

*Inventory of the Genus *Baccaurea* Spp. (Phyllanthaceae)*

Review

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Abstract – *Baccaurea* is a genus of the Phyllanthaceae family which consists of fruit tree species. This plant is a wild plant that lives naturally in the forest. Information about the existence of this tree is important to know for use and conservation. Inventory is an important basis for knowing the diversity of *Baccaurea* species. Based on the GBIF website, POWO and Plants of Southeast Asia have published 173 types of *Baccaurea*, but 87 species are synonyms and only 47 species have been accepted. The distribution area of *Baccaurea* is very wide, stretching from India, Southeast Asia and the Indomalaya region. The most common type was *B. ramiflora* with 603 individuals, while the least common types were *B. sylvestris*, *B. taitensis*, *B. dasystachya*, and *B. teminalifolia*, each of which was only found in one individual.

Keywords – *Baccaurea*; Inventory; Diversity; Distribution

I. INTRODUCTION

Baccaurea Lour. is a genus of angiosperm plants belonging to the Phyllanthaceae family^[1]. This genus includes a group of fruit-producing plants. Loureiro^[2], was the researcher who first explained and described the genus *Baccaurea*. The characteristics of *Baccaurea* are shrub and tree habitus, dioecious, terminalia branching pattern, inflorescences attached to the stem, flower arrangement in clusters, subrounded to round fruit and juicy flesh (arillode) with a taste that varies from sour to sweet^[3]. The bacca fruit type (Berry) is produced from a single ovary, which has two ovules per ovary locus which is a characteristic that underlies the terminology of the genus *Baccaurea*^[4]. Taxonomically, detailed information about *Baccaurea* is important to know. *Baccaurea* is a fruit-producing wild plant that lives naturally in forests. Gunawan^[5] revealed that *Baccaurea* has potential as a source of natural ingredients for medicine and its distribution area also stretches widely^[6-7]. Apart from that, its existence is very important for the balance of the ecosystem because of its role as food for many species^[8]. Considering the high potential of *Baccaurea*, efforts need to be made to maintain *Baccaurea* species in the world, including efforts to preserve *Baccaurea* genetic material. The rate of extinction of species due to human activities has now reached an alarming level. It is estimated that nearly 140 species disappear every day^[9]. Many species will become extinct before we know their potential and existence. Inventory is the activity of recording and collecting plant data based on determining plants according to their morphological characteristics and classification^[10].

Inventorying flora diversity in Indonesia has been started since Rumphius in 1970, but until now this activity must continue to obtain information data on plant biodiversity in the world. According to Wijaya^[11] It is considered necessary to have taxonomists, namely people who are involved even though these people are not taxonomists. Taxonomists can consist of high school students, students, lecturers, employees in related departments or ordinary people. By increasing the number of

taxonomists in the regions, it is hoped that inventory of flora in Indonesia will be carried out more quickly. Inventory is an important basis, especially in assessing biodiversity in a particular area^[12]. Therefore, it is important to carry out inventory activities of *Baccaurea* to find out information on the diversity of its types which can be used as a reference or literature source for further related research.

II. RESEARCH METHODS

The inventory review method used in this article is data recap via official websites such as GBIF, POWO and Plants of Southeast Asia. Apart from that, there is also a survey method by exploring the field and directly collecting samples obtained in the field.

III. RESULTS AND DISCUSSION

Inventory data shows that there are 173 species of *Baccaurea* that have been published on the GBIF website, however 87 species are synonyms and only 47 species are clearly known (Table 1). This species is found in different areas. According to Haegens[6], the distribution area of *Baccaurea* stretches widely, namely Indonesia, Malaysia, China, Thailand, Papua New Guinea, Brunei Darussalam, Philippines, India, Singapore and Vietnam[13].

Table 1. *Baccaurea* Inventory Results

No.	Species	Number of individuals input	Distribution Area	IUCN Status
1.	<i>Baccaurea ramiflora</i> Lour.	603	China, Thailand, Brunei Darussalam, India, Vietnam	Least Concern
2.	<i>Baccaurea tetrandra</i> (Baill.) Müll.Arg.	361	Indonesia, Malaysia, Thailand, Brunei Darussalam, Philippines	Least Concern
3.	<i>Baccaurea lanceolata</i> (Miq.) Müll.Arg.	328	Indonesia, Malaysia, Thailand, Brunei Darussalam, Philippines	Vulnerable
4.	<i>Baccaurea racemosa</i> (Reinw.) Müll.Arg.	294	Indonesia, Malaysia, Thailand, Brunei Darussalam	Not evaluated
5.	<i>Baccaurea bracteata</i> Mull. Arg.	285	Indonesia, Malaysia, Thailand, Brunei Darussalam, Singapore	Not evaluated
6.	<i>Baccaurea javanica</i> (Blume)Müll.Arg.	256	Indonesia, Papua New Guinea, India	Not evaluated
7.	<i>Baccaurea parviflora</i> (Müll.Arg) Müll.Arg.	239	Indonesia, Malaysia, Thailand, Brunei Darussalam, Singapore, Vietnam	Not evaluated
8.	<i>Baccaurea macrocarpa</i> (Miq.) Müll.Arg.	239	Indonesia, Malaysia, Thailand, Brunei Darussalam, Singapore	Not evaluated
9.	<i>Baccaurea sumatrana</i> (Miq.) Müll.Arg.	202	Indonesia, Malaysia, Brunei Darussalam, India, Singapore	Not evaluated

10.	<i>Baccaurea papuana</i> FMBailey.	188	Indonesia, Papua New Guinea	Least Concern
11.	<i>Baccaurea odoratissima</i> Elmer.	157	Indonesia, Malaysia, Brunei Darussalam, Philippines	Vulnerable
12.	<i>Baccaurea sarawakensis</i> Pax & K. Hoffman.	145	Indonesia, Malaysia, Brunei Darussalam	Not evaluated
13.	<i>Baccaurea nanihua</i> Merr.	140	Indonesia, Papua New Guinea, Philippines	Least Concern
14.	<i>Baccaurea motleyana</i> (Müll.Arg) Müll.Arg.	120	Indonesia, Malaysia, Thailand, Papua New Guinea, Brunei Darussalam, Singapore	Least Concern
15.	<i>Baccaurea brevipes</i> Hook.f.	113	Indonesia, Malaysia, Thailand	Not evaluated
16.	<i>Baccaurea pyriformis</i> Gage.	109	Indonesia, Malaysia, Brunei Darussalam	Least Concern
17.	<i>Baccaurea minor</i> Hook.f.	108	Indonesia, Malaysia, Brunei Darussalam, Singapore	Not evaluated
18.	<i>Baccaurea polyneura</i> Hook.f.	100	Indonesia, Malaysia, Thailand, Brunei Darussalam, Singapore	Not evaluated
19.	<i>Baccaurea deflexa</i> Müll.Arg.	98	Indonesia	Not evaluated
20.	<i>Baccaurea pubera</i> (Miq)Müll.Arg.	98	Indonesia, Malaysia, Brunei Darussalam	Not evaluated
21.	<i>Baccaurea angulata</i> Merr.	89	Indonesia, Malaysia, Brunei Darussalam	Not evaluated
22.	<i>Baccaurea dulcis</i> (Jack) Müll.Arg.	78	Indonesia	Least Concern
23.	<i>Baccaurea courtallensis</i> (Wight) Mull. Arg.	75	India	Not evaluated
24.	<i>Baccaurea trigonocarpa</i> Merr.	62	Indonesia, Malaysia, Brunei Darussalam	Not evaluated
25.	<i>Baccaurea macrophylla</i> (Mull. Arg) Mull. Arg.	56	Indonesia, Thailand	Not evaluated
26.	<i>Baccaurea edulis</i> Merr.	56	Indonesia, Malaysia, Brunei Darussalam	Not evaluated
27.	<i>Baccaurea philippinensis</i> (Merr.) Merr.	51	Indonesia, Papua New Guinea, Philippines	Least Concern
28.	<i>Baccaurea reticulata</i> Hook.f.	50	Indonesia, Malaysia, Brunei Darussalam	Not evaluated
29.	<i>Baccaurea maingayi</i> Hook.f.	42	Indonesia, Malaysia	Not evaluated
30.	<i>Baccaurea mollis</i> Haegens.	31	Indonesia, Brunei Darussalam	Not evaluated

31.	<i>Baccaurea multiflora</i> Burck ex JJSM.	27	Indonesia	Not evaluated
32.	<i>Baccaurea simaloerensis</i> Haegens.	23	Indonesia	Not evaluated
33.	<i>Baccaurea dolichobotrys</i> Merr.	20	Indonesia	Not evaluated
34.	<i>Baccaurea velutina</i> (Ridl.) Ridl.	17	Indonesia	Not evaluated
35.	<i>Baccaurea nesophila</i> Airy Shaw.	13	Papua New Guinea	Data Deficient
36.	<i>Baccaurea costulata</i> (Miq.) Mull. Arg.	11	Indonesia	Vulnerable
37.	<i>Baccaurea purpurea</i> Haegens.	10	Papua New Guinea	Vulnerable
38.	<i>Baccaurea sapida</i> Bedd.	10	China	Not evaluated
39.	<i>Baccaurea seemannii</i> Mull. Arg.) Mull. Arg.	8	Fiji, Samoa, Nieu	Not evaluated
40.	<i>Baccaurea annamensis</i> Gagnep.	6	Vietnamese	Not evaluated
41.	<i>Baccaurea carinata</i> Haegens.	5	Papua New Guinea	Endangered
42.	<i>Baccaurea microcarpa</i> (Airy Shaw) Haegens.	3	Papua New Guinea	Data Deficient
43.	<i>Baccaurea ptychopyxis</i> Airy Shaw	2	Thailand	Not evaluated
44.	<i>Baccaurea sylvestris</i> Lour.	1	Vietnamese	Data Deficient
45.	<i>Baccaurea taitensis</i> Mull. Arg.	1	French Polynesia	Not evaluated
46.	<i>Baccaurea dasystachya</i> Miq	1	Indonesia	Not evaluated
47.	<i>Baccaurea teminalifolia</i> Elmer.	1	Philippines	Not evaluated

Based on the results of an inventory of 47 species of *Baccaurea*, the most common type found, namely *B. ramiflora*, was 603 individuals. Meanwhile, the fewest types found were *B. sylvestris*, *B. taitensis*, *B. dasystachya*, and *B. teminalifolia*, where only 1 individual was found of each species. Then, based on the distribution area of *Baccaurea*, the country with the most diversity of *Baccaurea* species is Indonesia with 34 species. Meanwhile, the country that has the least diversity of *Baccaurea* species is China with 2 species. According to Suwardi^[14], 80% of wild plants live in tropical forests. Apart from that, each country has native *Baccaurea* species which are only found in that area, namely Indonesia (*B. deflexa*, *B. dulcis*, *B. multiflora*, *B. simaloerensis*, *B. costulata*, *B. velutina*, and *B. dolichobotrys*); China (*B. sapida*); Thailand (*B. ptychopyxis*); Philippines (*B. teminalifolia*); Indian (*B. courtallensis*); Papua New Guinea (*B. microcarpa*, *B. purpurea*, *B. carinata*, and *B. nesophila*); Vietnam (*B. annamensis*, and *B. sylvestris*). Research on the taxonomy, phylogeny and biogeography of *Baccaurea* has been carried out by Haegens^[6] Based on morphological characters, the research results found as many as 43 types of *Baccaurea*. species of *Baccaurea* that were not found in Haegens' research were *B. sylvestris*, *B. taitensis*, *B. dasystachya*, and *B. teminalifolia*. The next *Baccaurea* research was carried out by Gunawan^[15] about the biosystematics of *B. angulata*, namely with key characteristicsthe leaf stalks have sparse hair, the color of the female flower stalk is red, the shape of the stigma is mementhol, the color of the pistil is red, there are no protective flower leaves, the length of the pistil is 3-4 mm, the shape of the fruit is rounded in cross section with a tapered tip, and the shape of the seeds is oval and Research on *Baccaurea* diversity in Aceh has also been carried out by Navia^[16] Diversity results showed that there were nine species of *Baccaurea* distributed in Aceh, namely *B. brevipes*, *B. deflexa*, *B. lanceolata*, *B. macrocarpa*, *B. macrophylla*, *B. parviflora*, *B. polyneura*, *B. racemosa* and *B. sumatrana*. Based on IUCN status, 47 species of *Baccaurea* occupy five status categories, namely 31 species (not evaluated); 8 species (Least Concern); 4 species (Vulnerable); 3 species (Data Deficient) and 1 species (Endangered). The endangered species is *B. carinata*. This species

is only distributed in the Papua New Guinea region. This species will face a very high risk of extinction in the future. Especially for *B. carinata*, security and conservation efforts need to be made so that this species continues to be maintained and does not become extinct. The disappearance of one species from the face of the earth means a reduction in natural wealth.

IV. CONCLUSION

Based on the inventory results, 173 species of *Baccaurea* have been published, however 87 species are synonyms and only 47 species are accepted. *Baccaurea* distribution are namely Indonesia, Malaysia, China, Thailand, Papua New Guinea, Brunei Darussalam, Philippines, India, Singapore and Vietnam. There is one species of *Baccaurea* that is threatened with extinction, namely *B. carinata*.

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