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A NEW GENUS OF ZINGIBERACEAE FROM N BURMA

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ABSTRACT. A new monotypic genus, *Stadiochilus* R. M. Smith, is described from N Burma; based on *S. burmanicus* R. M. Smith. The absence of lateral staminodes demands that it be placed in the tribe Alpineae but an affinity is shown with some members of the Hedychieae and the unsatisfactory nature of the existing major subdivisions of Zingiberaceae is discussed.

During his 1961/62 expedition to N Burma, Mr J. Keenan made several collections of a hitherto undescribed member of the Zingiberaceae. The plant was found on five occasions near the Kachin village of Hpuginkhu, which lies on the upper reaches of the Irrawaddy, and once at the nearby Mapi-Zup confluence. Within this restricted area it was apparently very common, favouring damp situations by river banks and flowering from December onwards. No fruiting material or rhizomes were obtained but examination of the inflorescence justifies the proposal of a new genus: *Stadiochilus* (*stadios*—erect, *chilus*—lip).

Stadiochilus burmanicus may be either epiphytic or terrestrial, from 15 cm–1 m high, the densely flowered red-purple inflorescences being borne terminally on a 3–7-bladed leafy stem. Each flower is subtended by a conspicuous bract and a tubular bracteole. The corolla lobes are narrowly lanceolate and there is an elongated linear filament. Lateral staminodes are entirely absent. It is the labellum which provides the most striking feature of the flower: it is held erect, the margins overlapping behind the filament, thus superficially resembling a tube beyond which the filament protrudes (fig. 1A).

Because *Stadiochilus* lacks lateral staminodes the existing classification of Zingiberaceae (K. Schum., *Pflanzenr. Zing.* (1904) emend. Loesen., *Pflanzenfam.* 2 Aufl. 15A (1930)) demands that it be placed in the Alpineae, but as will be shown below, there is a strong affinity with the Hedychieae.

In the Alpineae, as arranged by Schumann, *Stadiochilus* is most closely allied to the Sino-Burmese *Rhynchanthus* Hk. f. (fig. 2D) but the latter is readily distinguished by the large, petaloid, boat-shaped filament and by the minute labellum which is reduced to a mere point at the base of the filament, or is even (*R. beesianus* W. W. Sm.) entirely absent. There are no lateral staminodes in either genus. The two genera are remarkably alike in general facies, agreeing in the few bladed leaf-shoots and the unbranched terminal inflorescences of singly borne flowers. They also have another extremely interesting point in common: within the corolla tube the style lies in, and is completely obscured by, the curved edges of a deep groove which continues upwards throughout the length of the filament. For the filament to bear a groove is commonplace in the Zingiberaceae but occurrence of a groove within the corolla tube is rare. The condition occurs in several *Zingiber* species (Zingibereae), indeed perhaps to some extent in all, and in *Hedychium* (fig. 2B) and the monotypic *Brachychilum* (Hedychieae, fig. 2C). Some eight or nine species of *Hedychium* have been examined, and

there is every reason to suppose that the character is constant throughout the genus. Species of *Burbidgea, Riedelia, Amomum, Hornstedtia*, and a wide range of *Alpinia* (all Alpineae) reveal no such groove; here the style is often held by fleshy swellings at the mouth of the corolla tube. The presence of a corolla groove may eventually prove to be a useful new character in a family where good stable features at generic level are at a premium.

What is of extreme interest is the link with the Hedychieae, for in several other respects *Stadiochilus* bears more than a passing resemblance to *Hedychium*: the strap-shaped corolla-lobes and elongated filament are characteristic of that genus and if the labellum of *Stadiochilus burmanicus* is spread out it is remarkably like that of many *Hedychium* species, although lacking the deep bilobing often associated with that genus. In fact, if a pair of petaloid lateral staminodes were added to *Stadiochilus* we should have a perfectly good *Hedychium* rendered slightly anomalous by the upright, rather pendulous labellum.

S. burmanicus, therefore, highlights the unsatisfactory nature of one of the major subdivisions of the Zingiberoideae. When distinguishing the Hedychieae from the Alpineae the herbarium worker must rely heavily on the form of the lateral staminodes; conspicuous and petaloid in the former; much reduced, often to fleshy subulate points or mere swellings, in the latter. When staminodes *are* present the distinction is usually clear-cut but study of *Stadiochilus* and *Rhynchanthus* raises the question of how to deal with plants which are entirely without lateral staminodes. Hitherto, these have been placed in the Alpineae but the lateral staminodes that have been lost could as well have been large and hedychioid as small and alpinioid.

Schumann placed *Rhynchanthus* at the end of the Alpineae, beside the monotypic Sumatran *Nanochilus* K. Schum. (fig. 2A). The latter, an interesting plant originally described in *Hedychium* (*H. palembanicum* Miq.), also has a much reduced labellum, no more than 1 cm long. There is a very short, grooveless corolla tube which is much exceeded by the calyx and the style is held in position by the inrolled margins of the fleshy filament. The presence of petaloid staminodes over 2 cm long indicates that *Nanochilus* belongs to the *Hedychieae*—but it is clearly not a *Hedychium*. It has exactly the same unbranched inflorescence structure as *Stadiochilus* and *Rhynchanthus*—the flowers arising singly and each with a bract and tubular bracteole—and is also very similar to these genera in general facies.

In conclusion, it seems clear that the absence of lateral staminodes does not, in itself, necessarily indicate membership of either Hedychieae or Alpineae. That will have to be decided on other criteria, important amongst which is the plane of distichy of the leaf-shoot in relation to the rhizome. This is believed to be parallel in the Hedychieae (and is very obviously so in *Hedychium*) and transverse in the Alpineae. Only a small number of species have been checked and the character is difficult to use when dealing with short-stemmed or short-rhizomed plants. Unfortunately the plane of distichy of *Stadiochilus* is unknown, but, although herbarium material rarely provides more than an indication, a sheet of *Rhynchanthus beesianus* (*T.T.Yu* 16573, E), collected complete with rhizome, does seem to show parallel distichy.

Further observations on the plane of distichy are urgently needed and the tribal position of such genera as *Stadiochilus, Rhynchanthus* and

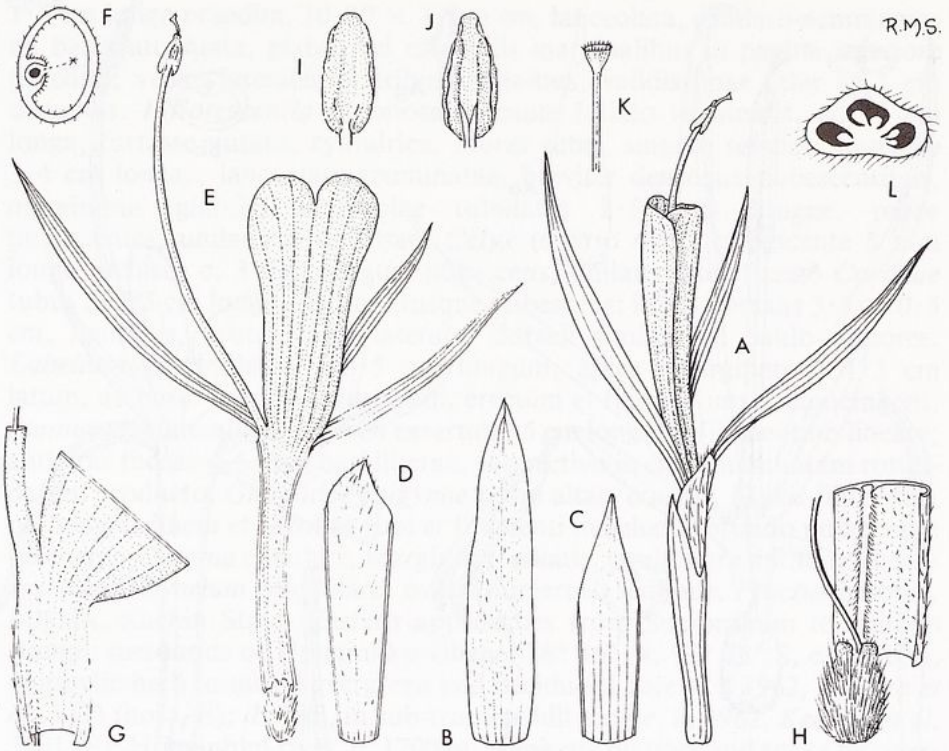

FIG. 1. *Stadiochilus burmanicus* R. M. Smith: A, flower with bracts × 1; B, bract × 1; C, tubular bracteole, dissected, × 1; D, calyx, dissected, × 1; E, corolla, dissected, × 1; F–H, corolla tube: F, in T.S. showing style (marked *) within groove × 10; G, upper part with lower part of filament, style within groove × 2; H, basal part with ovary, style removed from groove, × 3; I, J, anther, back and front, × 3; K, stigma × 3; L, ovary in T.S. × 6. (From dried material of *Keenan* 3733, holotype).

Nanochilus—the Thai *Pommereschea* may prove to be another—cannot be finally settled; however, their resemblance to *Hedychium* and the lack of a close affinity in the Alpineae suggests that the Hedychieae is more likely to be their correct tribe.

Stadiochilus R. M. Smith, **genus novum** *Rhychantho* Hook. f. bracteis conspicuis, bracteolis tubularibus, floribus singulis et stylo per longitudineum corollae tubi in sulco profundo latente similis; sed filamento lineari (in *Rhynchantho* petaloideo) et labello erecto conspicuo bilobo (in *Rhynchantho* minuto dentiformi vel absente).

Herba rhizomatosa. Inflorescentia in caule foliato terminalis. Bractea florem unum in bracteola tubulari subtendens. Calyx tubularis, unilateraliter fissus. Corolla lobis longis ligulatis. Labellum erectum filamentum exsertum circumcingens. Stamen filamento longo angusto, antherae connectivo fere ecristato. Stylus in sulco profundo per longitudinem et corollae et filamenti tubi; stigma cupulare margine ciliato; ovarium triloculare, placenta axili.

Stadiochilus burmanicus R. M. Smith, **species nova** (fig. 1).

Herba ad 1 m alta, terrestris vel epiphytica. *Folia* per caulem ad 7; ligula membranacea, integra, ad 2 cm longa; lamina subsessilis vel raro petiolo ad

FIG. 2. A, *Nanochilus palembanicus* (Miq.) K. Schum.: a, bract × 1; b, flower with bracteole × 1; c, corolla, dissected, × 2; d, corolla tube in T.S. × 4; e, anther × 2; f, filament in T.S. × 4 (from dried material of 3595 KB, U). B. *Hedychium coccineum* Buch.-Ham.: a, corolla, dissected, × 1; b, corolla tube in T.S. × 2 (from spirit material, cult. R.B.G. E.). C, *Brachychilum horsfieldii* (R. Br.) G. O. Peters: a, flower with bracteole × 1; b, lower part of filament, upper part of corolla tube, and labellum. × 2; c, corolla tube in T.S. × 4 (from spirit material, cult. R.B.G. E.). D, *Rhynchanthus*: a & b *R. beesianus* W. W. Sm.—a, corolla, dissected, × 1; b, corolla tube in T.S. × 2 (from dried material of *Forrest* 8108, holotype E); c, *R. longiflorus* Hk.f., stamen and rudimentary labellum × 1 (ex *Bot. Mag.* t. 6861).
* denotes position of style.

1·5 cm longo praedita, 10–30 × 3·5–6 cm, lanceolata, caudato-acuminata, ad basin attenuata, glabra vel raro pilis marginalibus in pagina inferiore praedita; venae laterales in tribus ordinibus, validissimae inter se 1 cm distantes. *Inflorescentia* racemosa in caule foliato terminalis, ad 12 cm longa, fortasse nutans, cylindrica. *Flores* rubri, singuli, sessiles. *Bracteae* 3–4 cm longae, lanceolato-acuminatae, breviter denseque pubescentibus, marginibus glabris; bracteolae tubulares 2·5–3 cm longae, parce pubescentes, unilateraliter fissae. *Calyx* (ovario dense pubescente 5 mm longo incluso) c. 3 mm longus, pubescens, unilateraliter fissus. *Corollae* tubus 2–2·5 cm longus, extra intusque pubescens; lobus dorsalis 3·5 × 0·5 cm, ligulatus, acutus; lobi laterales dorsali similes vel paulo minores. *Labellum* petaloideum 3–3·5 cm longum, apice emarginato 1–1·3 cm latum, ad basin sensim angustatum, erectum et filamentum circumcingens. *Staminodia* lateralia 0. *Stamen* exsertum, 5 cm longum; filamentum lineare; antherae thecae 4–5 mm, basi liberae, connectivo in cristam minutam rotundatum producto. *Glandulae epigynae* 1 mm altae, crassae. *Stylus* filiformis, per longitudinem et corollae tubi et filamenti in sulco profundo pubescente percurrens; stigma cupulare, marginibus ciliatis, paulo ultra antherae thecas exsertum. *Ovarium* triloculare, ovulis numerosis axilibus. *Fructus* ignotus. BURMA. Kachin State, Eastern approaches from Sumprabum to Kumon Range: surrounds of Hpuginhku village, 26° 36′ N, 97° 15′ S, c. 1700 m, epiphytic herb in mixed evergreen and deciduous forest, ii 1962, *Keenan et al.* 3733 (holo. E); *ibidem*, in sub-tropical hill jungle, iii 1962, *Keenan et al.* 3801 (E); Hpuginhku river, c. 1700 m, epiphytic on trees and rocks by river-side, abundant, fls. purplish red, 13 i 1962, *Keenan et al.* 3250 (E); *ibidem*, 2600–3000 m, by stony river bed, 15 cm high, fls. rose-red, 31 xii 1961, *Keenan et al.*. 3107 (E); *ibidem*, 1700–2000 m, i 1962, *Keenan et al.* 3230 (E, infl. only); Mapi-Zup confluence, 1300–1700 m by pathside in association with Begonia, Bambusa and herbs, plentiful, 1 m tall, fls. purplish red, 17 i 1962, *Keenan et al.* 3269 (E).