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LXVIII.—HEDYCHIUM CORONARIUM AND ALLIED SPECIES.

W. B. TURRILL.

(With Plates.)

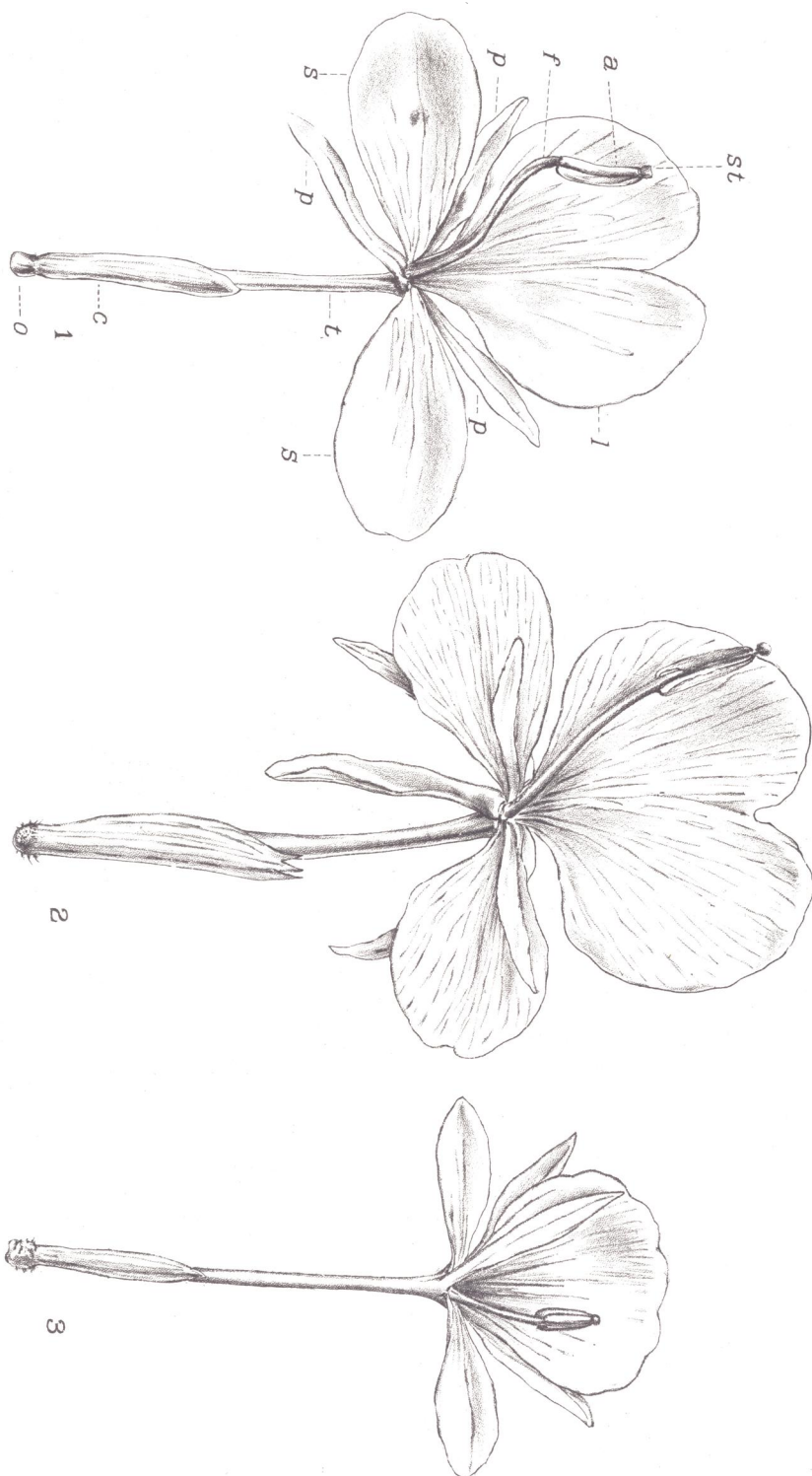
Recent investigations into the possibilities of using species of *Hedychium* as a source of material for paper-making* have made it particularly desirable that a clear understanding of the exact botanical position of the plants experimented with should be obtained. The species dealt with in the present paper are all closely allied to one another, and the extreme difficulty experienced in dealing with dried specimens had resulted in great confusion of names and the sorting together of distinct forms. The latest monograph of *Hedychium* is that by K. Schumann in Engler's *Pflanzenreich*, 20. Heft (iv. 46), 1904, but it adds little to our knowledge of *H. coronarium* and its allies. Two older works dealing with the genus must be mentioned, the one, Roscoe's "Monandrian Plants of the Order Scitamineae," was published at Liverpool in 1828 and contains beautiful coloured plates of many species with corresponding descriptions in English, the other, Wallich's "Attempt to define the species of *Hedychium*," was published in the *Kew Journal of Botany*, V., p. 321, 1853, and contains Latin diagnoses of 23 species with full lists of synonyms.

It is proposed here to enumerate those species which have been considered by various authors to be varieties of *H. coronarium* and to give briefly the most important characters of each, but mention must first be made of *H. coronarium* itself. This most widely distributed and commonly cultivated species of *Hedychium* was described by Koenig in Retz. Obs. iii. p. 73, 1783, and has the following characters which distinguish it from other species of the genus: bracts large, coriaceous, closely imbricated, forming a more or less ovate strobilus and each protecting from four to six flowers which arise in succession; calyx tubular, split on one side, less than half the length of the corolla-tube, glabrous; corolla-tube 6-8 cm. long, cylindrical; corolla-segments 3, linear-lanceolate, equal, declined; lip large, broad, abruptly narrowed at the base, divided—but generally not deeply—into two elliptic-ovate lobes which are sometimes further lobed, pure white or slightly yellow in the lower part; lateral staminodes oblong- or ovate-elliptic, pure white or yellowish in the lower part; filament with the anther shorter than the lip, white or yellowish; the inferior ovary glabrous or slightly or densely hairy in the flowering stage. This plant is found wild or naturalized in most tropical countries. Good figures are to be found of it in: Roscoe, *Monandr. Pl.* t. 51; *Bot. Mag.*, t. 708; Smith, *Exotic Plants*, ii., t. 107.

The *H. maximum* of Roscoe, *Monandr. Pl.*, t. 52, is probably a variety of *H. coronarium*, distinguished by having broader leaves, distinctly ciliated bracts, large flowers, the lateral staminodes frequently with a lobe or tongue projecting from the centre, the filament tinged with pink, and the ovary and calyx densely pubes-

* See *Kew Bulletin*, 1912, p. 373; 1914, pp. 165, 193.

M. Smith, del.



cent. The writer has seen only one specimen of *H. maximum* and that a cultivated one. Its native country is unknown.

Two species which are closely related to *H. coronarium* and which in common with it have the filament and anther together shorter than the lip must now be considered. Both have yellow flowers which are smaller than those of *H. coronarium*. The first, *H. urophyllum*, Lodd., Bot. Cab., t. 1785, 1831, has frequently been reduced either to *H. coronarium* or to *H. flavum* or kept as a variety of one of these species, but in accordance with our present knowledge it seems best to consider it a distinct species specially characterised by having all the parts of the corolla and androecium deep yellow in colour, the lip entire or with only a slightly bilobed or undulating margin, and a stout filament which with the anther is distinctly shorter than the lip. The only flowering specimens of this plant at Kew are from Khasia, 900–1200 m. There is an excellent figure in the Botanical Magazine, t. 3039, under the name *H. flavum*, Roxb., from which plant, however, it is quite distinct, having larger flowers and a relatively shorter calyx.

The second species, *H. Elwesii*, is also known only from the Khasia Hills district, where it has been collected by H. J. Elwes and C. B. Clarke and figured by Sir J. D. Hooker. It was described by J. G. Baker in the Flora of British India, vi., p. 226, 1892, and has the following distinguishing features: flowers bright yellow; lip broad and distinctly two-lobed; filament slender, of a bright red colour.

Hedychium flavescens, Carey ex Roscoe, Pl. Monandr., t. 50, is a distinct species with the following important characters: flowers large, up to 14 cm. long, yellowish, the colour deeper in the basal portion; calyx nearly half as long as the corolla-tube; lip obovate-orbicular, bilobed, narrowed below to form a distinct claw; filament with the anther slightly longer than the lip. Apparently wild specimens of this plant are preserved at Kew from India and the Mascarenes, and it is often found in cultivation. Besides the accurate figure in Roscoe's work that in Wallich's Icones, t. 2008-9, may be mentioned.

Hedychium chryssoleucum, Hook., figured and described in Bot. Mag., t. 4516, is probably only a form of *H. flavescens*, with the base of the lip and lateral staminoides a deep orange-yellow. This form is also figured in Lindley and Paxton, Flower Garden, p. 110, t. 77.

We have now to deal with two plants concerning which there has been an unfortunate confusion. The name *Hedychium flavum* was first applied by Roxburgh in the Hortus Bengalensis, p. 1, 1814, to a plant called by the natives Katta-tilook-seer, and said to have been collected in Silhet by Mr. M. R. Smith in 1810. There is at Kew one of Roxburgh's drawings, No. 2153, named *H. flavum*, R., and this, on the whole, agrees with the description published in Roxburgh's Flora Indica, 1., p. 81, 1820, which was edited by W. Carey with the assistance of Wallich, but here the native name is given as Kattia-rityam. In the manuscript editions of Roxburgh's Flora Indica at Kew and the British Museum Catteah-tilluk-see and Catteek-tilluk-seer are given as the vernacular names of *H. flavum*. Whatever Carey and Wallich

intended by *H. flavum* there seems no doubt that the plant intended by Roxburgh is quite different from that to which Roscoe, Pl. Monandr., t. 49, and most authors since his time have applied the name. The main distinguishing characters of *H. flavum*, Roxb., are: leaves with a long fine acumen; spike oblong, with imbricate bracts which are oblong-ovate, subobtuse, about two and a half inches long and nearly one and a half broad; calyx nearly as long as the corolla-tube; lip obcordate, narrowed suddenly below into a very short claw, yellow with an orange patch in the centre and below; the filament with the anther about as long as or slightly shorter than the lip; ovary pubescent.

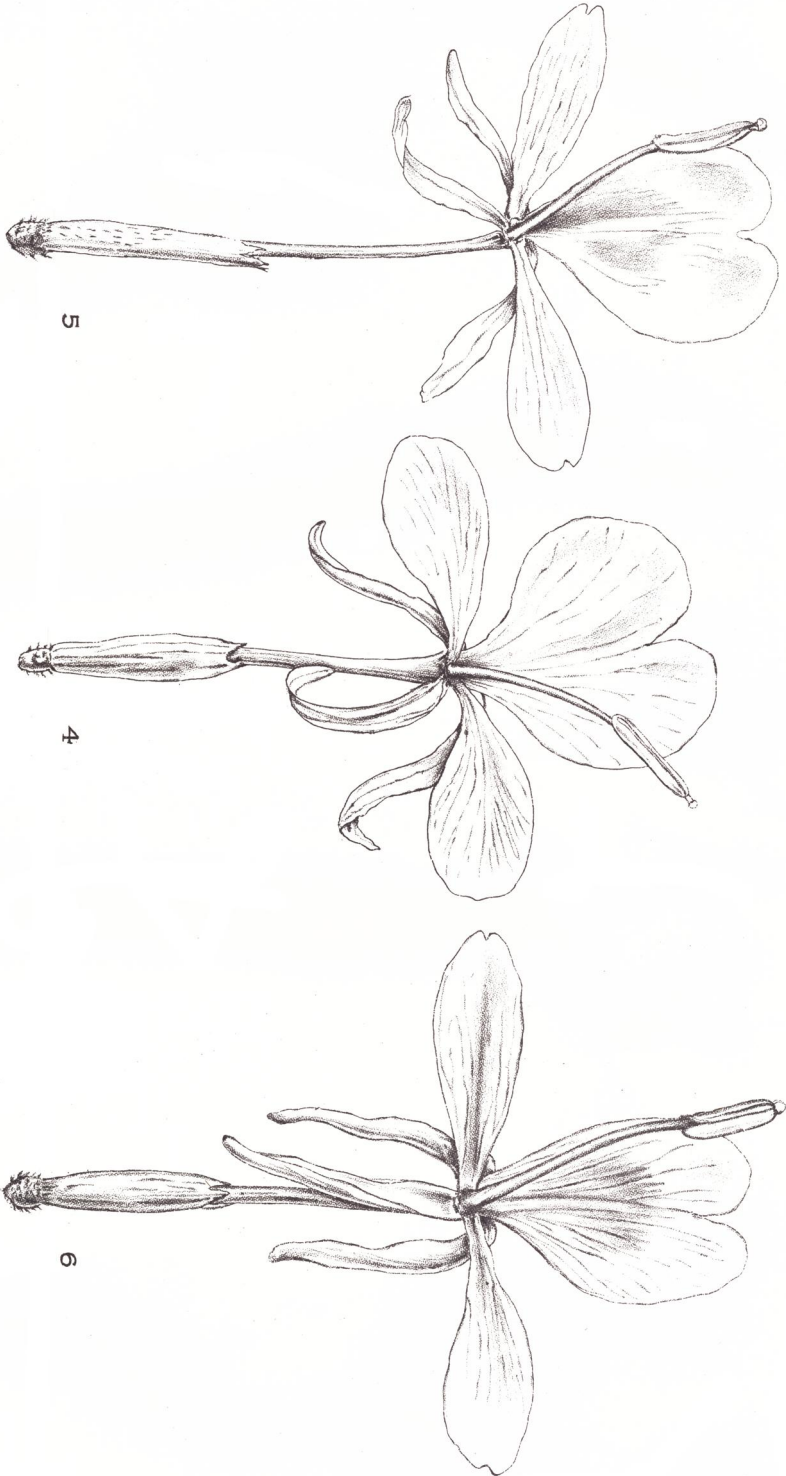
7. *H. flavum*.8. *H. subditum*.

For the *Hedychium flavum* of Roscoe, non Roxb., the name *H. subditum*, Turrill, is proposed. The plant is distinguished by having flowers 10-11 cm. long, a calyx about half as long as the corolla-tube, an ovate bilobed or obcordate lip which is narrowed into a distinct claw below, and by a filament which with the anther is distinctly longer than the lip. The plant named *H. flavum* in Lodd., Bot. Cab., t. 604 is probably this species.

The plants represented in Bot. Mag., t. 2378 and Lodd., Bot. Cab., t. 723 are very similar, and both are probably hybrids between *H. spicatum*, J. E. Sm., and *H. subditum*, Turrill.

In order to facilitate the identification of specimens the following key to the species dealt with above has been prepared:

M. Smith. del.



Flowers pure white or with only a tinge of yellow.

Lip about 4.75×4 cm. *H. coronarium*, Koenig.

Lip 6.75×4.5 cm. *H. maximum*, Roscoe.

Flowers yellow to orange.

Lip entire, slightly bilobed or with a wavy margin; filament stout, yellow. *H. urophyllum*, Lodd.

Lip distinctly bilobed.

Filament slender, of a bright red colour; lip broad.

H. Elwesii, Baker.

Filament yellow.

Flowers 13 to 14 cm. long.

Lip and lateral staminodes yellow.

H. flavescens, Roscoe.

Lip and lateral staminodes deep or orange-yellow towards the base.

H. chryssoleucum, Hook.

Flowers 8 to 11 cm. long.

Calyx nearly as long as the corolla-tube; filament with the anther as long as or slightly shorter than the lip.

H. flavum, Roxb.

Calyx about half as long as the corolla-tube; filament with the anther distinctly longer than the lip.

H. subditum, Turrill.

It has already been stated that much of the confusion which is found in the systematic works dealing with *Hedychium* is due to the difficulty of working satisfactorily with dried material. The large majority of the specimens preserved in the Kew and British Museum Herbaria are leafy inflorescences which were dried entire with the flowers still on, and no attempt was made to preserve the shape of the floral parts. Consequently, it is often impossible to make out such important characters as the shape of the lateral staminodes and labellum and the relative length of the filament. Moreover, the usual method of preparing dried flowers for dissection by boiling in water is not satisfactory here, for with such treatment they generally form a soft pulpy mass from which their original structure cannot be determined. However, if the following hints are carefully followed the preparation of adequate herbarium specimens is a comparatively simple matter. A specimen should be selected which is in full flower and a complete stem taken and cut up into suitable lengths of about 15 inches. Each length should be numbered, so that on examination of the dried material the sequence of the specimens is obvious. The leafy portions can be dried in the ordinary manner, the leaves when larger than the sheet of drying paper being carefully bent over. A few leaves with complete ligules should be dried separately. The inflorescence is best taken with two or three leaves still attached just below it, and sliced down the centre, each half being dried alone. The chief care, however, should be given to the drying of individual flowers. Buds, young, mature and old flowers should be taken from the axils of the bracts and laid separately between sheets of blotting or other absorbent paper. It is essential that each flower so dried should be complete, and care is needed to ensure that the small inferior ovary is detached from the inflorescence with each flower taken. The various floral parts, perianth

segments, lateral staminodes and labellum should be spread out flat, and, as far as possible, should not overlap one another. Under moderate pressure the flowers soon dry, and the paper actually containing the flowers should not be changed until drying is complete.

As it seems likely that species of *Hedychium* may attain considerable economic importance in the future, it is to be hoped that correspondents desiring names for plants of this genus will forward specimens which have been dried according to the instructions here given.

EXPLANATION OF PLATES AND FIGURES IN TEXT.

The figures represent the flowers, all three-quarters natural size, of the species dealt with above. The various floral parts in the figure of *H. coronarium*, Koenig, have been given distinguishing letters, a key to which is given below. As the figures of all the flowers are drawn approximately with the same orientation, it will be easy to determine the different organs by comparison with this one figure and the key.

Figure 1. *Hedychium coronarium*, Koenig. o. ovary. c. calyx. t. corolla-tube. p.p.p. corolla segments. l. labellum or lip. ss. lateral staminodes. f. filament. a. anther. st. stigma.

Figure 2. *H. maximum*, Roscoe. From the type specimen in Herb. Kew., showing additional lobes on the lateral staminodes.

Figure 3. *H. urophyllum*, Lodd. From a specimen in Herb. Kew., collected by Hooker in the Khasia Hills.

Figure 4. *H. Elwesii*, Baker. From a specimen in Herb. Kew., collected by C. B. Clarke in the Khasia Hills.

Figure 5. *H. flavescens*, Roscoe. From a specimen cultivated in Ceylon.

Figure 6. *H. chrysoleucum*, Hook. Adapted from the figure of the type in Bot. Mag. t. 4516.

Figure 7 (text-figure). *H. flavum*, Roxb. From the drawing of the type plant in Herb. Kew.

Figure 8 (text-figure). *H. subditum*, Turrill. From a cultivated specimen preserved in Herb. Kew.

LXIX.—NEW ORCHIDS. DECADE 43.

421. *Cirrhopetalum formosanum*, Rolfe; a *C. elato*, Hook. f., foliis latioribus, scapis duplo brevioribus, et saepissime bifloris, et sepalis lateralibus longioribus differt.

Pseudobulbi approximati, ovoidei, vaginis ovatis acuminatis venosis vestiti, monophylli, 1–1.5 cm. longi. *Folia* breviter petiolata, elliptico-oblonga, acuta, coriacea, 7–10 cm. longa, 2.5–4 cm. lata; petioli 0.5–1 cm. longi. *Scapi* graciles, circiter 9 cm. longi. vaginis lanceolatis paucis obtecti, pauciflori. *Bracteae* oblongo-lanceolatae, acutae, subconcaevae, 4 mm. longae. *Pedicelli* subrecti, 1 cm. longi. *Flores* mediocres, umbellati. *Sepalum* posticum oblongo-lanceolatum, acutum, concavum, eciliatum, 1.2