, a botanist who worked for the Brazilian national resources survey, Projeto RADAMBRASIL. Specimens seen at the

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IBGE herbarium in Salvador (HRB) and at the Jardim Botanico do Rio de Janeiro (RB) had been identified originally as *Xanthosoma cf. pentaphyllum*. Dias found the plant just within the state of Mato Grosso, near the Rio Araguaia which forms the border with Goiás. From the coordinates given on the specimen label, the nearest town of any importance appears to be São Miguel do Araguaia (Goiás). The habitat is apparently similar to that of Burchell's plant. The Rio Araguaia is adjacent to the basin of the Rio Tocantins, whence comes the type collection.

Dias's collection includes, for the first time, material of the leaf, which shows it to be clearly different from *Burchell* 8598. The folding of the leaf lobes in the specimen makes it difficult to see the form precisely, but our interpretation is that the leaf is subpalmately lobed, with three well-developed central lobes and two weaker and more slender basal lobes. The major venation lacks the well-developed basal ribs which are typical of pedate vein patterns. The leaf of *Gearum* thus appears to be a foreshortened variation of the pinnatisect form found in *Gorgonidium*.

The structure of the male and female flowers and the rather large, ellipsoid pollen grains confirm that *Gearum* belongs to tribe *Spathicarpeae* (Engler 1920, Grayum 1990, Bogner & Nicolson 1991, Grayum 1992: 26). The genus is distinguished within the tribe by the zone of sterile flowers between the male and female zones of the spadix, the almost smooth pollen exine and the subpalmately lobed leaf.

Bogner & Nicolson (1988) suggested that *Gearum* was probably most closely related to the genus *Gorgonidium*. This still seems likely, though the most important similarity remains the orthotropous ovules with a short funicle. The leaf form of *Gearum*, though clearly not pinnatifid as in *Gorgonidium*, is quite similar to juvenile forms of the latter (e.g. see Bogner & Nicolson 1988, Fig. 26).

Gearum brasiliense *N. E. Brown* in J. Bot. 20: 196–197, t. 231, f.I. 1–9 (1882). Type: Brazil, Tocantins (previously Goiás), between Sapé and Santa Brizida, *W. J. Burchell* 8111 (holotype K!).

Vernacular name: "cobreiro"

Tuberous herb with aromatic exudate when cut. Leaf solitary. Petiole 14–18 cm long and 3–4 mm in diam.; sheath 9–10 cm long, distinct, c. 1 cm wide, rounded at apex; geniculum absent. Leaf blade subpalmate with 5 lobes, the 3 central lobes broader than the basal ones, fine venation reticulate; central lobe elliptic, c. 10 × 4·5 cm, apex cuspidate, primate lateral veins 8–11 per side, forming inframarginal collecting vein c. 2 mm from margin, sinuses separating central and lateral lobes rounded distally and extending to within c. 1 cm of the midrib; lateral lobes elliptic, c. 9 × 3·3 cm, cuspidate, with 5–6 primary lateral veins per side; basal lobes much narrower, sublinear, tapering apically, c. 5 × 1 cm; midvein of all lobes well-developed, to 2 mm thick at base of central lobe. Inflorescence solitary, appearing before or with the leaf. Peduncle very short, c. 1·5 cm long (up to 6 cm sec. Brown), c. 0·4 cm diam. Spathe purplish, 17 cm (15 cm sec. Brown) long, very slightly constricted centrally, tube subcylindric, convolute, c. 4–5 cm long, c. 2·5 cm diam., blade erect, c. 12·5 cm long, gaping

FIG. 1. *Gearum brasiliense*. **A** inflorescence × (1/3); **B** spadix × ⅔; **C** female flower with staminode side view × 8; **D** female flower longitudinal section × 8; **E** male flower top view × 8; **F** male flower side view × 8; **G** leaf × ⅓. **A-G** from *Burchell* 8111 & *Araujo Dias* 41. Drawn by Eleanor Catherine.

and c. 4·5 cm wide when open, apex cuspidate. Spadix shorter than spathe, white, fertile to apex, free from spathe, c. 13 cm long, female zone c. 2 cm long, c. 1·8 cm diam., male zone c. 9 cm long, c. 1 cm diam. in middle, subcylindric and tapering to apex, male and female zones separated by a narrower zone of synandrodes (sterile male flowers) c. 1 cm long, 0·5 cm diam. Flowers unisexual, without perigon, densely arranged. Male flower: 4-androus, stamens connate into a subrhombic, shallow, truncate synandrium 3–4 × c. 2 mm, uppermost synandria shorter, c. 2 × 1·5 mm, border between connate stamens marked by minute groove on upper surface of synandrium, thecae almost always 8, globose to ellipsoid, laterally situated and extending to margin of synandrium, 0·5–0·65 mm diam., dehiscing by apical pore or occasionally by oblique slit, pore 0·25–0·3 mm diam. Pollen grains inaperturate, ellipsoid, 52–60 μm × 43–49 μm, exine smooth to scabrous. Sterile flowers: synandrodes irregularly elongate,

shallowly truncate, 2·5–3·5 × 0·8–1 mm. Female flower: ovaries intermixed with staminodes; staminodes laterally flattened, thick, ± obovoid, c. 2 mm wide, usually 4 (rarely 3 or 5) per gynoecium; ovary depressed globose, c. 1·5 mm tall, c. 3 mm diam., 3–4-locular, locules 1-ovulate, ovule orthotropous, elongate, funicle short, placenta axile at base of septum, stigma sessile to subsessile, shallowly (3–)4-lobed, c. 2 mm diam., darker coloured in herbarium material. (Fig. 1).

DISTRIBUTION. Brazil, in the states of Tocantins and Mato Grosso.

HABITAT. Campo cerrado and low-lying areas prone to seasonal riverine flooding.

MATERIAL SEEN. BRAZIL. Mato Grosso: Rio Araguaia, 'loc. 27', 13°22'S, 50°40'W, 31 Oct. 1978, *Alfeu de Araujo Dias* 41 (HRB!, RB!). Tocantins (previously Goiás): Serra Sta. Brizida, between Sapé (probably modern Sapo) and Santa Brizida, 15 Oct. 1828, *W. J. Burchell* 8111 (holotype K!).

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