

A NEW GENUS OF ZINGIBERACEAE FROM S INDIA

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ABSTRACT. A new monotypic genus of Zingiberaceae-Hedychieae, *Paracautleya* R. M. Smith, is described from S India; based on the recently collected *P. bhatii* R. M. Smith, its generic affinities appear to lie with the Sino-Himalayan *Cautleya* and *Roscoea* rather than the widespread *Curcuma*.

In 1975 a small but extremely interesting member of the Zingiberaceae, collected from South Kanara by Mr Gopalakrishna Bhat of Poornaprajna College, Udupi, was sent to Edinburgh for identification. South Kanara lies on the western seaboard of peninsular India and is bounded on the east by the watershed of the Western Ghats; it is an area of extremely high rainfall and Mr Bhat reports that the new ginger grows in rock crevices and flowers during the monsoon months of July and August.

There is a small group of genera in Zingiberaceae-Hedychieae characterized by having a truly versatile anther, the bases of the thecae usually prolonged into short sterile spurs. It is to this group that the Kanaran plant belongs. The known genera are: *Curcuma*, which is wide-ranging and also occurs in the Western Ghats; and the geographically remote *Camptandra*, *Cautleya* and *Roscoea*. The anther character is probably constant throughout these genera, but the new plant is further distinguished by the basal attachment of the ovules and cannot be happily assigned to any of them. It is described below as a new genus, *Paracautleya*, and the following conspectus of the genera with versatile anthers brings out the salient differential features.

PARACAUTLEYA R. M. Smith. Inflorescence arising in the centre of a leaf tuft. Primary bracts free from each other, each subtending a single ebracteolate flower. Epigynous glands present. Ovary imperfectly trilocular, the ovules arising at the base. S India.

CURCUMA Linn. Inflorescence arising in the centre of a leaf tuft or laterally to the leaf tuft. Primary bracts adnate to each other, at least at their bases (the lowermost occasionally free), forming pouches, each enclosing a cincinnus of bracteolate flowers. Epigynous glands present. Ovary trilocular with axile placentation. India to Australia and the Pacific, widely cultivated.

CAUTLEYA Royle & **ROSCOEIA** Sm. Inflorescence terminal on a leafy stem. Primary bracts free from each other, each subtending a single ebracteolate flower. Epigynous glands present. Ovary trilocular with axile placentation. Sino-Himalayan.

CAMPTANDRA Ridl. Inflorescence terminal on a leafy stem, consisting of a single (rarely 2) large, concave primary bract which encloses a cincinnus of bracteolate flowers. Epigynous glands absent. Ovary trilocular with axile placentation. Malaysia.

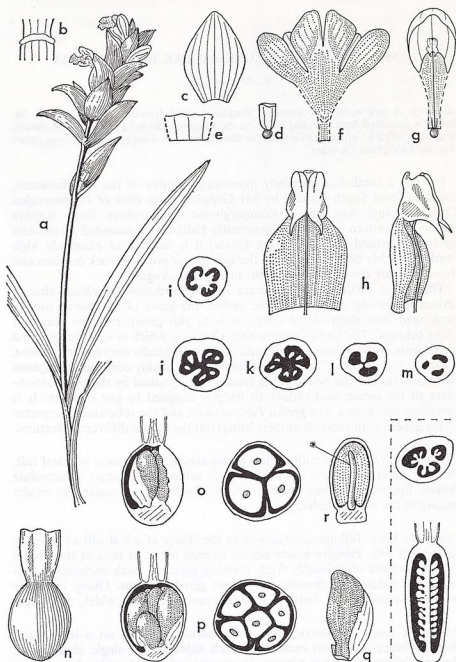


FIG. 1. *Paracautleya bhatii* R. M. Smith: a, habit $\times 1$; b, ligule $\times 2$; c, bract $\times 2$; d, calyx $\times 2$; e, calyx, dissected $\times 2$; f, g, flower dissected $\times 2$; h, stamen from front and side $\times 9$; i-m, ovary in T.S., base to apex $\times 9$; n, capsule $\times 4$; o, 3-seeded capsule in L.S. and T.S. $\times 4$; p, 6-seeded capsule in L.S. and T.S. $\times 4$; q, seed $\times 6$; r, seed in L.S. $\times 9$ (* indicating embryo). Inset: Ovary of *Cautleya spicata* in T.S. and L.S. $\times 3$.

When considering the possible affinities of *Paracautleya* the very distinctive *Camptandra*, known only from Borneo and the Malay Peninsula, may be set aside. The relationship of *Paracautleya* to the remaining 3 genera is less easy to clarify. In the short tubed corolla, which widens abruptly in the upper $\frac{1}{3}$, and the almost square, rather thick anther, there is a similarity to *Curcuma* which it also most closely resembles in habit. But, although in *C. albiflora*, for example, a few free bracts may occur at the base of the inflorescence the flowers of *Curcuma* commonly arise in cincinni held within pouches formed by adnate bracts. The singly borne ebracteolate flowers of *Paracautleya* indicate a closer relationship with *Cautleya* and *Roscoea* (separable from each other on fruit characters) but both these genera produce distinct, leafy stems and form many-seeded capsules.

The attachment of the ovules to the base of the ovary has not, as far as is known, been observed in *Cautleya* or *Roscoea* but occurs in certain species of *Boesenbergia* and *Scaphochlamys*. Such ovaries are commonly described as unilocular; in *Paracautleya* incomplete septa are clearly visible. Neither *Boesenbergia* nor *Scaphochlamys* has versatile anthers and the distichous bracts of the former are quite distinctive. The largely Malaysian *Scaphochlamys* is more interesting: the anther thecae have free basal tips and the bracts often approach those of *Paracautleya* in form. More information is needed on distribution and inflorescence structure in *Scaphochlamys*, but it seems highly probable that it forms a link between genera in *Zingiberaceae-Hedychieae* with versatile and those with non-versatile anthers.

Mr Bhat was kind enough to collect additional specimens of *Paracautleya* in 1976 and the resulting excellent spirit material has formed the basis for the accompanying figure. His co-operation and helpful comments on the structure of the ovary are gratefully acknowledged in the choice of epithet for the new species.

Paracautleya bhatii is a small rhizomatous herb up to 18 cm high, characterised by the slender, elongated naked peduncle which arises in a tuft of linear lanceolate leaves. There is no true stem. The inflorescence is shortly cylindric, and consists of probably up to 25 singly borne, shortly exerted, yellow flowers each subtended by a green bract. The lateral staminodes are conspicuous and petaloid, and there is a rather broad deflexed labellum. The ovules, which may number up to 10, are attached at the base of the imperfectly trilocular ovary and fruit is apparently readily produced; the very thin-walled, more or less globose capsule probably fractures irregularly and contains from 1-6 arillate seeds.

Paracautleya R. M. Smith, *genus novum* floribus solitariis ebracteolatis et antheris versatilibus calcaratis *Cautleyae* Royle simile, sed habitu acaulescente, pedunculo nudo et ovulis basalibus differt.

Herba rhizomatosa, acaulescens inflorescentia in pedunculo nudo e medio foliorum oriente. Bractae primariae spiraliter ordinatae, florem singulum ebracteolatum subtendentes. Calyx campanulatus. Corolla tubo brevi in triente superiore abrupte ampliata, triloba. Staminodia lateralia petaloidea; labellum late obovatum, bilobum. Filamentum latum; anthera versatilis thecis calcaratis. Glandes epigynae lineares. Ovarium imperfecte triloculare, ovulis usque 10 basalibus. Capsula globosa, parietibus tenuibus; semina 6 usque (plerumque pauciora) arillata.

Paracautleya bhatii R. M. Smith, *species nova* (fig. 1).

Herba parva glabra ad 18 cm alta, rhizomate e segmentis brevibus composito, radicibus fibrosis. *Folia* 2-7, laxae caespitosae, vaginis apertis; lamina lineari-lanceolata, usque ad 14×1 cm, acuta, basi in petiolum brevem (5 mm) angustata vel subsessilis; ligula membranacea, 1 mm longa, integra. *Inflorescentia* cylindrica 3.5×1.5 cm usque, in pedunculo nudo tenui ad 9 cm longo e medio foliorum oriente. *Bractee* primariae c. 25, ovatae, subacutae, $8-12 \times 5-8$ mm, densius dispositae et axem occultantes (bractea infima interdum 5-10 mm infra alias oriente et rarissime foliacea excepta). *Flores* flavi, sessiles. *Calyx* tenuiter membranaceus, campanulatus, undulatus, 4-5 mm longus ovario 1.5 mm longo incluso. *Corollae* *tubus* 1 cm longus, basi 1 mm paulo latior, in triente superiore abrupte ad 5 mm latitudinis ampliatus et hic intus parce pilosus; petalum dorsale late ellipticum, $6-7 \times 5-6$ mm, apice rotundatum vel leviter cucullatum; lateralibus paulo angustiora et breviora. *Staminodia* lateralibus oblonga, petaloidea, ad 10×5 mm; labellum deflexum, late obovatum, staminodiis lateralibus paulo brevius, c. 0.8 mm latum, saepe ad dimidium bilobum. *Stamen* 5 mm longum; filamentum latum, 3×4 mm; anthera versatilis, thecis c. 2 mm longis appendicibus basalibus incurvatis praeditis, connectivo in cristam minutam rotundatum prolongato. *Stylus* et stigma glabra. *Glandes* epigynae lineares, 1.5 mm longae, inter se liberae. *Ovarium* imperfecte triloculare, ovulis 10 usque (plerumque paucioribus) basalibus. *Capsula* subglobosa, c. 1 cm longa, parietibus tenuissimis, calyce persistente coronata. *Semina* (1-) 2-6, laevia, arilla integra vel leviter paucidentata praedita.

INDIA. South Kanara: Manipal, 2 miles from Udipi, 100 m, on rocks near Medical College, growing in moist rock crevices during monsoon, flowers yellow, 1 vii 1975, *Bhat* 204 (holo. E; iso. C); same locality, vii 1976, *Bhat* s.n. (spirit collection, E).