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STUDIES IN THE FLORA OF ARABIA XXI: Cibirhiza, a new genus of Asclepiadaceae from Oman

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ABSTRACT. *Cibirhiza dhofarensis* gen. et sp. nov. (Asclepiadaceae) is described from the Sultanate of Oman. It is endemic to the Dhofar province, occurring in the wettest parts of the escarpment mountains and coastal plain, where it is used locally as a food plant. Its position within the Asclepiadaceae is discussed but remains uncertain.

The coastal mountains of the Dhofar Province of Oman have a high rainfall in contrast to that sustaining the desertic hinterland. The seasonal nature of this rainfall, the moderating influence of the sea on temperatures and the rocky terrain have combined to produce a vegetation much richer than that in any other part of the eastern side of the Arabian Peninsula. However, it appears that the level of endemism is not especially high and, particularly in the Asclepiadaceae, virtually all the species now known from Oman (excepting *Caralluma aucheriana*, *Raphionacme arabica* and *Rhytidocaulon fulleri*) are also found further west in the Hadramawt, the Jebel Ureys or other parts of South Yemen and further to the north-west in North Yemen. Although the genus herein described appears to be endemic to Dhofar and therefore an exception to this, much of South Yemen is so little-known botanically that its occurrence there cannot be discounted.

Cibirhiza dhofarensis Bruyns, **gen. et sp. nov.** Fig. 1.

Asclepiadacearum (Marsdenieae) a *Anisopo* N.E. Br., antheris horizontalibus sine appendiculis, a *Oncostemma* K. Schum. corona interiore dissimili, inflorescentia magis simplici et omnibus ceteris generibus coronis interioribus exterioribusque bene evolutis differt. A tribu Stapelieae membrana columna staminali tegente et pollinio carenti marginem pellucidum discedit.

Species typica et unica: *Cibirhiza dhofarensis* Bruyns *sp. nov.*

Type: Sultanate of Oman, Dhofar Province, cliff tops of Ras Hamar, 15km W of Salalah, degraded woodland dominated by *Commiphora* spp., *Blepharispermum hirtum* and *Euphorbia jatrophoides*, 80m, 8 ix 1985, *A.G. Miller* 7525 (holo. E; iso. K, KWT, MUSCAT, OXF, UPS).

Rootstock a brown, woody, elongated, turnip-shaped tuber with fibrous roots from base, up to and exceeding 15cm diam. *Stems* with milky sap, prostrate to twining, up to 150cm long, becoming woody, with light brown bark. *Leaves* bright to dull green, opposite, ovate to oblong-ovate, 4–15cm long, 1·5–10cm broad, tip obtuse or rounded, margin entire, base truncate to cordate, densely pubescent below, thinly pubescent above, petiole 1–7cm long, thinly pubescent, grooved above. *Flowers* in falsely axillary clusters of 15–25. *Pedicel* 2–3mm long, pilose. *Sepals* linear-subulate, 2·5–3mm long, 0·5–0·8mm broad at base, pilose. *Corolla* rotate, 12–14mm diam., exterior pilose, pale green, interior puberulous with dense

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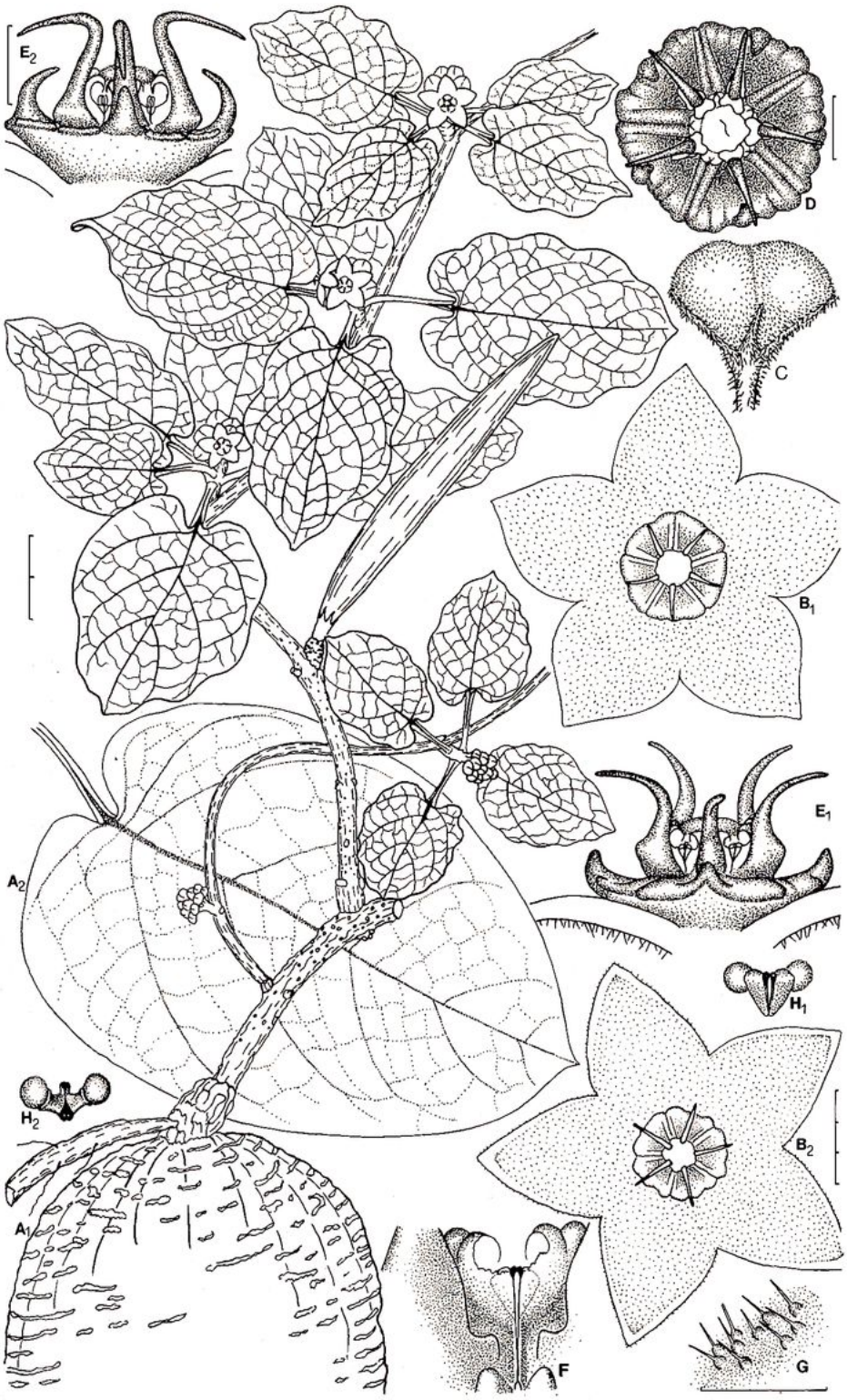

FIG. 1. *Cibirhiza dhofarensis*. A_1, plant showing upper part of large basal tuber and new tuber developing from it; behind is another much larger leaf (A_2) drawn to the same scale; B, face view of corolla; C, bud; D, face view of staminal corona and column with covering membrane removed; E, side view of staminal corona and column with covering membrane removed; F, detailed view of guide rail-anther organization; removal of membrane does not expose pollinia to view from side; dotted lines indicate caudicles of pollinaria faintly visible through intervening tissue; G, spine-tipped papillae on inner surface of corolla; H, pollinarium: H_1 viewed from outside, H_2 from above. Scales: A = 2cm; B–C = 3mm; D–E = 1mm; F–H = 0·5mm. A_1, B_1, D, E_1, F–H drawn from *Miller* 7525; A_2, B_2, E_2 from *Miller* 7592 (E).

covering of minute dark purple spots on green background except near margins; *tube* more or less lacking; *lobes* ovate-deltoid, 4–5mm long, 4–4·5mm broad at base. *Corona* c.3mm diam., white; *outer lobes* united into pentagonal disc adpressed to surface of corolla, each lobe with upward- or inward-pointing tooth in middle near its margin, lobes demarked by deep groove running from margin towards centre of flower, depressed towards middle; *inner lobes* at first erect with dorsal thickening and adpressed to backs of anthers, then cylindrical and recurved away from centre of column, 1·25–1·5mm long. Stigmatic surface covered with thin membrane covering the short, grooved, rectangular anthers. *Pollinia* solitary in each anther-theca, horizontal, ovoid, c.0·15mm diam. *Follicle* linear-ovoid, c.7 × 1cm, tip acuminate, only one of pair developing.
SULTANATE OF OMAN. Dhofar: Ras Hamar, scrub-covered slopes with *Commiphora* spp. and *Adenium obesum,* 100m, 30 vii 1985, *Miller* 7179 (E); Ayn Jarsis waterhole, N of Salalah, wet woodland with *Anogeissus, Blepharispermum, Croton confertus* etc., 80m, 7 ix 1985, *Miller* 7504 (E, MUSCAT, K); Coastal plain, wadi 14km E of Taqah, rocky slopes, 30m, 2 x 1979, *Miller* 2439 (E); Wadi Hinna, escarpment woodland with *Delonix, Commiphora* spp., *Anogeissus, Acacia* spp., etc, 250m, 11 ix 1985, *Miller* 7592 (K, MUSCAT); J. Qara, c.15km SE of Jibjat, dry rocky wadi with *Anogeissus, Commiphora* scrub, 900m, 30 ix 1979, *Miller* 2381 (E).

This new genus is endemic to the Dhofar Province of Oman, being known only from the wettest part of the escarpment mountains and the coastal plain. The plants occur there in considerable numbers, growing on the tops of cliffs, wadi sides and rocky slopes between 50 and 900m above sea-level, generally with the tubers growing in cracks in rocks. Plants scramble along the ground or occasionally twine to a length of 1·5m and arise from a hard, brown tuber which may reach a considerable size. This tuber is eagerly sought after and eaten by the local inhabitants. Other parts of the plant are also eaten (including fruits, leaves and flowers). The Jabah name for the plant is 'sefot'.

The placing of *Cibirhiza* among the tribes of the Asclepiadaceae is not easy. The very well-developed outer coronal disc and conspicuous horns of the inner corona suggest at first glance that it belongs to the Stapelieae. However, at anthesis the top of the column is covered with a thin membrane and the pollinia lack the characteristic pellucid inner or apical margin of this tribe. The development of only one of a pair of follicles is also not typical of the Stapelieae, nor is the white sap contained in the stems. The pollinia are held horizontally in the anther-thecae and, despite the unusually large size of the caudicles and the lack of an appendage on each anther, it would appear that *Cibirhiza* belongs to the Marsdenieae.

In *Cibirhiza* both the outer and inner coronas are well developed, which suggests that the genus is allied to either *Anisopus* N.E. Br. or *Oncostemma* K. Schum. However, the latter has a remarkable inner corona and a more complex inflorescence structure, while the former has erect anthers with membraneous appendages and the inflorescences are axillary, arising from both pairs of opposite axils. In fact an examination of herbarium material shows that this genus is unlike any other in the Marsdenieae and either occupies an isolated position within this tribe or, like *Tylophora* R. Br., possibly fits into none of the tribes comfortably, having some characters of the Marsdenieae and some of the Stapelieae.

The leaves of *C. dhofarensis* are extremely variable in size as Fig. 1 A_1 and A_2 (drawn to the same scale) show. However, they also vary very much in shape—sometimes longer than broad but sometimes vice versa—in the amount to which the margins are undulated and, more significantly perhaps, in colour and texture. Some of them have a rather shiny green colour with very sparsely hairy upper surface while others have a duller green upper surface with more densely placed hairs.

The top of the column is covered by a very thin membrane which seems to extend down the sides between the inner corona-lobes leaving only a long slit exposing the translator and, below this, the guide rails. The part of the membrane around the top of the translator has an indentation in it exposing the upper brown part of the translator. This membrane can be removed from the top of the column (but not from the sides) and this leaves the anthers, pollinaria and stigmatic surface exposed as in Fig. 1D–F. When this has been done the pollinia are still not visible from the side and only the translator and a small portion of the caudicles can be seen. The remainder of the caudicles is visible as a dark area behind the membrane. The view from above is not much better until the pollinarium is removed, for the pollinia are concealed within the anther-thecae. Each pollinium is extremely small and is attached on the end of the relatively heavy caudicle. Tissue of the translator seems to cross the top of the pollinarium with a small, hard, brown structure on the side nearest to the stigmatic surface.

Note: The Herbarium at The Natural History Museum, P.O. Box 668, Muscat, Sultanate of Oman, cited as MUSCAT above, has been designated the herbarium code ON for the forthcoming, 8th edition, of *Index Herbariorum*.