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# Lectotypification of *Hedychium thyrsiforme* Buch.-Ham. ex Sm. (Zingiberaceae)

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**ABSTRACT**
The tropical and subtropical Asian genus *Hedychium* J.Koenig (Zingiberaceae) comprises over 90 recognized species, with more than twice as many published names. It is renowned for its enduring taxonomic uncertainties. Here, we assign the lectotype for *H. thyrsiforme* Buch.-Ham. ex Sm. and provide comprehensive morphological description for this species.

**KEY WORDS**
Zingiberaceae,
India,
lectotypification.

**RÉSUMÉ**
*Lectotypification de* Hedychium thyrsiforme *Buch.-Ham. ex Sm. (Zingiberaceae).*
Le genre tropical et subtropical asiatique *Hedychium* J.Koenig (Zingiberaceae) comprend plus de 90 espèces reconnues, avec plus de deux fois autant de noms publiés. Il est réputé pour ses incertitudes taxonomiques persistantes. Nous désignons ici un lectotype pour *H. thyrsiforme* Buch.-Ham. ex Sm. et fournissons une description morphologique complète de cette espèce.

**MOTS CLÉS**
Zingiberaceae,
Inde,
lectotypification.

## INTRODUCTION

Johann Gerhard Koenig established the genus *Hedychium* in 1783 (Koenig 1783), based on an illustration of *Gandasulum* by Georg Eberhard Rumphius (Rumphius 1747; Sanoj 2011; Ashokan & Gowda 2017; Ashokan & Gowda 2019). Following the initial description of *H. coronarium* by J. G. Koenig, James Edward Smith expanded the genus by adding four more species (*H. coccineum*, *H. ellipticum*, *H. spicatum* and *H. thyrsiforme*; Smith 1811). During the nineteenth and twentieth centuries, numerous *Hedychium* species were described (Smith 1811; Roscoe 1824-1825; Wallich 1853; Horaninow 1862; Baker 1892; Schumann 1904), often with insufficient type information, leading to persistent taxonomic challenges within the genus (Sanoj 2011; Ashokan & Gowda 2023). In this study, we aim to lectotypify *H. thyrsiforme* that was originally described by J. E. Smith (Smith 1811).

## MATERIAL AND METHODS

We carried out field collection trips between 2015 and 2019 across Northeast (NE) India. Metadata documentation included morphological, phenological, and ecological characteristics. Morphological measurements were taken using both a ruler and digital calipers. Collected specimens comprised herbarium vouchers and spirit samples, and leaf tissues preserved in silica for molecular studies (Ashokan *et al.* 2022).

Protologues of all *Hedychium* names were examined in monographs and taxonomic revisions (Koenig 1783; Smith 1811; Roscoe 1824-1825; Wallich 1853; Horaninow 1862; Baker 1892; Schumann 1904; Naik & Panigrahi 1961; Rao & Verma 1969; Srivastava 1984; Smith 1994; Sanoj 2011). Herbarium specimens, including type collections, were studied at the listed herbaria. Additionally, digital resources were consulted, including Global Plants (https://plants.jstor.org/), the Kew Herbarium Catalogue (http://apps.kew.org/herbcat/), Muséum national d'Histoire naturelle (https://science.mnhn.fr/), the Smithsonian Institution (https://www.si.edu/), The Linnean Collections (http://linnean-online.org/), and the Zingiberaceae Resource Centre (http://padme.rbge.org.uk/ZRC/).

### Abbreviations

*Collection acronyms*

| | |
|---|---|
| ARUN | Herbarium, Botanical Survey of India, Arunachal Pradesh Regional Centre; |
| ASSAM | Herbarium, Botanical Survey of India, Eastern Regional Centre; |
| BHPL | Herbarium, Indian Institute of Science Education and Research Bhopal; |
| BM | Herbarium, The Natural History Museum; |
| BO | Herbarium Bogoriense, The National Research and Innovation Agency; |
| BSA | Herbarium, Botanical Survey of India, Central Regional Centre; |
| BSHC | Herbarium, Botanical Survey of India, Sikkim Himalayan Circle; |
| BSI | Herbarium, Botanical Survey of India, Western Circle; |
| CAL | Herbarium, Botanical Survey of India, Howrah; |
| E | Herbarium, Royal Botanic Garden Edinburgh; |
| K | Herbarium, Royal Botanic Gardens, Kew; |
| LINN | Herbarium, Linnean Society of London; |
| LIV | Herbarium, World Museum, National Museums Liverpool; |
| MH | Herbarium, Botanical Survey of India, Southern Circle; |
| QBG | Herbarium, Queen Sirikit Botanic Garden, Chiang Mai; |
| SING | Herbarium, Singapore Botanic Gardens; |
| TBGT | Herbarium, Tropical Botanic Garden and Research Institute, Kerala. |

## TAXONOMIC TREATMENT

Family Zingiberaceae Martinov, *nom. cons.*
Genus *Hedychium* J.Koenig.

***Hedychium thyrsiforme*** Buch.-Ham. ex Sm.
(Fig. 1)

*Hedychium* no. 5, Cycl. 17 (Smith *in* Rees 1811).

Type material. — **Nepal** • *Buchanan-Hamilton s.n.*; lectotype: LINN [8.34!], **here designated** (Fig. 1A).

Phenology and ecology. — Flowering from August to September. Fruiting September to October. Flowers are not remarkably fragrant.

Global distribution. — India (Arunachal Pradesh, Sikkim, Manipur, Mizoram, Nagaland), Bhutan, Myanmar, Nepal; this taxon is distributed at an elevation of more than 1400 m.

IUCN status. — We categorize it as data deficient (DD) following the IUCN guidelines (IUCN Standards and Petitions Subcommittee 2024).

Etymology. — The specific epithet, "*thyrsiforme*", refers to the inflorescence: panicle-like or thyrsoid (thyrsi-); resembling or shaped (-forme).

Vernacular name. — Pincushion Ginger Lily.

Morphological affinities. — *Hedychium thyrsiforme* closely resembles *H. larsenii* in its pyramidal inflorescence, white flowers, and the size of the labellum, lateral staminodes, and filament. However, the two species differ in the lengths of the bracteole, calyx, floral tube, anther, and lamina (Table 1).

Phylogenetic placement. — *Hedychium thyrsiforme* is consistently recovered in the clade IV in phylogenetic reconstructions of the genus (Wood *et al.* 2000; Ashokan *et al.* 2022).

### Description

Terrestrial, rhizomatous herb up to 1.2 m tall; rhizome branching parallel to leaf distichy, pale brown externally, creamy white internally; leafy shoot slanting with an erect inflorescence; basal sheath greenish. Leaves sessile; sheath pale green; ligule 3.2-4.8 cm wide, ovate, densely sericeous, pale green; lamina 31-44 × 8-14 cm, elliptic-lanceolate, glabrous and dark green (adaxial) and densely sericeous and pale green (abaxial); acumen 2.5-3.0 cm long, ends in a small caducous appendage; base cuneate. Inflorescence 8-13 × 6-10 cm, dense, pyramidal; rachis hidden; peduncle pubescent,

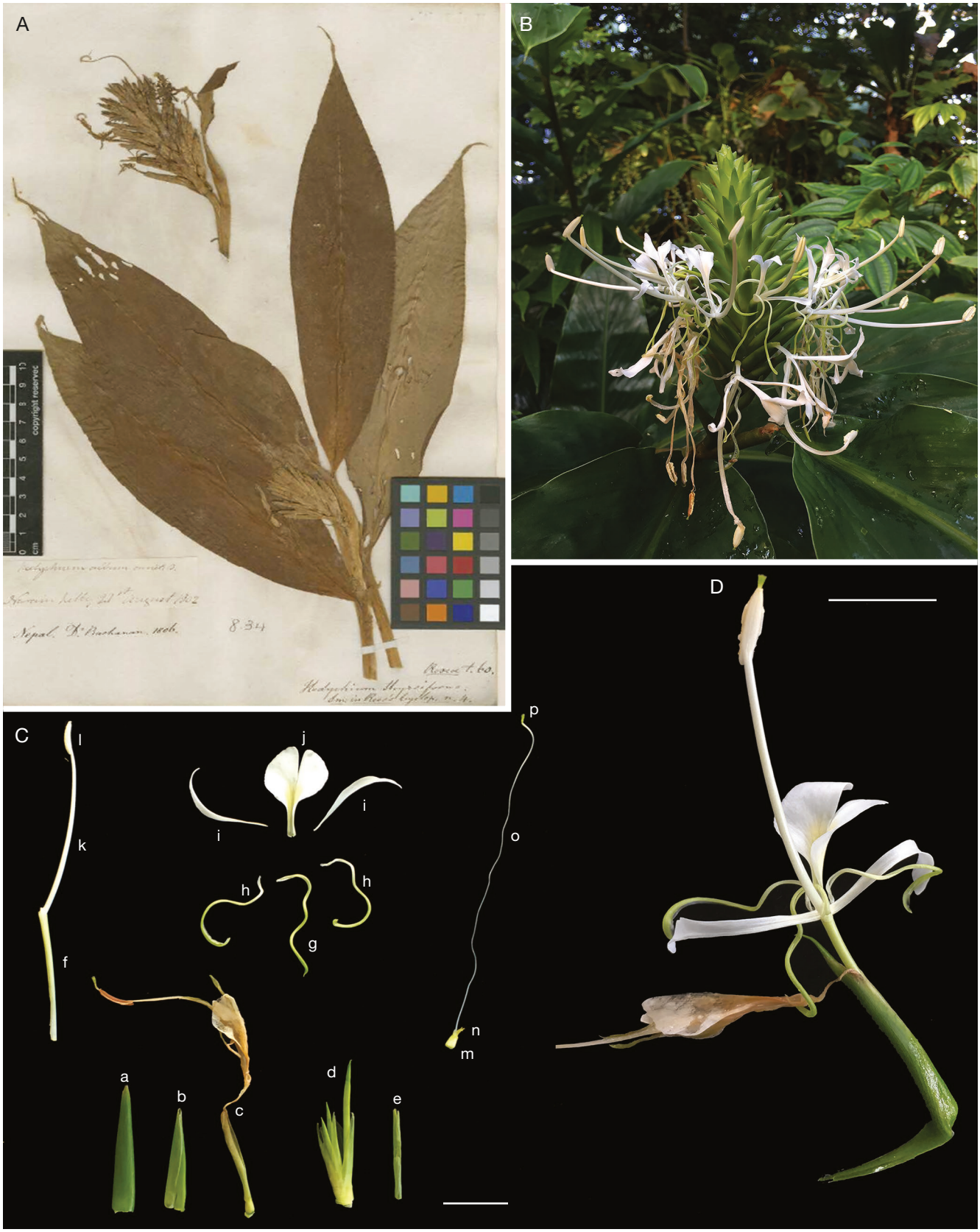


FIG. 1. — *Hedychium thyrsiforme* Buch.-Ham. ex Sm.: **A**, lectotype of *H. thyrsiforme* available at LINN; **B**, inflorescence; **C**, floral parts: **a**, bract; **b**, bracteole; **c**, old flower; **d**, young flower buds; **e**, calyx; **f**, floral tube; **g**, dorsal corolla lobe (× 1); **h**, lateral corolla lobes (× 2); **i**, lateral staminodes (× 2); **j**, central labellum; **k**, filament; **l**, anther; **m**, ovary; **n**, epigynous nectaries (× 2); **o**, style; **p**, stigma; **D**, flower. Scale bar: C, D, 2.0 cm. Photo credit: A, © Linnean Museum; B, C, D, Ajith Ashokan.

green; bracts 2.5(3.2 × 1.1-1.2 cm, elliptic, puberulent, green, folded, involute, 2-6 flowered; bracteoles 2.0-2.5 cm long, tubular, pubescent, pale green. Flowers 11.5-13.5 cm long, ascending, white (when fresh), dull white the second day, many flowers (10-15) open simultaneously, faintly fragrant; calyx 2.4-3.0 cm long, tubular, translucent, 3-toothed at tip, slightly hairy at tip, pale green; floral tube 3.4-4.2 × 0.2-0.3 cm, glabrous, erect, white; corolla lobes linear, curled, orientated downwards, glabrous, pale green; dorsal lobe 5.2-5.9 cm long, linear, curled (more curled as the flower ages), glabrous, beaked at tip, embracing the filament and anther in the bud stage, pale green; lateral lobes 5.1-5.7 cm long, linear, curled (more curled as the flower ages), non-beaked at tip, glabrous, white; lateral staminodes 3.0-3.6 cm long, widest part 0.4 cm, narrowly oblanceolate, one edge linear, obtuse, unguiculate, upper halves reflexed backwards, positioned acute (< 80°) with respect to labellum, white, pale yellow towards base; central labellum 2.2-3.0 × 2.0-2.5 cm, orbicular, glabrous, white with light yellow blotch, bilobed, canaliculate, distinctly clawed; lobes acute, upper halves slightly reflexed backwards; sinus 0.9-1.3 cm deep; claw 1.0-1.3 × 0.2-0.3 cm; filament 5.5-6.5 cm long, slightly arching, deeply grooved on one side, white; anther 0.9-1.1 cm long, linear, basifixed, cream white; thecae 2, split longitudinally; connective 0.1-0.2 cm long, cream white; stigma 0.1 cm wide, cup-shaped, hairy at tip, exserted from the anther by at least 0.1 cm, greenish yellow; style 11.4-13.4 cm long, filiform, white; epigynous nectaries 0.3-0.6 cm long, glabrous, pale yellow; ovary 0.3-0.4 × 0.2-0.3 cm, barrel-shaped, pubescent, yellowish green; placentation axile; ovules spherical, white. Fruit not seen.

### Typification remarks

Francis Buchanan-Hamilton (1762-1829), a Scottish surgeon with the British East India Company, participated in a diplomatic mission to Nepal from 1802 to 1803, during which he collected numerous plants, including *Hedychium* (Watson & Noltie, 2016). On his return to Britain, he gave his collections, notes and drawings to J. E. Smith, the founding President of the Linnean Society of London, and the person to whom the Court of Directors of the British East India Company turned when they needed botanical advice (Watson & Noltie, 2016). A partial set of Buchanan-Hamilton's botanical collections also went to Aylmer Bourke Lambert; this material is now at the Natural History Museum, London while the material given to J.E. Smith is still held at the Linnean Society of London. Using Buchanan-Hamilton's collections and notes, Smith described four species of *Hedychium* including *H. thyrsiforme*. The entry in Rees's Cyclopaedia for *H. thyrsiforme* should be quoted, 'Gathered by Dr Buchanan, in August 1802, at Narainhetty, in Upper Nepal, with the last [*H. spicatum*], from which by name the natives do not distinguish it'. During our visit to the Linnean Society of London Herbarium (LINN), we discovered a specimen of *H. thyrsiforme* in the Smith Herbarium at LINN. This specimen carries the date "August 1802" and the location "Narainhetty, Upper Nepal" as recorded in Rees's Cyclopaedia (Smith, 1811). Based on this finding, we designate it as the lectotype.

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