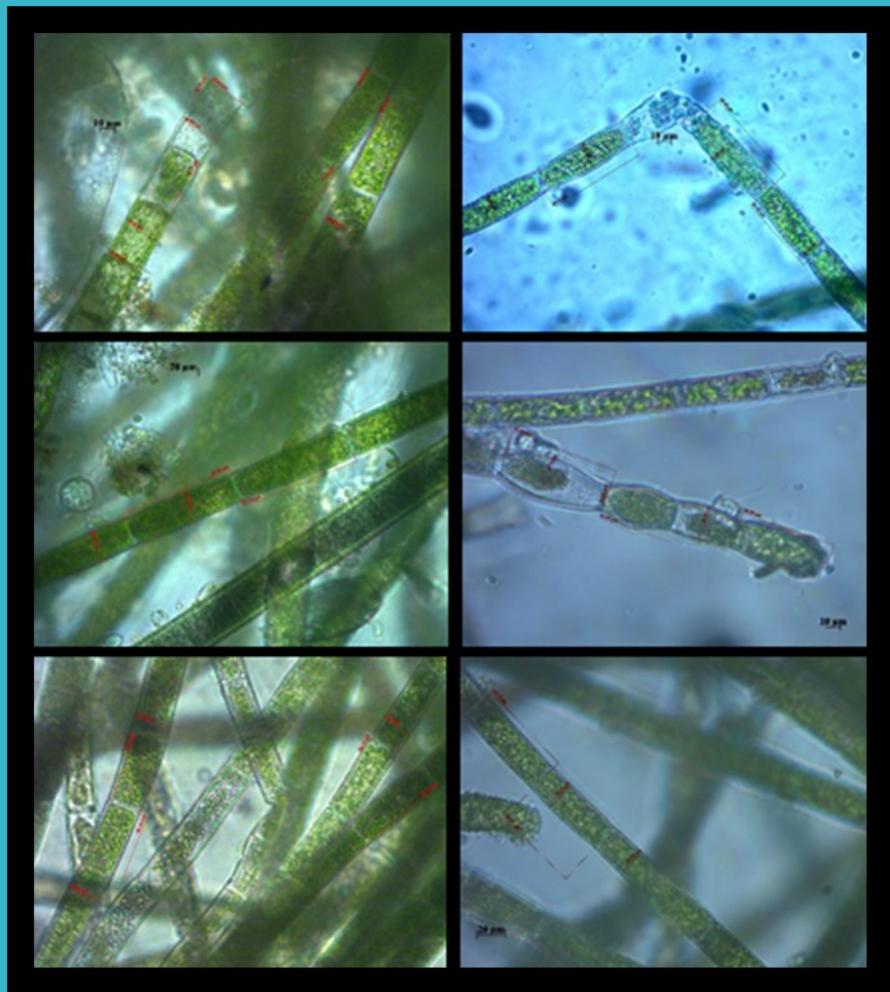


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Keterangan foto cover depan: Pertumbuhan *Oedogonium* sp. pada perlakuan cahaya yang berbeda. *Oedogonium* sp. Pada kultur Outdoor tampak lebih padat daripada kultur indoor, sesuai dengan halaman 309
(Notes of cover picture): (*Growth of Oedogonium* sp. at different light treatments. *Oedogonium* sp in outdoor culture appeared denser than in indoor culture, as in page 309)



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JAVANESE ENDEMIC STROBILANTHES (ACANTHACEAE): TAXONOMY, DISTRIBUTION AND CONSERVATION STATUS

[*Strobilanthes* Endemik Jawa (Acanthaceae): Taksonomi, Distribusi dan Status Konservasi]

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ABSTRACT

The taxonomic status of Javanese Strobilanthes has been revised by Bennett and Scotland (2003). However, the results of the validation of the Javanese Acanthaceae by Girmansyah (2014) show that several Strobilanthes species, especially those endemic to Java, need to be revised. Because they have become synonymous. Conservation status of Javanese endemic Strobilanthes was carried out according to the IUCN Red List Categories and Criteria.

Keyword: Conservation Status, Endemic, Javanese, Strobilanthes, Taxonomy

ABSTRAK

Status taksonomi Strobilanthes Jawa telah direvisi oleh Bennett and Scotland (2003). Akan tetapi, hasil validasi suku Acanthaceae Jawa oleh Girmansyah (2014) menunjukkan beberapa spesies Strobilanthes khususnya endemik Jawa perlu di revisi karena telah menjadi sinonim. Status konservasi Strobilanthes endemik Jawa dilakukan menurut Kategori dan Kriteria IUCN red list.

Kata Kunci: Endemik, Jawa, Strobilanthes, Status Konservasi, Taksonomi

INTRODUCTION

Strobilanthes Blume is a genus within Acanthaceae which is well known in the Malesian floristic region. It was first described by Blume in 1826 based on specimens collected in Java (Bennett and Scotland, 2003). The members of this group were very diverse, resulted in debate among botanists about its taxonomic status (Deng, 2020). Terao (1983) has proposed combining all recognized genera by Nees von Esenbeck (1832) and Bremekamp (1944). Unfortunately, Terao's publication was considered weak in the infra-generic analysis of classification when compared to Bremekamp's publication (1944) who divided the *Strobilanthes* into 58 allied genera with reference to Nees (1832, 1847). However, Terao's suggestion has been widely accepted in recent publications (Moylan *et al.*, 2004; Wood 2009; Deng *et al.*, 2010; Hu *et al.*, 2011; Deng and Gao 2017; Deng, 2020).

The group of *Strobilanthes* mostly herbs, shrubs or small trees, stems and branches mostly 4-angled, woody and hollow with age. Leaves opposite, petiolate or sessile, anisophyllous to isophyllous: lamina usually with cystoliths, ovate to elliptic, indumentum present or absent. Inflorescences

axillary and or terminal, grouped as spike, heads or panicles, rarely the flowers solitary; bract present, bracteole present or absent. Calyx 5-lobed. Corolla white, blue, violet or pink, resupinate or not, campanulate, infundibuliform or subventricose, 5-lobed. Stamens 4; filaments glabrous or pubescent. Ovary 2-locular, usually pubescent with glandular hairs or stalked glands. Style filiform, glabrous or pubescent. Fruit capsule (Bennett and Scotland 2003).

Strobilanthes was widely used in the health sector. Several species were known have anti-inflammatory, antimicrobial, antidiabetic, and anticancer properties (Nilanthi, 2019). However, Tsai *et al.* (2020) and Ismail *et al.* (2012) mentioned that extracts from most of the *Strobilanthes* have been used to treat respiratory problems caused by influenza viruses, hepatitis B virus, mumps virus, and severe acute respiratory syndrome (SARS), corona virus and used in spider poisoning, snake bites, cerebrospinal meningitis, and viral pneumonia.

A total of approximately 400 species spread across tropical and subtropical Asia (Backer and Bakhuizen 1968; Bennett and Scotland 2003; Mabberley 2005; Deng 2011; Mabberley 2017,).

*Kontributor Utama

*Diterima: 13 Oktober 2020 - Diperbaiki: 10 November 2020 - Disetujui: 15 Desember 2020

Backer and Bakhuizen (1968) recorded 10 species of *Strobilanthes* sensu Bremekamp (1944) occur in Java. Then, Bennett and Scotland (2003) revised *Strobilanthes* in Java into 25 species by reducing some of the genus sensu Bremekamp (1944) to be synonymous with *Strobilanthes*. Girmansyah (2014) validated the Acanthaceae group in Java and stated that there were 9 species of *Strobilanthes* native to Java. Girmansyah's results show that most of the species mentioned have changed their taxonomic status. Furthermore, the data related to the conservation status of native Javanese *Strobilanthes* according to IUCN RED LIST was not available.

For this reason, this study aims to update the information on Javanese endemic *Strobilanthes* such as the recent taxonomy status, habitat, distribution and assessment of conservation status according to IUCN LIST Categories and Criteria. The data related to distribution are presented in a distribution map for easy understanding.

MATERIALS AND METHODS

The research was conducted at the Herbarium Bogoriense, Botany Division, Research Center for Biology, Indonesian Institute of Sciences. The method used was to study/observed all Javanese *Strobilanthes* specimens in the Herbarium Bogoriense and also from other herbaria obtained

through the websites (JSTOR and GBIF). Furthermore, all the information listed on the specimen is recorded, such as scientific name, habitat and distribution. The data from the specimens were then validated to determine the latest taxonomic status by referring to updated publications and also several websites such as the Plant List, GBIF, Tropicos, IPNI, POWO, and JSTOR. Conservation status assessment follows the guidelines Category and Criteria according to the IUCN Red List version 13. Making a distribution map using a GIS program. Meanwhile, the literature search uses references available in the Herbarium Bogoriense library, as well as other sources obtained from trusted websites.

As part of the effort to protect the native flora of Java, information related to habitat location is not mentioned in this note. So that information related to location only uses provincial boundaries on the island of Java.

RESULT

Based on the observations of specimens at the Herbarium Bogoriense, it is known that there are 11 species of *Strobilanthes* endemic to Java. Following are the identification keys, taxonomic status and prediction of the conservation status of each species.

Strobilanthes alata Blume, Bijdr. 13: 798 (1826).

Key to Species

1. Corolla campanulate, length up to 20 cm.....	2
1. Corolla other shapes, length more than 20 cm.....	6
2. Habit shrub.....	3
2. Habit scandent perenial.....	<i>S. alata</i>
3. Corolla white.....	4
3. Corolla orange.....	<i>S. afriastiniae</i>
4. Lamina ovate.....	5
4. Lamina elliptic.....	<i>S. coertii</i>
5. Corolla length less than 20 cm.....	<i>S. koordersii</i>
5. Corolla length more than 20 cm.....	<i>S. autapomorpha</i>
6. Corolla white.....	7
6. Corolla purple.....	<i>S. stenura</i>
7. Leaf apex acuminate.....	8
7. Leaf apex acute.....	<i>S. winckelii</i>
8. Corolla infundibuliform.....	9
8. Corolla subventricose.....	10
9. Corolla length less than 46 cm.....	<i>S. warburgii</i>
9. Corolla length more than 46 cm.....	<i>S. involucrata</i>
10. Corolla white with yellow markings on the inside of the throat.....	<i>S. steenisiana</i>
10. Corolla white with veins marked in pale purple.....	<i>S. bibracteata</i>

Goldfussia paniculata Nees var. *alata* (Blume) Nees in DC., Prodr. 11: 175 (1847). Type: Indonesia, Java, Blume s.n. (lectotype: L).

Synonym: *Strobilanthes dicipteroides* Miq., Fl. Ind. Bat. 2: 802 (1858). Type: Indonesia. West Java: Mt Wayang, Junghuhn s.n. (lectotype: L).

Scandent perennial up to 2.5 m tall. Leaves anisophyllous, lamina 40–80 × 20–66 mm, elliptic to widely elliptic, apex acuminate, margin serrulate, base decurrent, glabrous to almost pubescent; Lateral veins pubescent. Inflorescence of 3–5-flowered iso-dimensional or shortly elongate heads. Corolla pinkish, campanulate, 16–24 mm long, outside glabrous or occasionally densely pubescent; corolla tube cylindrical; stamens glabrous, posterior pair 2–5 mm long; style 25 mm long, glabrous; ovary glabrous. Fruit capsule.

Habitat: Primary forest, a scrambling shrub growing through other plants. Alt. 160–2100 m.

Distribution: West Java: Central Java, and East Java. Conservation status: The extent of occurrence (EOO) of *S. alata* is 41,018.949 km², which would give it the status of Near Threatened. The area of occupancy (AOO) was estimated at 64 km², which is less than the 500 km² thresholds of the B2 criterion of the Endangered category. Considering that *S. alata*'s habitat located in more than five locations, occurs in Natural Reserve areas and also National Parks such as Mt. Gede, Mt. Papandayan, Mt. Ciremai, Mt. Ijen and Mt. Tengger *S. alata* is assessed here as Least Concern (LC).

Specimens examined: C. A. Backer 2615, 26186 (BO); C. G. G. J. van Steenis 6771, 6791, 6439, 12788 (BO); J. H. Kern 7736 (BO); C. Holstvoogd 194 (BO); R. Brinkman 678 (BO); Dr. Posthumus s.n. (BO); J.J. Smith 407 (BO); W. Meijer 2858 (BO); Konstermans 23004 (BO); Merr van Harreveld 99 (BO); J.R. Bennet JRB 30 (BO); de Monchy 119 (BO); Smith and Rant 267 (BO); Docters van Leeuwen-Rejnvaan s.n. (BO); Indij 66, 177, 224 (BO); Mej. Sluiter 1916. (BO); Forbes 719 (BO); Dr. R. Scheffer s.n. (BO).

Strobilanthes afriastiniae R. Benn. Kew Bulletin. 58 (1):1-82 (2003). Type: Indonesia, Central Java, Mt

Lawu, Afriastini 480 (holotype K, isotype A, BO, L, P).

Shrubs up to 2 m tall. Stems and branch pubescent. Leaves anisophyllous, lamina 25–126 × 16–77 mm, ovate to widely ovate, densely pubescent, margin crenate, apex acute or acuminate, base decurrent; lateral veins densely pubescent. Inflorescence of dense axillary heads or short spikes. Corolla orange or whitish orange, c. 14 mm long, campanulate, outside glabrous, inside pubescent; corolla tube cylindrical; stamens glabrous, posterior pair c. 1 mm long; style 14 mm long, glabrous; ovary comose, pubescent. Fruit capsule.

Habitat: Open fagaceous forest, growth in shadow place on quercus forest. Alt. 2700 m.

Distribution: East Java.

Conservation status: Information about *S. afriastiniae* only known from type locality. Moreover, there is possible threat such as forest fire last year. So we assessed as Critically Endangered B2ac iii, iv.

Specimens examined: J.J. Afriastini 280, 480 (BO).

Strobilanthes coertii Terao ex J. R. Benn. Kew Bulletin. 58 (1):1-82 (2003). *Gymopsis polystachya* Bremek, in Proc. Kon. Ned. Akad. Wetensch. C 60: 12 (1957). Type: Indonesia. East Java: Sarangan, Coert 665 (holotype, L).

Habit unknown. Leaves anisophyllous, lamina 115–190 × 40–90 mm, elliptic to narrowly ovate, apex acute, margin serrate, base decurrent, pubescent, below with sessile glands; indumentum at lateral veins. Inflorescence axillary, usually unbranched spikes up to 60 mm long. Corolla white, 18 mm long, campanulate, outside pubescent; corolla tube cylindrical; stamens glabrous, posterior pair 3 mm long; style 18 mm long, glabrous; ovary apex hairy. Fruit capsule.

Habitat: Alt. 1200 m.

Distribution: East Java.

Conservation status: Information about *S. coertii* only known from type locality. Refer to the criteria of the IUCN Red List, *S. coertii* should be listed as Data Deficient (DD). Moreover, the area around type habitat is now used for a tourist site. So we assessed as Critically Endangered B2ac iii, iv.

Specimen examined: Coert 665 (L).

Strobilanthes koordersii C. B. Clarke ex Koord., Exkurs.-Fl. Java 3: 218 ((1912). *Parastrobilanthes koordersii* (C. B. Clarke ex Koord.) Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 41: 293 (1944). Types: Indonesia, East Java, Koorders 37309, 37312, 38153 (syntype BO (n.v.)), 37310 (syntype L).

Shrub up to 3 m. Leaves anisophyllous, lamina 11–170 × 8–80 mm, ovate to narrowly ovate, apex shortly acuminate, margin dentate or dentate-serrate, base of larger leaves decurrent, of smaller leaves cordate glabrous above, pubescent below; lateral veins glabrous. Inflorescence of heads or short spikes up to 15 mm long; corolla white, 11.5–18 mm long, campanulate, glabrous outside; corolla tube cylindrical; stamens glabrous, posterior pair unequal in length, 1.5 mm and 2 mm long; style 17 mm long, glabrous; ovary glabrous. Fruit capsule.

Habitat. Alt. 2000–2500 m.

Distribution: East Java.

Conservation status: The extent of occurrence (EOO) of *S. koordersii* is 1,281.564 km², which would give it the status of Endangered. The area of occupancy (AOO) was estimated at 64 km², which is less than the 500 km² thresholds of the B2 criterion of the Endangered category. Considering that *S. koordersii*'s habitat in Natural Park and Nature reserve area, *S. koordersii* is assessed here as Least Concern (LC).

Specimens examined: Docters van Leeuwen-Reijnvaan 12340 (BO); C. G. G. J. van Steenis 1190, 7196 (BO); Kobus 257 (BO).

Strobilanthes autapomorpha J. R. Benn. Kew Bulletin. 58 (1):1-82 (2003). Type: Indonesia. Central Java: Diyeng, Kuntze 5764 (Lectotype NY; isolectotypes K, NY).

Shrubs up to 2 m tall. Leaves anisophyllous, lamina 35–100 × 25–70 mm, narrowly to widely ovate, pubescent above, densely so below, margin crenate or crenate-serrate, apex acuminate, rarely acute, base weakly asymmetrical, cordate or shortly decurrent; lateral veins glabrous. Inflorescences of axillary iso-dimensional 10–14-flowered heads. Corolla white, 22–25 mm long, campanulate,

outside glabrous, inside pubescent; corolla tube cylindrical; stamens pubescent in lower half, posterior pair 2.5–3 mm long; style 10–17 mm long, glabrous; ovary apex comose. Fruit capsule. Habitat: Alt. 1000–2500 m.

Distribution: East Java and Central Java.

Conservation status: The extent of occurrence (EOO) of *S. autapomorpha* is 4,536.473 km², which would give it the status of Endangered. The area of occupancy (AOO) was estimated at 24 km², which is less than the 500 km² thresholds of the B2 criterion of the Endangered category. Considering that *S. autapomorpha*'s habitat located at unpopulations areas and also at Natural Parks namely Mt. Slamet, *S. autapomorpha* is assessed here as Least Concern (LC).

Specimens examined: J. R. Bennett JRB52 (BO); Arief Hidayat AH5411 (BO); J. H. Coert 378 (BO); C. A. Backer 434 (BO); Teysmann sn. (BO); S.H. Koorders 28058, 43605 (BO); Dansen 6603 (BO); Shuji Yoshida 1821 (BO); H. Altman 356 (BO); Dr. O. Posthumus 382, 3954 (BO); Mousset 712 (BO); C. G. G. J. Van Steenis 11852, 10808, 11619, 7311 (BO); J. Loogen sn. (BO); A. Rant sn. (BO); J.c.V.d. Winckel 383 (BO); Docters van Leeuwen-Reijnvaan 2793 (BO); G. H. Coert 34/34 (BO); E. Jacobson sn. (BO); P.D. Monchy 26 (BO); R. Brinkman 413, 749 (BO).

Strobilanthes stenura (Bremek.) J. R. Benn. Kew Bulletin. 58 (1):1-82 (2003). *Microstrobilos stenurus* Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 45(2): 12 (1948). Type: Indonesia. Central Java: Mt Prahoe, Loogen 7 (holotype BO; isotype L).

Habit unknown. Leaves anisophyllous, lamina 29–140 × 12–53 mm, ovate to narrowly ovate, apex strongly acuminate, margin shallowly dentate to subentire, base decurrent, glabrous, occasionally glandular below; lateral veins glabrous. Inflorescence of many-flowered elongate heads. Corolla purple, 22 mm long, subventricose, glabrous outside, corolla tube cylindrical; stamens glabrous, posterior pair 3 mm long; style 20 mm long, glabrous; ovary glandular. Fruit capsule.

Habitat: Alt. 1000–2400 m.

Distribution: Central Java.

Conservation status: The area of occupancy (AOO) was estimated at 8 km², which is less than the 500 km² thresholds of the B2 criterion of the Critical Endangered category. Considering that *S. stenura*'s habitat located in less than five locations, one of them is a National park namely Mt. Slamet. *S. stenura* is assessed here as Endangered: EN B2ab (i.ii. iii. iv)c(ii.iii).

Specimens examined: C. A. Backer 402 (BO); Loogen s.n. (BO); Gen Murata et all 965, 965 (BO).

Strobilanthes winckelii (Bremek.) J. R. Benn. Kew Bulletin. 58 (1):1-82 (2003). *Ctenopaepale winckelii* Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 41: 249 (1944). Type: Indonesia. West Java: Tjadas Malang, 5 June 1917, Winckel s.n. (holotype L).

Habit unknown (there is no information about the habit of this species based on type collection). Leaves petiolate, lamina 41–62 × 21–35 mm, widely elliptic, apex acute, margin crenate-sinose, base decurrent, glabrous; lateral veins below pubescent. Inflorescence of 2– 6-flowered lax heads, sessile in the axils of leaves. Corolla white, 22–24 mm long, subventricose shape, outside glabrous; corolla tube cylindrical; stamens: filaments glabrous, posterior pair 0.8 mm long; stylus 14 mm long, pubescent in lower half. Fruit capsule.

Habitat: Alt. 1000 m.

Distribution: West Java, East Java.

Conservation status: Information about *S. winckelii* is only known from the type locality. The habitat is unknown and located in nature conserve area, *S. winckelii* is assessed here as Data Deficient (DD).

Strobilanthes warburgii Terao ex J. R. Benn. Kew Bulletin. 58 (1):1-82 (2003). *Pachystrobus hirsutus* Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 41: 225. Type: Indonesia. Java: Leg. ign. s.n. (holotype L).

Habit: unknown. Leaves anisophyllous, lamina 68–166 × 8–57 mm, narrowly ovate or elliptic, apex acuminate, margin serrate, base decurrent,

pubescent; lateral veins densely pubescent. Inflorescence of 4–6-flowered dense heads borne on axillary side shoots. Corolla white, infundibuliform, 39–46 mm long, glabrous outside; corolla tube cylindrical; stamens subglabrous, posterior pair 5 mm long; style 42 mm long, sparsely pubescent; ovary glabrous. Fruit capsule.

Habitat: Unknown.

Distribution: West Java.

Conservation status: Information about *S. warburgii* only known from type locality. Moreover, there is no information about its current status or possible threat. So we assessed as Data Deficient (DD).

Strobilanthes involucrata Blume Bijdr. 13: 799 (1826). *Pachystrobus involucratus* (Blume) Bremek., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 41: 224 (1944). Type: Indonesia. West Java: Mt Seribu, Blume s.n. (lectotype, L; isolectotype, BO)

Synonym: *Strobilanthes erosa* Nees in DC., Prodr. 11: 180 (1847). Type: Indonesia. Java: Zollinger 2027. (lectotype G-DC; isolectotypes A, BM, G).

Strobilanthes involucrata Blume var. *beta* Blume. Bijdr. 13: 799 (1826). Type: Indonesia. Java: Blume s.n. (lectotype L).

Strobilanthes involucrata Blume var. *genuinus* Hochr., Candollea 5: 227 (1934). Type: Indonesia. WestJava: Mt Salak, 14 March 1904, Hochreutiner 1720 (syntypes G, L).

Strobilanthes involucrata Blume var. *tjibodensis* Hochr., Candollea 5: 227 (1934). Type: Indonesia. West Java: Cibodas Botanic Garden, 23 Aug. 1903, Hochreutiner 37 (syntypes G, L, MO, UC).

Shrub up to 7 m tall. Stem glabrous, brances sligly pubescent. Leaves anisophyllous, lamina 21–155 × 17–65 mm, elliptic to narrowly ovate, apex acuminate,margin serrate, base decurrent, glabrous or pubescent; lateral veins glabrous or pubescent. Inflorescence dense heads borne in the axils of unbranched or branched stalk. Corolla white, infundibuliform, 45–51 mm long, outside glabrous, inside pubescent at the mouth; corolla tube cylindrical; stamens glabrous, posterior pair 5 mm

Table 1. List of *Strobilanthes* species in Java revised by Bennett and Scotland (2003) [Daftar spesies *Strobilanthes* di Jawa direvisi oleh Bennett dan Skotlandia (2003)]

No.	Species (Spesies)	Distributions (Distribusi)
1.	<i>Strobilanthes hamiltoniana</i>	East Himalaya from East Nepal to northern Thailand (Chiang Mai) and south-west China (Yunnan), naturalised in Indonesia (Java), Malaysia (Sabah) and Sri Lanka. Bali, Java, Sulawesi
2.	<i>S. filiformis</i>	Java, Sumatra
3.	<i>S. pedunculosa</i>	Indonesia (Flores, Java, Sumbawa), Philippines
4.	<i>S. boholensis</i>	Java
5.	<i>S. axilliflora</i>	Java
6.	<i>S. winckelii</i>	Java
7.	<i>S. bibracteata</i>	Java
8.	<i>S. steenisiana</i>	Java
9.	<i>S. involucrata</i>	Java
10.	<i>S. warburgii</i>	Indonesia (Java, Sumatra), China, Malaysia, Myanmar, Thailand.
11.	<i>S. speciosa</i>	Native to north-east India, naturalised in Indonesia (Java).
12.	<i>S. glomerata</i>	Indonesia (Bali, Java, Sumatra), Laos, Malaysia, Myanmar, Thailand.
13.	<i>S. paniculata</i>	Java
14.	<i>S. alata</i>	Java
15.	<i>S. stenura</i>	Indonesia (Java), Myanmar, Thailand, Cambodia
16.	<i>S. moschifera</i>	Java, Sumatra
17.	<i>S. glandulosa</i>	Indonesia (Java), Myanmar, Thailand, Vietnam, Cambodia, China
18.	<i>S. repanda</i>	Java
19.	<i>S. koordersii</i>	Java
20.	<i>S. coertii</i>	Bali, Java, Sulawesi
21.	<i>S. backeri</i>	Java
22.	<i>S. cernua</i>	Java
23.	<i>S. autapomorpha</i>	Java, Sumatra
24.	<i>S. parabolica</i>	Java
25.	<i>S. afriastiniae</i>	

long; style 34 mm long, pubescent; ovary glabrous or pubescent. Fruit capsule.

Habitat: Alt. 300–2200 m.

Distribution: West Java and Central Java.

Conservation status: The extent of occurrence (EOO) of *S. involucrata* is 36,580.129 km², which would give it the status of Near Threatened. The area of occupancy (AOO) was estimated at 44 km², which is less than the 500 km² threshold of the B2 criterion of the Endangered category. Considering that the habitat of this species is located in more than five locations and also occurs in National Parks such as Mt. Salak, Mt. Tangkuban Prahu, Mt. Halimun, Mt. Gede, Ujung Kulon, Mt. Slamet and Mt. Ijen, *S. involucrata* is assessed here as Least Concern (LC).

Specimens examined: Tw sn. (BO); C. A. Backer

9145, 12417, 12890, 385, 12479, 10791 (BO); Elizabet A. Widjaja 3247 (BO); W. Meyer 2836; S. H. Koorders 20806 (BO); Arief Hidayat AH 5406 (BO); van Slooten 2593 (BO); Valeton sn. (BO); D. R. Pleyte 31 (BO); Dr. R. Scheffer 65 (BO); Ch. Coster 95 (BO); Scheffer sn. (BO); Bennet J. R. JRB 41 (BO); J. J. Smith sn. (BO); W.S.Hoover et all 818 (BO); Nengah Wirawan 253 (BO); Mej. Sluiter sn. (BO); Soegeng Reksodiharjo 16, 175 (BO); de Monchy 123 (BO); Dr. R. Scheffer sn. (BO); W. S. Hoover and D. Girmansyah 31894 (BO); W. S. Hoover 30761 (BO); W. S. Hoover et al. 30761 (BO); W. S. Hoover and M. Hendra 32573 (BO); Nurdin 8098 (BO); J.A. Lorzing 1441, 1349 (BO); C. G. G. J. van Steenis 1853, 6949, 2146 (BO).

Strobilanthes steenisiana J. R. Benn. Kew Bulletin.

Table 2. List species of Native Java *Strobilanthes* based on Validation by Girmansyah (2004) (W= West Java; C= Central Java; E= East Java) (*Daftar spesies Strobilanthes Jawa Asli berdasarkan Validasi oleh Girmansyah (2004)* (W = Jawa Barat; C = Jawa Tengah; E = Jawa Timur)

No.	Species (<i>Spesies</i>)	Distributions (<i>Distribusi</i>)
1.	<i>Strobilanthes boerlagei</i> Bremek.	W
2.	<i>S. cernua</i> Blume	W
3.	<i>S. filiformis</i> Blume	W,C,E
4.	<i>S. lawangensis</i> Bremek	E
5.	<i>S. prahuensis</i> S. Moore	W
6.	<i>S. prianganensis</i> Bremek.	W
7.	<i>S. repanda</i> (Blume) J.R. Benn.	W
8.	<i>S. slamatensis</i> Bremek	C,S
9.	<i>S. speciosa</i> Blume	C,E
10.	<i>S. winckelii</i> (Bremek.) J. R. Benn.	W

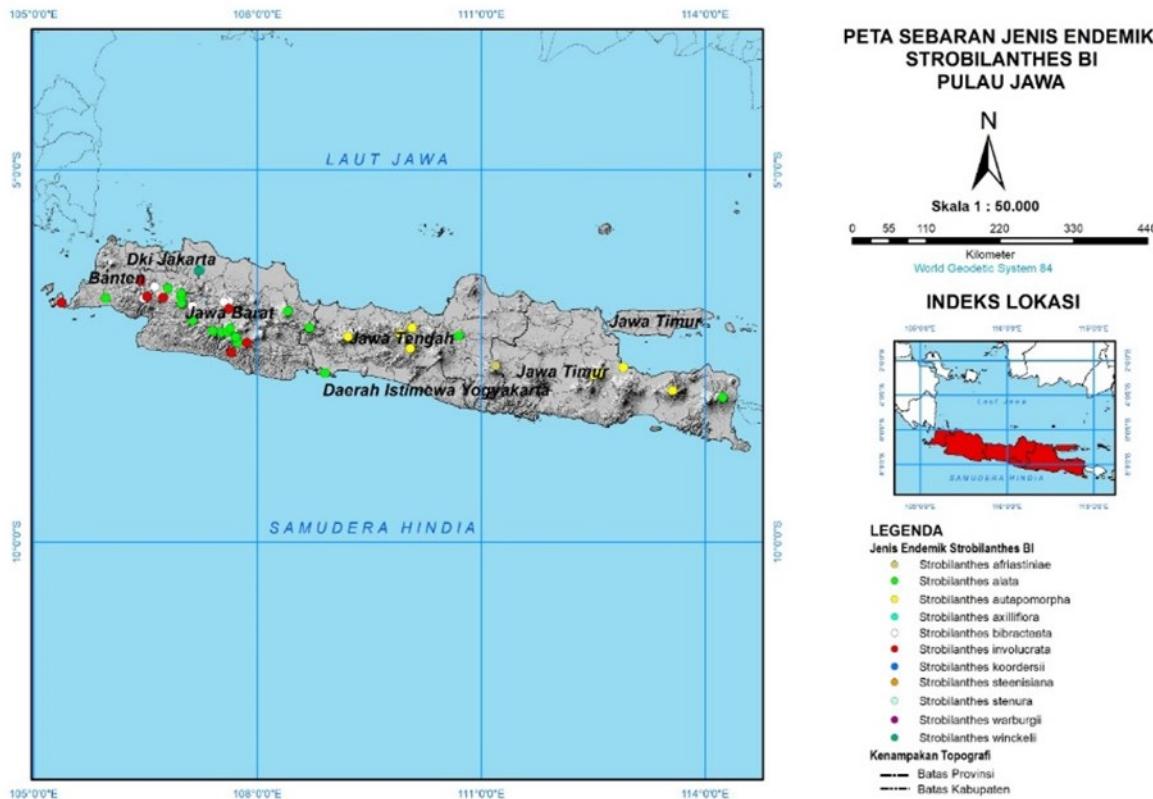


Figure 1. The distribution map of Javanese endemic *Strobilanthes* (created by Elvira Isir) [*Peta sebaran Strobilanthes endemik Jawa* (dibuat oleh Elvira Isir)]

58 (1):1-82 (2003). Type: Indonesia. Central Java: Mt Slamat, 27 Oct. 1998, Bennett 53 (holotype BO; isotypes FHO, K, L).

Shrub up to 20 m tall. Leaves anisophyllous, lamina 82–150(–175)×35–75(–190) mm, ovate to narrowly ovate, rarely elliptic, glabrous or sparsely pubescent, apex acuminate, margin subentire to weakly serrate, base decurrent; lateral veins pubescent. Inflorescence of dense heads of 4–6 flowers. Corolla white with yellow markings on the inside of the throat, subventricose, 53 mm long, glabrous outside; corolla tube cylindrical; stamens: glabrous, posterior pair 4 mm long; style: 38 mm long, densely pubescent; ovary glabrous. Fruit capsule.

Habitat: Shaded primary forest 900 m.

Distribution: Central Java.

Conservation status: Information about *S. steenisiana* is only known from the type locality. Refer to the criteria of IUCN Red List, *S. steenisiana* should be listed as Data Deficient (DD). The habitat is well known and located near populated areas. So, there are plausible threats to *S. steenisiana*'s populations. It is assessed here as Critically Endangered B2acii, iii, iv.

Strobilanthes vibracteata Blume, Bijdr. 13: 799 (1826). *Goldfussia vibracteata* (Blume) Nees in DC., Prodr. 11: 174 (1847). Type: Indonesia. West Java: Mt Salak, Blume 1802 (lectotype L, isolectotypes G, L).

Shrubs, 1–3 m tall. Leaves anisophyllous, lamina 43–90 × 19–29 mm, narrowly ovate to lanceolate, apex acuminate, margin serrate, base decurrent, glabrous to sparsely pubescent; lateral veins glabrous. Inflorescence of axillary dense heads of 4–6 flowers. Corolla white with veins marked in pale purple, 30–37 mm long, subventricose, glabrous outside; corolla tube cylindrical; stamens: filaments densely pubescent, posterior pair 3 mm long; style: 20 mm long, with a dense fringe of eglandular hairs; ovary glabrous. Fruit capsule.

Habitat: Alt. 700–2000 m.

Distribution: West Java.

Conservation status: The extent of occurrence (EOO) of *S. vibracteata* is 3,195.467 km², which

would give it the status of Least Concern. The area of occupancy (AOO) was estimated at 36 km², which is less than the 500 km² thresholds of the B2 criterion of the Endangered category. Considering that the habitat of this species is located in more than five locations and also occurs in National Parks such as Mt. Salak, Mt. Tangkuban Prahu, Mt. Halimun, and Mt. Gede, *S. vibracteata* is assessed here as Least Concern (LC).

Specimens examined: W.S. Hoover, D. Girmansyah and J. Hunter 32213, 32075, 32001, 32310, 31952, 32248 (BO); H. Wiradinata, W.S. Hoover and J. Hunter 31343 (BO); S. H. Koorders 15027, 39522, 39439 (BO); C. A. Backer 10216, 25027, 25847, (BO); R. C. Bakhuizen v/d Brink 620 (BO); D. Arifiani, A. Hidayat, Oiddi and Wardi DA 83 (BO); J.R. Bennet JRB 46 (BO); H. J. Lam 2211 (BO); Docters van Leeuwen Rejnvaan 11493 (BO); J.J.S. et. Rant 599 (BO); W. Soegeng Reksodiharjo 32A (BO); W.S. Hoover, A. Sadeli and Hunter 30, 357 (BO); H. Altman 357 (BO); van Slooten 316 (BO); C. G. G. J. van Steenis 12446 (BO); Dr. C. Coster sn. (BO).

DISCUSSION

1. The history of Javanese *Strobilanthes* Taxonomy

Since it was first described by Blume (1826), several species of Javanese *Strobilanthes* have been revised more than 2 times until finally revised by Bennett and Scotland (2003). Furthermore, several allied genus were mentioned in Backer and Bakhuizen (1968) such as *Hemigraphis* needs to be revised to clarify its taxonomic status.

The revision of Javanese *Strobilanthes* was first carried out by Nees (1847) who transferred three species of Javanese *Strobilanthes*, namely *S. vibracteata*, *S. paniculata*, and *S. filiformis* described by Blume (1826) into the *Goldfussia* genus. The *Goldfussia* is one of 8 allied genera of *Strobilanthes* described by Nees (1832) through specimens from the Himalayas. However, Miquel (1858) restored the taxonomic position of the three Javanese *Strobilanthes* which Nees moved through his publication in Flora Van Nederlandsch Indie.

Kuntze (1891) published a genus on the Acanthaceae in Java which was named

Lamiacanthus Kuntze based on specimens collected during his expedition in Java in 1975. Furthermore, it was revised to *Strobilanthes* by Backer (1938) without synonymizing species until clarified by Bennett and Scotland (2003) who makes it a synonym of *S. cernua*.

Referring to the *Strobilanthes* sensu Nees (1832, 1847), Bremekamp (1944) criticized Miquel's (1958) revision. Bremekamp revised and increased the number of allied genus of *Strobilanthes*. Bremekamp's revision was then followed by Backer and Bakhuizen (1968) and Nisyawati and Mustaqim (2017). Unfortunately, the results of Bremekamp's revision have drawn criticism, where allied genera described were often unclear and linked to one another (Wood 1994; Wang and Blackmore 2003). In addition, Backer and Bakhuizen (1968) and Steenis (1972) also concerned about the determination of species boundaries by Bremekamp.

Research conducted by Carine and Scotland (1998, 2000, 2002) shows that the allied genera described by Bremekamp should be included in *Strobilanthes*. By this reference, Bennett and Scotland (2003) revised the Javanese *Strobilanthes*. Their current research results are strengthened by DNA sequence data conducted by Moylan *et al.* (2004) and pollen morphological observations by Terao (1982, 1983) and Wang and Blackmore (2003).

In recent, Girmansyah (2014) validated the Acanthaceae group on the island of Java. Based on the results mentioned, it is known that the validation results on *Strobilanthes* still refer to Backer and Bakhuizen (1968). Although the 2 species mentioned have referred to Bennett and Scotland (2003). The 5 species mentioned, namely *S. boerlagei*, *S. lawangensis*, *S. prahuensis*, *S. prianganensis* and *S. slamatensis* have changed their status to become synonym of *S. cernua*. In addition, the native status of *S. cernua*, *S. filiformis*, *S. repanda*, and *S. speciosa* have changed. Their distribution occur outside Java also (Bennett and Scotland 2003).

Bennett and Scotland (2003) stated that 12 species of *Strobilanthes* native in Java (Table 1). However, the specimen tracing results showed that

the total native *Strobilanthes* in Java is only 11 species. *S. axilliflora*, which Bennett and Scotland (2003) mentioned as a native Javanese species, was not. Its distribution is known to the island of Sumatra based on specimens collected by W. J. J. O. de Wilde and B. E. E. de Wilde Duyfjes 12219. The specimen was identified by Terao as *S. axilliflora* through pollen observation.

Furthermore, GBIF as a source of scientific information uses *alatus* as an epithet for the name of the species *S. alata*. Based on personal discussions with J. R. Scotland and J. Wood, it was found that the epithet of name was not in accordance with the scientific writing rules of a plant systematic. Referring to the word of *Strobilanthes*, the genus's name is a feminine syllable. Thus, the syllable of the epithet name must not end in s. Therefore, the correct of epithet name is *S. alata*.

2. Habitat and Distribution

Information on native *Strobilanthes* habitat in Java is very little. Because most of the specimen labels only described the altitude of the location where the Javanese Native *Strobilanthes* grows. Based on the location information from the specimens, the habitat of *Strobilanthes* is referred to in Steenis (1972) and Kartawinata (2010).

In terms of ecological characteristics, Javanese native *Strobilanthes* can be grouped into three. The first group is mesotherm ecology that is the species that grows at an elevation of 1000–2500 m asl. At this elevation there are 3 vegetation zones, namely: a. Submontane zone (1000–1500 masl) characterized by tall tree-covered forest and poor in moss; consisting of *S. axilliflora*, *S. winckelii*, and *S. coertii*. b. Montana Zone (1600–2400 masl) characterized by tall tree-covered forest with smaller trunk diameters and more moss; consists of *S. koordersii*. c. Subalpin zone (2500–4000) characterized by dense low forest with tall, solitary trees, often mossy or coniferous; consists of *S. koordersii*. Furthermore, the location of *S. afriastinia*, *S. warburgii*, and *S. coertii* was mentioned, while the elevation was not. In accordance with the theory put forward by Steenis (1972) who states that the permanent zone of

Javanese mountain flora is at an elevation of 2400 – 3000. Meanwhile, the locations of *S. afriastiniae* and *S. warburgii* is above 2300 masl. So we predict the habitat of *S. afriastiniae* and *S. warburgii* to be in this zone, namely the subalpine zone. As for *S. coertii*, we placed it in the submontane zone because it located at an altitude of 1200 masl. The second group is ecological megatherm, that is the species that grows at an elevation of 0–1000 masl. In this group there is only 1 species, namely *S. steenisiana* which grows at an elevation of 900 m asl that included in the tropical vegetation zone. The third group is a group that is both megatherm and mesothermic ecology, consisting of *S. involucrata*, *S. bibracteata* and *S. alata*.

The distribution of Javanese native *Strobilanthes* is as follows: *S. involucrata*, *S. autapomorpha*, and *S. alata* are occurred in West Java, Central Java and East Java. *S. winckelii* occur in West Java and East Java. *S. bibracteata* and *S. warburgii* occurred only in the West Java region. *S. steenisiana*, and *S. stenura* are distributed only in the Central Java region. *S. koordersii*, *S. coertii*, and *S. afriastiniae* occurred only in the East Java region.

3. Conservation Status

Based on a search on the IUCN Red List website, it is known that all species of Javanese endemic *Strobilanthes* have not been assessed for their conservation status. For this reason, we tried to assess the conservation status of Javanese endemic *Strobilanthes* according to the IUCN Red List criteria and categories.

The data used were from herbarium specimens only. This means that information about each species is only from the location of the habitat available on the specimen labels, while natural population data is not available. In addition, the distribution of most of the Java endemic *Strobilanthes* is limited to certain locations. So that the criteria used are criteria B. Based on the results of the analyses, it is known that there are 5 species with status of Least Concern (LC) categories, namely *S. bibracteata*, *S. involucrata*, *S. alata*, *S. koordersii*, and *S. autapomorpha*. Species with Endangered (EN) status is *S. stenura* and it is in

need of protection. There are 3 species within the Critically Endangered (CR) category, namely *S. coertii*, *S. steenisiana*, and *S. afriastiniae*. Two species are in the Data Deficient (DD) category, namely *S. warburgii* and *S. winckelii*.

CONCLUSION

The observation on specimens and literature study showed that the total number of endemic Javanese *Strobilanthes* are 11 species. Assessment according to the Criteria and Categories of the IUCN Red List showed that the Javanese species are categorized into 4 categories: 1. Least Concern (LC), 5 species; 2. Endangered (EN), 1 species; 3. Critically Endangered (CR), 3 species; and 4. Data Deficient (DD), 2 species.

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Pedoman Penulisan Naskah Berita Biologi

Berita Biologi adalah jurnal yang menerbitkan artikel kemajuan penelitian di bidang biologi dan ilmu-ilmu terkait di Indonesia. Berita Biologi memuat karya tulis ilmiah asli berupa makalah hasil penelitian, komunikasi pendek dan tinjauan kembali yang belum pernah diterbitkan atau tidak sedang dikirim ke media lain. Masalah yang diliput harus menampilkan aspek atau informasi baru.

Tipe naskah

1. Makalah lengkap hasil penelitian (*original paper*)

Naskah merupakan hasil penelitian sendiri yang mengangkat topik yang *up to date*. Tidak lebih dari 15 halaman termasuk tabel dan gambar. Pencantuman lampiran seperlunya, namun redaksi berhak mengurangi atau meniadakan lampiran.

2. Komunikasi pendek (*short communication*)

Komunikasi pendek merupakan makalah hasil penelitian yang ingin dipublikasikan secara cepat karena hasil temuan yang menarik, spesifik dan atau baru, agar dapat segera diketahui oleh umum. Hasil dan pembahasan dapat digabung.

3. Tinjauan kembali (*review*)

Tinjauan kembali merupakan rangkuman tinjauan ilmiah yang sistematis-kritis secara ringkas namun mendalam terhadap topik penelitian tertentu. Hal yang ditinjau meliputi segala sesuatu yang relevan terhadap topik tinjauan yang memberikan gambaran '*state of the art*', meliputi temuan awal, kemajuan hingga issue terkini, termasuk perdebatan dan kesenjangan yang ada dalam topik yang dibahas. Tinjauan ulang ini harus merangkum minimal 30 artikel.

Struktur naskah

1. Bahasa

Bahasa yang digunakan adalah Bahasa Indonesia atau Inggris yang baik dan benar.

2. Judul

Judul diberikan dalam bahasa Indonesia dan Inggris. Judul ditulis dalam huruf tegak kecuali untuk nama ilmiah yang menggunakan bahasa latin, Judul harus singkat, jelas dan mencerminkan isi naskah dengan diikuti oleh nama serta alamat surat menyurat penulis dan alamat email. Nama penulis untuk korespondensi diberi tanda amplop cetak atas (*superscript*). Jika penulis lebih dari satu orang bagi pejabat fungsional penelitian, pengembangan agar menentukan status sebagai kontributor utama melalui penandaan simbol dan keterangan sebagai kontributor utama dicatatkan kaki di halaman pertama artikel.

3. Abstrak

Abstrak dibuat dalam dua bahasa, bahasa Indonesia dan Inggris. Abstrak memuat secara singkat tentang latar belakang, tujuan, metode, hasil yang signifikan, kesimpulan dan implikasi hasil penelitian. Abstrak berisi maksimum 200 kata, spasi tunggal. Di bawah abstrak dicantumkan kata kunci yang terdiri atas maksimum enam kata, dimana kata pertama adalah yang terpenting. Abstrak dalam Bahasa Inggris merupakan terjemahan dari Bahasa Indonesia. Editor berhak untuk mengedit abstrak demi alasan kejelasan isi abstrak.

4. Pendahuluan

Pendahuluan berisi latar belakang, permasalahan dan tujuan penelitian. Perlu disebutkan juga studi terdahulu yang pernah dilakukan terkait dengan penelitian yang dilakukan.

5. Bahan dan cara kerja

Bahan dan cara kerja berisi informasi mengenai metode yang digunakan dalam penelitian. Pada bagian ini boleh dibuat sub-judul yang sesuai dengan tahapan penelitian. Metoda harus dipaparkan dengan jelas sesuai dengan standar topik penelitian dan dapat diulang oleh peneliti lain. Apabila metoda yang digunakan adalah metoda yang sudah baku cukup ditulis sitasinya dan apabila ada modifikasi maka harus dituliskan dengan jelas bagian mana dan hal apa yang dimodifikasi.

6. Hasil

Hasil memuat data ataupun informasi utama yang diperoleh berdasarkan metoda yang digunakan. Apabila ingin mengacu pada suatu tabel/ grafik/diagram atau gambar, maka hasil yang terdapat pada bagian tersebut dapat diuraikan dengan jelas dengan tidak menggunakan kalimat 'Lihat Tabel 1'. Apabila menggunakan nilai rata-rata maka harus menyertakan pula standar deviasinya.

7. Pembahasan

Pembahasan bukan merupakan pengulangan dari hasil. Pembahasan mengungkap alasan didapatkannya hasil dan arti atau makna dari hasil yang didapat tersebut. Bila memungkinkan, hasil penelitian ini dapat dibandingkan dengan studi terdahulu.

8. Kesimpulan

Kesimpulan berisi infomasi yang menyimpulkan hasil penelitian, sesuai dengan tujuan penelitian, implikasi dari hasil penelitian dan penelitian berikutnya yang bisa dilakukan.

9. Ucapan terima kasih

Bagian ini berisi ucapan terima kasih kepada suatu instansi jika penelitian ini didanai atau didukungan oleh instansi tersebut, ataupun kepada pihak yang membantu langsung penelitian atau penulisan artikel ini.

10. Daftar pustaka

Tidak diperkenankan untuk mensitis artikel yang tidak melalui proses *peer review*. Apabila harus menyitir dari "laporan" atau "komunikasi personal" dituliskan '*unpublished*' dan tidak perlu ditampilkan di daftar pustaka. Daftar pustaka harus berisi informasi yang *up to date* yang sebagian besar berasal dari *original papers* dan penulisan terbitan berkala ilmiah (nama jurnal) tidak disingkat.

Format naskah

1. Naskah diketik dengan menggunakan program Microsoft Word, huruf New Times Roman ukuran 12, spasi ganda kecuali Abstrak spasi tunggal. Batas kiri-kanan atas-bawah masing-masing 2,5 cm. Maksimum isi naskah 15 halaman termasuk ilustrasi dan tabel.

2. Penulisan bilangan pecahan dengan koma mengikuti bahasa yang ditulis menggunakan dua angka desimal di belakang koma. Apabila menggunakan Bahasa Indonesia, angka desimal ditulis dengan menggunakan koma (,) dan ditulis dengan menggunakan titik (.) bila menggunakan bahasa Inggris. Contoh: Panjang buku adalah 2,5 cm. Length of the book is 2.5 cm. Penulisan angka 1-9 ditulis dalam kata kecuali bila bilangan satuan ukur, sedangkan angka 10 dan seterusnya ditulis dengan angka. Contoh lima orang siswa, panjang buku 5 cm.

3. Penulisan satuan mengikuti aturan *international system of units*.

4. Nama takson dan kategori taksonomi ditulis dengan merujuk kepada aturan standar yang diajui. Untuk tumbuhan menggunakan *International Code of Botanical Nomenclature* (ICBN), untuk hewan menggunakan *International Code of Zoological Nomenclature* (ICZN), untuk jamur *International Code of Nomenclature for Algae, Fungi and Plant* (ICAFP), *International Code of Nomenclature of Bacteria* (ICNB), dan untuk organisme yang lain merujuk pada kesepakatan Internasional. Penulisan nama takson lengkap dengan nama author hanya dilakukan pada bagian deskripsi takson, misalnya pada naskah taksonomi. Penulisan nama takson untuk bidang lainnya tidak perlu menggunakan nama author.

5. Tata nama di bidang genetika dan kimia merujuk kepada aturan baku terbaru yang berlaku.

6. Untuk range angka menggunakan en dash (-), contohnya pp.1565–1569, jumlah anakan berkisar 7–8 ekor. Untuk penggabungan kata menggunakan hyphen (-), contohnya: masing-masing.

7. Ilustrasi dapat berupa foto (hitam putih atau berwarna) atau gambar tangan (*line drawing*).

8. Tabel

Tabel diberi judul yang singkat dan jelas, spasi tunggal dalam bahasa Indonesia dan Inggris, sehingga Tabel dapat berdiri sendiri. Tabel diberi nomor urut sesuai dengan keterangan dalam teks. Keterangan Tabel diletakkan di bawah Tabel. Tabel tidak dibuat tertutup dengan garis vertikal, hanya menggunakan garis horizontal yang memisahkan judul dan batas bawah.

8. Gambar
Gambar bisa berupa foto, grafik, diagram dan peta. Judul gambar ditulis secara singkat dan jelas, spasi tunggal. Keterangan yang menyertai gambar harus dapat berdiri sendiri, ditulis dalam bahasa Indonesia dan Inggris. Gambar dikirim dalam bentuk .jpeg dengan resolusi minimal 300 dpi, untuk *line drawing* minimal 600dpi.
9. Daftar Pustaka
Situs dalam naskah adalah nama penulis dan tahun. Bila penulis lebih dari satu menggunakan kata ‘dan’ atau *et al.* Contoh: (Kramer, 1983), (Hamzah dan Yusuf, 1995), (Premachandra *et al.*, 1992). Bila naskah ditulis dalam bahasa Inggris yang menggunakan sitasi 2 orang penulis maka digunakan kata ‘and’. Contoh: (Hamzah and Yusuf, 1995). Jika sitasi beruntun maka dimulai dari tahun yang paling tua, jika tahun sama maka dari nama penulis sesuai urutan abjad. Contoh: (Anderson, 2000; Agusta *et al.*, 2005; Danar, 2005). Penulisan daftar pustaka, sebagai berikut:
 - a. **Jurnal**
Nama jurnal ditulis lengkap.
Agusta, A., Maehara, S., Ōhashi, K., Simanjuntak, P. and Shibuya, H., 2005. Stereoselective oxidation at C-4 of flavans by the endophytic fungus *Diaporthe* sp. isolated from a tea plant. *Chemical and Pharmaceutical Bulletin*, 53(12), pp.1565–1569.
 - b. **Buku**
Anderson, R.C. 2000. *Nematode Parasites of Vertebrates, Their Development and Transmission*. 2nd ed. CABI Publishing. New York. pp. 650.
 - c. **Prosiding atau hasil Simposium/Seminar/Lokakarya.**
Kurata, H., El-Samad, H., Yi, T.M., Khammash, M. and Doyle, J., 2001. Feedback Regulation of the Heat Shock Response in *Escherichia coli*. *Proceedings of the 40th IEEE Conference on Decision and Control*. Orlando, USA pp. 837–842.
 - d. **Makalah sebagai bagian dari buku**
Sausan, D., 2014. Keanekaragaman Jamur di Hutan Kabungolor, Tau Lumbis Kabupaten Nunukan, Kalimantan Utara. Dalam: Irham, M. & Dewi, K. eds. *Keanekaragaman Hayati di Beranda Negeri*. pp. 47–58. PT. Eaststar Adhi Citra. Jakarta.
 - e. **Thesis, skripsi dan disertasi**
Sundari, S., 2012. Soil Respiration and Dissolved Organic Carbon Efflux in Tropical Peatlands. *Dissertation*. Graduate School of Agriculture. Hokkaido University. Sapporo. Japan.
 - f. **Artikel online.**
Artikel yang diunduh secara online ditulis dengan mengikuti format yang berlaku untuk jurnal, buku ataupun thesis dengan dilengkapi alamat situs dan waktu mengunduh. Tidak diperkenankan untuk menseptisasi artikel yang tidak melalui proses peer review misalnya laporan perjalanan maupun artikel dari laman web yang tidak bisa dipertangung jawabkan kebenarannya seperti wikipedia.
Himman, L.M., 2002. A Moral Change: Business Ethics After Enron. San Diego University Publication. <http://ethics.sandiego.edu/LMH/oped/Enron/index.asp>. (accessed 27 Januari 2008) bila naskah ditulis dalam bahasa inggris atau (diakses 27 Januari 2008) bila naskah ditulis dalam bahasa indonesia

Formulir persetujuan hak alih terbit dan keaslian naskah

Setiap penulis yang mengajukan naskahnya ke redaksi Berita Biologi akan diminta untuk menandatangani lembar persetujuan yang berisi hak alih terbit naskah termasuk hak untuk memperbaiknya melalui artikel dalam berbagai bentuk kepada penerbit Berita Biologi. Sedangkan penulis tetap berhak untuk menyebarluaskan edisi cetak dan elektronik untuk kepentingan penelitian dan pendidikan. Formulir itu juga berisi pernyataan keaslian naskah yang menyebutkan bahwa naskah adalah hasil penelitian asli, belum pernah dan tidak sedang diterbitkan di tempat lain serta bebas dari konflik kepentingan.

Penelitian yang melibatkan hewan dan manusia

Setiap naskah yang penelitiannya melibatkan hewan (terutama mamalia) dan manusia sebagai obyek percobaan/penelitian, wajib menyertakan ‘ethical clearance approval’ yang dikeluarkan oleh badan atau pihak berwenang.

Lembar ilustrasi sampul

Gambar ilustrasi yang terdapat di sampul jurnal Berita Biologi berasal dari salah satu naskah yang dipublikasi pada edisi tersebut. Oleh karena itu, setiap naskah yang ada ilustrasinya diharapkan dapat mengirimkan ilustrasi atau foto dengan kualitas gambar yang baik dengan disertai keterangan singkat ilustrasi atau foto dan nama pembuat ilustrasi atau pembuat foto.

Proofs

Naskah proofs akan dikirim ke penulis dan penulis diwajibkan untuk membaca dan memeriksa kembali isi naskah dengan teliti. Naskah proofs harus dikirim kembali ke redaksi dalam waktu tiga hari kerja.

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Naskah dikirim secara online ke website berita biologi: http://e-journal.biologi.lipi.go.id/index.php/berita_biologi

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