





## A new species of *Bulbophyllum* from section *Lepidorhiza* (Orchidaceae) from the Bird's Head Peninsula, Indonesian New Guinea

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### Abstract

A new species of *Bulbophyllum* from section *Lepidorhiza*, *B. abuniorum* Saputra & Schuit., is described based on specimens from the Bird's Head Peninsula, New Guinea. A detailed morphological description and diagnosis, information on distribution and ecology, and a preliminary conservation assessment are provided. A key to the species of *Bulbophyllum* section *Lepidorhiza* in New Guinea is also presented.

### Introduction

New Guinea is the richest island in the world in terms of plant species diversity, and Orchidaceae is by far the most diverse plant family there with close to 2,900 known species (Cámara-Leret *et al.* 2020). However, New Guinea has also been identified as the second most significant of 32 global plant diversity darkspots, i.e., regions that have the greatest shortfall in knowledge about plant diversity and distribution (Ondo *et al.* 2024). Assuming that for most plant families this shortfall is proportional to the number of known species recognized in the family, we can expect the greatest number of species yet to be discovered in New Guinea to be orchids. In recent years, several field trips within the project 'Orchids of the Bird's Head Peninsula' have been conducted to increase our knowledge of the orchid flora of the westernmost part of New Guinea. As a result, a number of new species from this area have been described, e.g. *Bulbophyllum wiratnoi* Saputra, Schuit., Mustaqim & J.Champ. (Saputra *et al.* 2023a: 283), *B. whitteniorum* Saputra, Schuit., Metusala & Heatubun (Saputra *et al.* 2023b: 37), *Dendrobium spiculatum* Schuit. (Schuiteman & Wanma, 2017: 84), and the latest published two new species, i.e. *Dendrobium wanmae* Schuit., Saputra & Heatubun (Schuiteman *et al.* 2024:115) and *Mediocalcar gemma-coronae* Schuit., Wanma, Saputra & Heatubun (Schuiteman *et al.* 2024:119).

Here, we describe a new species of *Bulbophyllum* sect. *Lepidorhiza* Schltr. This section consists of about 27 species that are distributed from Borneo, Sulawesi (Indonesia), the Philippines, Maluku (Indonesia), and New Guinea, to the western Pacific Islands. According to the sectional classification of *Bulbophyllum* by Vermeulen (in Vermeulen *et al.* 2014), it is characterised by racemose inflorescences, a pedicel articulated above the base of the floral bract, relatively large, distichous flowers, and verrucose or papillose roots. Apart from the verrucose/papillose roots this section is similar to sect. *Intervallatae* Ridl. Six species of *Bulbophyllum* sect. *Lepidorhiza* were previously known

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from New Guinea (de Vogel *et al.* 2024), so that our finding increases the number to seven; five of these are endemic. A key for the identification of the New Guinea species of *Bulbophyllum* sect. *Lepidorrhiza* is presented below.

## Materials and Methods

Living plants without flowers were collected on 29 July 2023 in Bamusbama District, Tambrau Regency, Southwest Papua (Papua Barat Daya) Province. In cultivation in Sorong, flowers first opened on 2 September 2023. The gathering of data and specimen preparation were carried out in accordance with the Kew Herbarium Handbook (Davies *et al.* 2023). Inflorescences and flowers were preserved in 70% ethanol + a small portion of glycerine (about 5% of solution). The description is based on fresh, dried and spirit material. The measurements were carried out on macro photographs with scale included, then calibrated and measured using ImageJ Software (Schneider *et al.* 2012). The morphological terminology used in the descriptions follows the Kew Plant Glossary (Beentje and Williamson 2012). The relevant protologues of *Bulbophyllum* sect. *Lepidorrhiza* from New Guinea and elsewhere were carefully studied.

## Taxonomy

***Bulbophyllum abuniorum*** Saputra & Schuit., sp. nov.

**Type:** Indonesia: Southwest Papua Province: Tambrau Regency, along the national road near the North Tamrau Mountains Nature Reserve, R. Saputra, H. Ulimpa, F.F.D. Darwis, J. Agaki, W. Nuburi, GIZ 002, flowered in cultivation 2 September 2023. (holo: MAN!; iso: BO!).

**Diagnosis:** *Bulbophyllum abuniorum* is similar to *Bulbophyllum levyae* Garay, Hamer & Siegerist (1995:176) especially in the shape of sepals and petals, the relatively long lip, and in the several simultaneously opening flowers (flowers usually opening one at a time in other species of sect. *Lepidorrhiza*), but differs in having a slightly clawed lip at the base (vs. not clawed in *B. levyae*), densely irregular conical-subulate teeth all over the adaxial surface of the lip (vs. lip with papillae in the middle, smooth elsewhere), margin of lip laciniate basally, strongly serrate centrally, and crenate apically (vs. margin entire throughout).

Epiphyte, stout, to about 40 cm high. Rhizome short, creeping. Roots mainly from below the pseudobulbs, spreading and densely and coarsely papillose, c. 1.3 mm diam. Pseudobulbs c. 1 cm apart, elongate-ovoid, c. 3 cm long, c. 1.7 mm diam. Leaves fleshy, elliptic to linear, 30.5–32.5 × 3.8–4.3 cm, base shortly petiolate, glabrous, margin entire, apex acute. Inflorescence suberect, slightly curved in apical part, c. 24.5 cm long, 2.3–4.3 mm diam, glabrous, 4–7-flowered with the flowers c. 1.2 cm apart, most of the flowers opening simultaneously. Floral bract light green, sheathing, appressed, triangular, c. 7–10 × 5 mm, glabrous, margin entire, apex acute to minutely apiculate. Pedicel and ovary subterete and narrowly triangular in outline, slightly curved, c. 9.6–10.2 mm long, 4 mm diam, glabrous. Flowers opening widely, c. 2.3 cm across, compressed vertically (dorsal sepal and lateral sepals almost lie in parallel planes), lateral sepals pale to bright yellow with red-orange spots along the veins; dorsal sepal light yellow with white margin; petals yellowish white; lip yellowish orange with reddish brown spots on the basal centre and basal margins; column yellow-cream; anther orange with white margin;

pollinia light yellow. Lateral sepals narrowly obliquely triangular, 29.4–36.4 × 8.5–10 mm, conduplicate, dorsally strongly keeled, with the keel c. 5 mm tall, glabrous, margins entire, apex obtuse to acute. Dorsal sepal narrowly ovate, 24.7–27.5 × 8.3–9.4 mm, glabrous, margins entire, apex obtuse to acute. Petals triangular to obliquely broadly triangular, c. 7.2–7.6 × 5–6.1 mm, glabrous, margin entire, obtuse to acuminate apex. Lip elliptic, fleshy, 22.4–25.1 × 10.6–11.9 mm, clawed at the base, widest part near middle, densely covered with irregular conical-subulate teeth with obtuse tip, basal margin laciniate, middle margin strongly serrate, apical margin crenate, apex obtuse. Column 6.4 mm long, 3.7 mm wide, glabrous, small stelidia porrect, 3-denticulate, c. 0.6 mm long; anther cap 2.3 × 1.7 mm, broadly ovate-cucullate, obtuse; pollinia four, seemingly forming two pairs, elongated and slightly narrowly ovate-falcate, flat, viscidium; each pair c. 1.98 × 0.64 mm. Fruit not seen. (Figs 1 & 2).

**Distribution and habitat:** Indonesia, Bird's Head Peninsula, in or near the North and the South Tamrau Mountains Nature Reserves. Endemic to the Tamrau Mountains. Epiphyte in primary lowland to lower montane, sometimes disturbed, rainforest, in humid and shaded positions at elevations of 400 to 1100 m asl.

**Phenology:** Flowering in September.

**Etymology:** The specific epithet *abuniorum* refers to a local tribe in Tambrau Regency, the Abun, who protect the North Tamrau Mountains Nature Reserve.

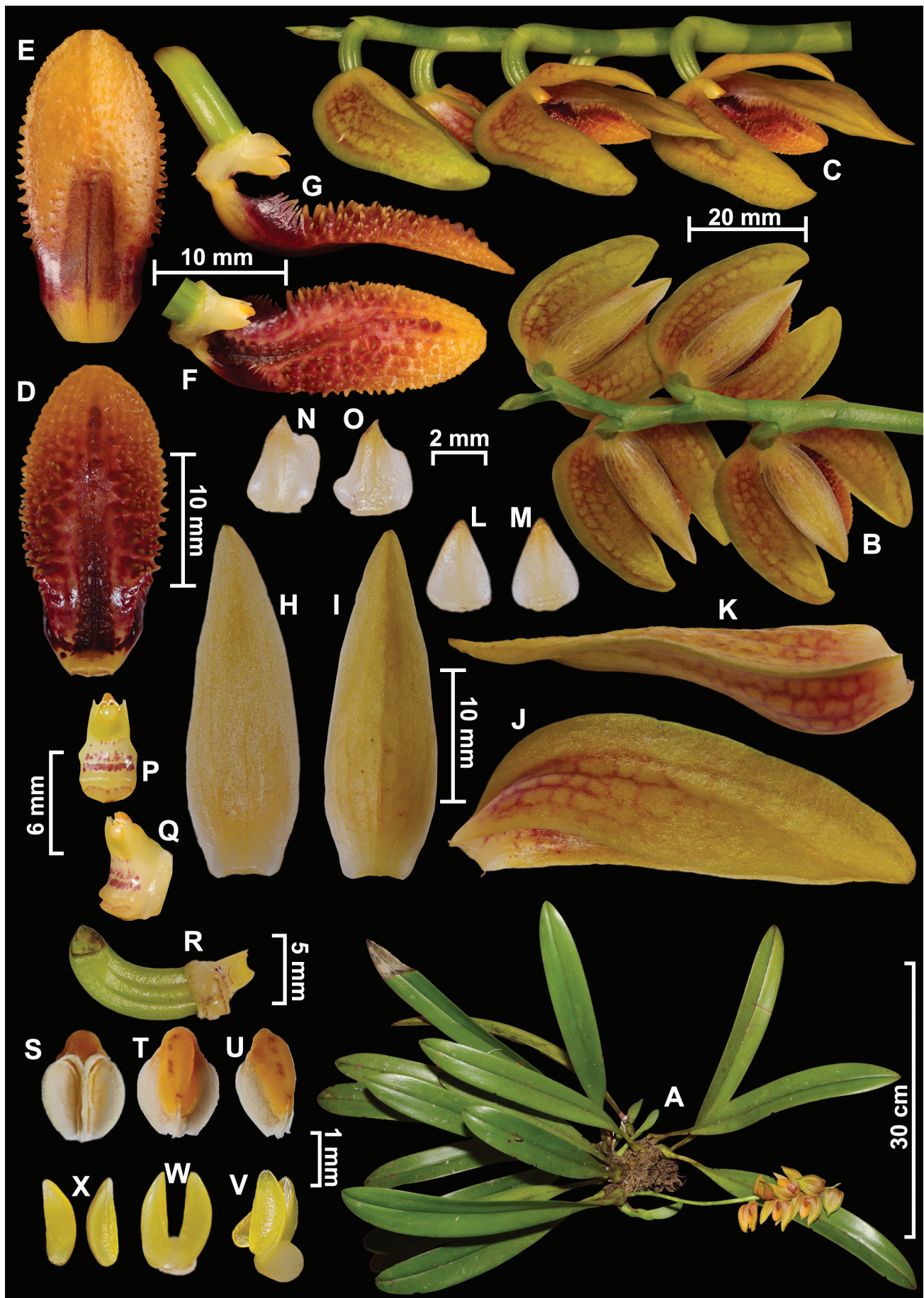
**Other specimen examined: Indonesia:** West Papua (Papua Barat) Province, Pegunungan Arfak Regency, South Tamrau Mountains Nature Reserve, 29 September 2024, A.D. Rajabsani s.n. (photo!).

**Conservation Status:** *Bulbophyllum abuniorum* is here assessed as Data Deficient (DD) according to the IUCN Standards and Petition Subcommittee criteria (2024). This species is distributed across several locations within the Bird's Head Peninsula, with confirmed populations in two areas: the buffer zone of North Tamrau Mountains Nature Reserve and within the South Tamrau Mountains Nature Reserve. These two locations are over 150 km apart.

The forests where this species was found show signs of disturbance due to local human activities, but extensive areas of undisturbed forest remain nearby. Additionally, *B. abuniorum* has been observed in private collections and in the orchid trade, but precise collection localities for these specimens are unknown. It is not known how widespread this species is in the Bird's Head Peninsula and what the population sizes are. Increased forest disturbance and illegal collecting could pose future threats.

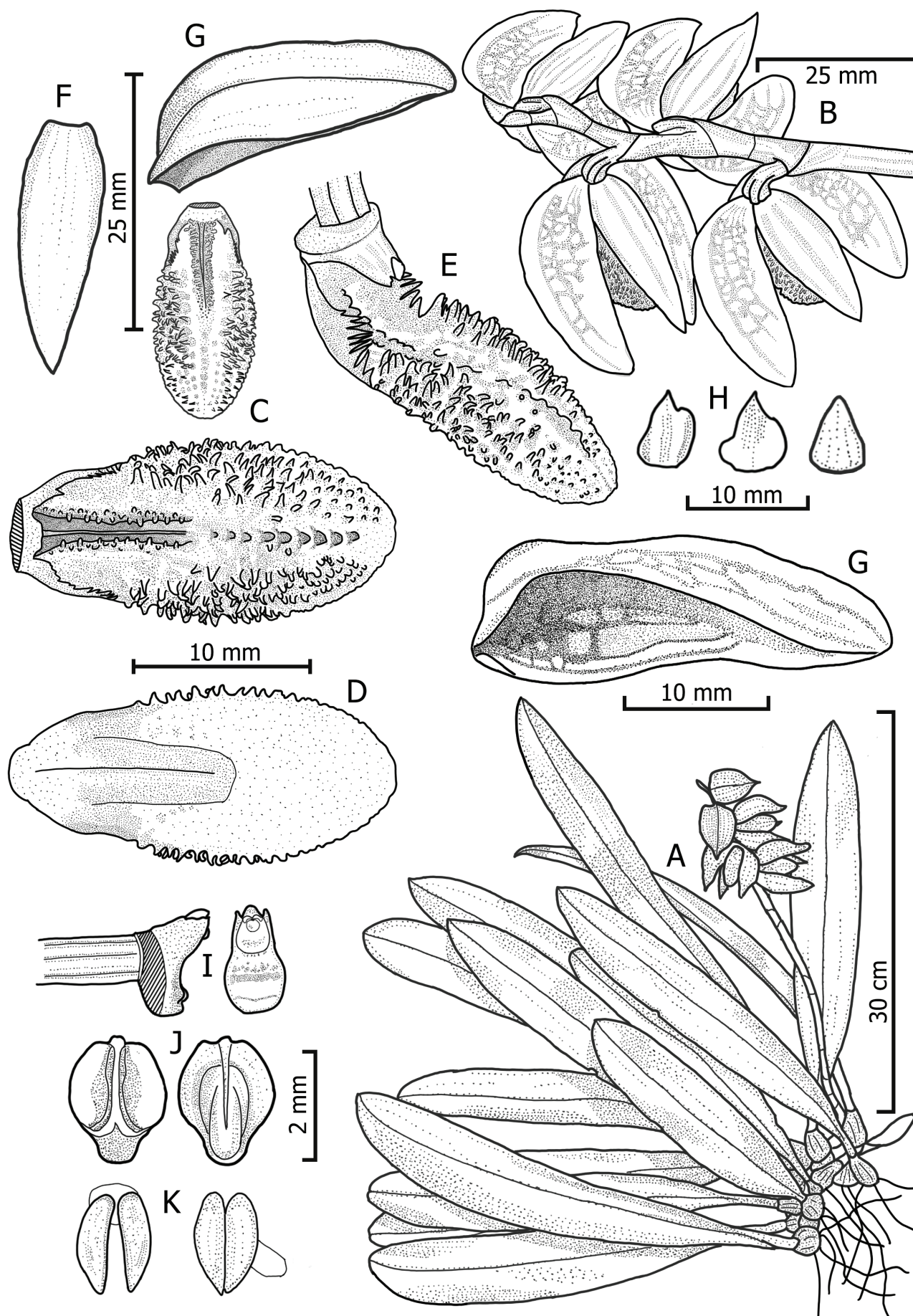
**Note:** There is a possibility that *Bulbophyllum abuniorum* also occurs in Morobe Province, Papua New Guinea, based on a specimen (Leiden cult. 20121174, collected by S.A. James 531 & D. Damas) documented by Eduard de Vogel (2024). This specimen shares several morphological similarities with *B. abuniorum*, although there are notable differences, such as petal shape and the basal margin of the lip. Accurate identification has been challenging because the Morobe specimen's flowers were not fully open, potentially causing some of these discrepancies. Additionally, observations suggest that petal shape in *B. abuniorum* can be variable, indicating a high degree of morphological plasticity in the flowers of this species.





**Figure 1.** Morphology of *Bulbophyllum abuniorum*. **A.** Plant with inflorescence. **B–C.** Inflorescence (above, side). **D–G.** Labellum (adaxial, abaxial, oblique, side). **H–I.** Dorsal sepal (abaxial, adaxial). **J–K.** Lateral sepal (side, adaxial). **L–M.** Petal (abaxial, adaxial). **N–O.** Uncommon shape petal (abaxial, adaxial). **P–R.** Column (ventral, oblique, side with pedicel). **S–U.** Anther cap (abaxial, adaxial, oblique). **V–X.** Pollinia. Photographs by Reza Saputra.





**Figure 2.** Botanical illustration of *Bulbophyllum abuniorum*. **A.** Plant with inflorescence. **B.** Inflorescence. **C–E.** Labellum (adaxial, abaxial, oblique). **F.** Dorsal sepal. **G.** Lateral sepal oblique view. **H.** Petals with different shapes. **I.** Column (side view with pedicel, ventral). **J.** Anther cap (abaxial, adaxial). **K.** Pollinia. Illustrated by Reza Saputra.

## Key to species of *Bulbophyllum* sect. *Lepidorhiza* in New Guinea

1. Inflorescence with only one or two flowers open at the same time; dorsal sepal not held parallel to the lateral sepals; lip less than half as long as the sepals; petals more than 11 mm long ..... 2
- 1: Inflorescence with 3 or more flowers opening simultaneously; dorsal sepal often held almost parallel with the lateral sepals; lip more than half as long as the sepals; petals c. 5–8 mm long ..... 6
2. Lip adaxial surface smooth ..... ***B. tritelidium***
- 2: Lip adaxial surface covered with teeth ..... 3
3. Lip with a pair of prominent keels from base to apex ..... ***B. oobulbum***
- 3: Lip with a pair of prominent keels from base to middle of lip ..... 4
4. Lip adaxial surface having teeth only from middle to apex ..... ***B. veldkampii***
- 4: Lip adaxial surface having teeth from base to apex ..... 5
5. Lip adaxial surface with sparse small teeth ..... ***B. exasperatum***
- 5: Lip adaxial surface densely covered with large conical teeth ..... ***B. odontoglossum***
6. Lip adaxial surface papillose in the middle; lip margin entire ..... ***B. levyae***
- 6: Lip adaxial surface densely covered with irregular conical-subulate teeth; lip margin lacinate at base, serrate to crenate towards apex ..... ***B. abuniorum***

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