

## ANATOMI DAN HISTOKIMIA DAUN SERTA BUNGA ANGGREK *Bulbophyllum devium* J.B. Comber DAN *Bulbophyllum gibbosum* (Bl.) Lindl

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### INTISARI

Anggrek termasuk dalam suku Orchidaceae yang merupakan suku terbesar dari tanaman berbunga, dengan lebih dari 880 marga dan 28000 jenis. *Bulbophyllum* Thouars. merupakan marga *pantropical* tumbuhan berbunga terbesar kedua di dunia, dengan jumlah jenis yang diketahui sekitar 2400. Mikromorfologi *Bulbophyllum* dari daerah tropis seperti Indonesia, belum banyak dipublikasikan. Oleh karena itu, dilakukan penelitian morfologi bunga, anatomi daun dan bunga, histokimia daun dan bunga serta kaitannya *pollination rewards* pada *Bulbophyllum devium* dan *Bulbophyllum gibbosum* section *Stachysanthes*. Penelitian ini bertujuan untuk mengetahui anatomi dan histokimia daun serta bunga *B. devium* dan *B. gibbosum*. Parameter yang digunakan yakni parameter anatomis, morfologis, dan kandungan kimia pada sepal, petal, dan labellum *B. devium* dan *B. gibbosum*. Hasil tersebut kemudian dibandingkan antara jenis *B. devium* dan *B. gibbosum*. Hasil yang diperoleh pada penelitian ini yaitu, bentuk sepal dorsal *B. devium* segitiga-oblong sedangkan *B. gibbosum* oblong, labellum *B. devium* lurus sedangkan *B. gibbosum* melengkung  $90^{\circ}$ , bentuk sepal lateral *B. devium* segitiga-oblong sedangkan *B. gibbosum* segitiga-oblong recurved. Anatomi kedua spesies memiliki perbedaan yakni adanya kalus serta kalsium oksalat rafida ( $18,30 \pm 0,47 \mu\text{m}$ ) pada labellum *B. devium*. Bentuk sel epidermis *B. devium* poligonal-rounded sedangkan *B. gibbosum* poligonal. Densitas sekretori (jumlah sel sekretori/ $\text{mm}^2$ ) permukaan adaksial *B. devium* yakni  $0,43 \pm 0,75$  dan abaksial  $2,04 \pm 1,07$  sedangkan *B. gibbosum* permukaan adaksial  $4,62 \pm 0,73$  dan abaksial  $3,76 \pm 1,36$ . Stomata kedua spesies hanya ditemukan pada permukaan abaksial dengan densitas *B. devium*  $37,53 \pm 4,25$  dan *B. gibbosum*  $64,73 \pm 6,92$ . Nukleus pada sel epidermis *B. devium* tampak sedangkan *B. gibbosum* tidak tampak. Anatomi irisan melintang daun *B. gibbosum* teramati adanya kalsium oksalat rafida dengan panjang  $6,73 \pm 0,38 \mu\text{m}$ , kutikula abaksial *B. devium* kasar dengan ketebalan  $19,77 \pm 1,96 \mu\text{m}$  dan kutikula adaksial  $22,90 \pm 3,63 \mu\text{m}$  sedangkan *B. gibbosum* halus dengan ketebalan  $10,59 \pm 1,03 \mu\text{m}$  dan kutikula adaksial  $9,25 \pm 2,14 \mu\text{m}$ . Hasil uji histokimia daun dan bunga, terdeteksi positif amilum, protein, lipid, kalsium oksalat, serta lignin pada jaringan sklerenkim dan xilem daun. Sepal lateral, sepal dorsal, petal serta labellum *B. devium* dan *B. gibbosum* mengandung amilum pada mesofil; mengandung lipid pada kutikula; mengandung kalsium oksalat pada epidermis, mesofil, dan sekitar jaringan pengangkut; mengandung protein pada mesofil, sekitar berkas pengangkut, dan epidermis.

Kata kunci : Anatomi, histokimia, mikromorfologi, *pollination rewards*

## ANATOMICAL AND HISTOCHEMICAL OF LEAVES AND FLOWERS IN ORCHID *Bulbophyllum devium* J.B. Comber AND *Bulbophyllum gibbosum* (Bl.) Lindl

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### ABSTRACT

Orchids belong to the Orchidaceae family, which is the largest family of flowering plants, with more than 880 genera and 28,000 species. *Bulbophyllum* Thouars is the second-largest pantropical genus of flowering plants in the world, with around 2,400 known species. The micromorphology of *Bulbophyllum* from tropical regions such as Indonesia has not been extensively published. Therefore, a study was conducted on the floral morphology, leaf and flower anatomy, histochemistry of leaves and flowers, and their relation to pollination rewards in *Bulbophyllum devium* and *Bulbophyllum gibbosum*, section *Stachysanthes*. This research aims to determine the anatomy and histochemistry of the leaves and flowers of *B. devium* and *B. gibbosum*. The parameters used were anatomical, morphological, and chemical content parameters in the sepals, petals, and labellum of *B. devium* and *B. gibbosum*. The results were then compared between the species *B. devium* and *B. gibbosum*. The results obtained in this study are as follows the dorsal sepal shape of *B. devium* is triangular-oblong, while that of *B. gibbosum* is oblong; the labellum of *B. devium* is straight, while that of *B. gibbosum* is curved at 90 degrees; the lateral sepal shape of *B. devium* is triangular-oblong, while that of *B. gibbosum* is triangular-oblong recurved. The anatomy of the two species has differences, including the presence of callus and calcium oxalate raphides ( $18.30 \pm 0.47 \mu\text{m}$ ) on the labellum of *B. devium*. The epidermal cell shape of *B. devium* is polygonal-rounded, while that of *B. gibbosum* is polygonal. The density of secretory cells (number of secretory cells/mm<sup>2</sup>) on the adaxial surface of *B. devium* is  $0.43 \pm 0.75$  and on the abaxial surface  $2.04 \pm 1.07$ , while for *B. gibbosum*, the adaxial surface is  $4.62 \pm 0.73$  and the abaxial surface is  $3.76 \pm 1.36$ . The stomata of both species are only found on the abaxial surface, with a density of  $37.53 \pm 4.25$  in *B. devium* and  $64.73 \pm 6.92$  in *B. gibbosum*. The nucleus in the epidermal cells of *B. devium* is visible, whereas in *B. gibbosum*, it is not visible. In the cross-section anatomy of *B. gibbosum* leaves, calcium oxalate raphides with a length of  $6.73 \pm 0.38 \mu\text{m}$  were observed. The abaxial cuticle of *B. devium* is rough with a thickness of  $19.77 \pm 1.96 \mu\text{m}$  and the adaxial cuticle is  $22.90 \pm 3.63 \mu\text{m}$ , while for *B. gibbosum*, it is smooth with a thickness of  $10.59 \pm 1.03 \mu\text{m}$  for the abaxial cuticle and  $9.25 \pm 2.14 \mu\text{m}$  for the adaxial cuticle. Histochemical tests on the leaves and flowers detected positive results for starch, protein, lipids, calcium oxalate, and lignin in the sclerenchyma and xylem tissues of the leaves. The lateral sepals, dorsal sepals, petals, and labellum of *B. devium* and *B. gibbosum* contain starch in the mesophyll; lipids in the cuticle; calcium oxalate in the epidermis, mesophyll, and around vascular tissues; and protein in the mesophyll, around vascular bundles, and epidermis.

Key words: Anatomy, histochemical, micromorphology, pollination rewards