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New and noteworthy records of eaglewood from Buru, Moluccas, Indonesia

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²[Center for Southeast Asian Studies \(CSEAS\) Kyoto University](#), Japan

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Abstract

In the exploration of eaglewood species in Buru Island, Maluku Islands, Indonesia on February 1-5, 2017, three noteworthy eaglewood species were found. One species was *Gyrinops moluccana* (Miq.) Baill in Namrinat village and Tikbary village, Namrole district, South Buru. This species has been mentioned in 1959 by Hou and Keliopas in 2013, however they were found in Kayeli area, North Buru. Three other species of eaglewood were new records to Buru. Two newly recorded species, first *Gyrinops decipiens* Ding Hou that was found at Waeduna Mount, Bara village, Aer Buaya district, North Buru and second *Gyrinops salicifolia* Ridl. from Tikbary village, Namrole district, South Buru. One genus was a new record to Buru island, namely *Aquilaria*. Its species was *Aquilarifilaria* (Oken) Merr. that was found together with *G. salicifolia* in Tikbary village, Namrole district, South Buru.

REFERENCES

1. D. Hou, *Flora Malesiana* **6**(1): 1–42 (1960). [Google Scholar](#)
2. *The Plant List*. Version 1.1. Published on the Internet; [http://www.theplantlist.org/tpl1.1/search?q=Gyrinops\(2013\)](http://www.theplantlist.org/tpl1.1/search?q=Gyrinops(2013)), (accessed August 4, 2019). [Google Scholar](#)
3. T. Mulyaningsih & I. Yamada. Two New species of *Gyrinops* (Thymelaeaceae) from North Celebes, Indonesia. Paper of SAGE 2017, Bogor, (Augusts 28-31, 2017). [Google Scholar](#)
4. T. Mulyaningsih, D. Marsono, Sumardi, & I. Yamada. Selection of Superior Breeding Infrasppecies Gaharu of *Gyrinops versteegii* (Gilg) Domke. *Journal of Agricultural Science and Technology* **B 4**, 485–492(2014). [Google Scholar](#)

5. 5. K. Keliopas, K. Neville, H. Charlie, F. Sepus, S. Tri, & B. Hendrik. The biodiversity and ecology on the Buru island; Important value of conservation and environmentally manage Proceedings International Seminar "Food Sovereignty and Natural Resources in Archipelago Region" Union of Maluku Students (Permama) and IPB, Bogor (2013). [Google Scholar](#)
6. 6. A. Susilo, T. Kalima, & E. Santoso. Panduan lapangan pengenalan jenis pohon penghasil gaharu *Aquilaria* spp. di Indonesia. Pusat Penelitian dan Pengembangan Konservasi dan Rehabilitasi International Tropical Timber Organization (ITTO) – CITES Phase II Project (2014). [Google Scholar](#)
7. 7. T. Mulyaningsih, I. Yamada, Notes on some of agarwood in Nusa Tenggara, Celebes and West Papua, in: Natural Resource Management and Socio-Economic Transformation under the Decentralization in Indonesia, *Toward Sulawesi Area Studies*, Center for Southeast Asian Studies Kyoto University (CSEAS), Kyoto (2008). [Google Scholar](#)
8. 8. B. P. Gunn, P. Stevens, M. Singadan, L. Sunari & P. Chatterton. Eaglewood in Papua New Guinea. Proceeding of the first International Agarwood Conference. Tropical Rainforest Project, Vietnam (2003). [Google Scholar](#)
9. 9. T. Mulyaningsih & I. Yamada. Tree species of *Aquilaria* (Thymelaeaceae) from Borneo Indonesia. AIP Conference Proceedings 2023, Editors by T. Mart *et al.* (American Institute of Physics, Melville, NY, 2018), pp. 111–115. [Google Scholar](#)
10. 10. *The Plant List*. Version 1.1. Published on the Internet; <http://www.theplantlist.org/tpl1.1/search?q=Aquilaria> (2013), (accessed August 4, 2019). [Google Scholar](#)
11. 11. A. E. Radford, W. C. Dickson, J. M. Massey, and C. R. Bell, *Vascular Plant Systematics* (Harper & Row, New York, 1974). [Google Scholar](#)
12. 12. M. G. Simpson, *Plant Systematics* (Academic Press, Amsterdam, 2006). [Google Scholar](#)
13. 13. B.D. Grimes. Chapter 6. Mapping Buru: The Politics of Territory and Settlement on an Eastern Indonesian Island. In T. Reuter (ed.). *Sharing the earth, Dividing the Land. Land and territory in the Austronesian world*. (ANU E Press. Canberra, 2006), pp. 135–156. [Google Scholar](#)
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New and Noteworthy Records of Eaglewood from Buru, Moluccas, Indonesia

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Abstract. In the exploration of eaglewood species in Buru Island, Maluku Islands, Indonesia on February 1-5, 2017, three noteworthy eaglewood species were found. One species was *Gyrinops moluccana* (Miq.) Baill in Namrinat village and Tikbary village, Namrole district, South Buru. This species has been mentioned in 1959 by Hou and Keliopas in 2013, however they were found in Kayeli area, North Buru. Three other species of eaglewood were new records to Buru. Two newly recorded species, first *Gyrinops decipiens* Ding Hou that was found at Waeduna Mount, Bara village, Aer Buaya district, North Buru and second *Gyrinops salicifolia* Ridl. from Tikbary village, Namrole district, South Buru. One genus was a new record to Buru island, namely *Aquilaria*. Its species was *Aquilaria filaria* (Oken) Merr. that was found together with *G. salicifolia* in Tikbary village, Namrole district, South Buru.

INTRODUCTION

Gyrinops and *Aquilaria* are a member of the Thymelaeaceae family, belonging to the subfamily of Aquiroideae [1]. The genus *Gyrinops* consists of as many as 9 species [1,2]. In 2017 the species belonging to this genus increased by two new species that come from Minahasa [3]. The geographical distribution of the genus is confined to the Wallacea region [1,4,3]. One of this species, *G. moluccana* was spread in Moluccas islands, among of them are Hamahera, Morotai and in Keyeli Buru [1,5]. Others species were *G. decipiens* that was found growing in Celebes and *G. salicifolia* was distributed in New Guinea, however both species were not recorded in Buru island [1,6,7,8]. While the genus *Aquilaria* has been recorded to consist of 47 species but only 20 species included accepted species. In 2018, in North Borneo was found 3 new species [9,10]. Most of these species of the genus was distributed on the west of Wallace line, except two species of *A. cumingiana*, and *A. filaria*. The species of *A. filaria* spread out to Moluccas (Morotai, Ceram, and Ambon), and New Guinea (Sorong, Babo, and Kapor), but this genus was not recorded yet in Buru [1,6,8], Maluku, also known as the Moluccas, belongs to the Wallacea biogeographical region. Those specimens belonging to *G. decipiens*, *G. salicifolia*, and *A. filaria* have been recently collected in the north west part of the Buru Island for the first species and both others species from south east Buru island. The characters of these specimens were found to match to *G. decipiens*, *G. salicifolia*, and *A. filaria*. This discovery becomes the first record of the genus of *Aquilaria* and 2 species of genus *Gyrinops* for this island. The description of these species is prepared based on recently collected material and presented in this account.

MATERIALS AND METHODS

The specimens of eaglewood have been collected on February 1-5, 2017, from Bara village, Aer Buaya district, north west Buru, Palmite village, Manrinat village and Tikbary village, Namrore, south east Buru, Maluku Islands, Indonesia. The specimens have been preserved in the form of dried herbarium specimens and supplemented with spirit material for flowers. The specimens were later deposited in the herbarium of Mataram University, Mataram, Lombok, West Nusa Tenggara, Indonesia (MUL). Identification of these specimens were used the relevant references [1,11,12]. A morphological description has been prepared based on materials from the collections of Buru Island.

RESULTS AND DISCUSSION

Key to Species

1. a. Leaves linear.....2
- b. Leaves elliptic, obovate-oblong.....3
2. a. Leaves > 15 cm length, >2.5cm in diameter, nerves >60*G. moluccana*
- b. Leaves < 4 cm length, < 1 cm in diameter, nerves <60.....*G. salicifolia*
3. a. Petioles glabrous, leaves obovate or obovate-oblong, tip acute or emarginated up to 0.4 cm length, margin undulate, nerves <50.....*G. decipiens*
- b. Petioles tomentose, leaves elliptic or lanceolate, tip cuspidate or caudate up to 1.6 cm length, margin entire, nerves up to>50.....*A. filaria*

Description

Gyrinopsmoluccana (Miq.) Baill. *Adansonia* 11 (1875) 326; *Gilg in E. & P. Pfl. Fam.* 3, 6a (1894) 225; *Boerl. Handl.* 3 (1900) 111; *Quis. J.Am. Arb.* 27 (1946) 404.

Shrub, 2 m height, 3 cm diameter, bark light brown with grey spot. Young branches tomentose. Leaves chartaceous, glabrous on the upper surface and tomentose on the lower surface, lanceolate-oblong, 16.6-18.3 cm by 2.7-3.95 cm, base obtuse; apex acuminate-caudate up to 0.9-1.9 cm; nerves 31-62 pairs, slightly curved and ascending, at c.60° to the midrib, distinct or visible beneath, indistinct above; veins it parallel; Petiole tomentose beneath, 0.4-0.55 cm by 0.1-0.2cm.

Vernacular Names. Gaharudaunpanjang.

Distribution. Moluccas, South Buru, Namrole district, Manrinat village. However, Hou [1], showed that *G. moluccana* was distributed from Kayeli, Buru.

Habitat & ecology. At the slopes and valley of Manrinat hill and Tikbary hill.

Notes. *G. moluccana*, on young trees, the main characters could be seen on leaves: oblong to linier, nerve up to 62 pairs, slightly curved and ascending, at c.60°.

Specimen examined. South Buru: fresh specimen of young branches from young trees, T. Mulyaningsih, 357

Gyrinopssalicifolia Ridl. *Trans. Linn. Soc. Bot. II*, 9 (1916) 145.

Slender shrub, c. 1 m. Branchlets light brown, pubescent. Leaves sparsely pubescent on the midrib and sometimes on the nerves and veins beneath, lanceolate to linear-lanceolate, 2.65-3.9 cm by 0.45-0.5 cm; base cuneate; apex acute or acute with the tip rounded; nerves 24-26 pairs, nerves and veins similar and equally strong, slightly visible beneath, obscure above; petiole c. 0.25-0.35 cm by 0.05 cm, puberulent beneath.

Vernacular Names. Gaharudaunhalus (Tikbary).

Distribution. Moluccas, South Buru, Namrole district, Tikbary village.

Habitat & ecology. At the slope of the hill of Tikbaryvillage.

Notes. *G. salicifolia*, on young trees, the main characters were seen on leaves: narrow linier, up to 4 cm length, nerve slightly curved and ascending, at c.60°.

Specimen examined. South Buru: fresh specimen of young branches from young trees, T. Mulyaningsih, 358.

Gyrinopsdecipiens, van Stennis, *Fl. Mal.* 6 (1960) 39-42.

Shrub, 15cm diam, 5m height, bark cream with grey spot. Branches puberulent. Leaves chartaceous, glabrous, rarely sparsely pubescent beneath, shining on both surfaces when dry, elliptic-or slightly obovate-oblong, 8.2-14 by 3.45-5.3cm; base narrowly cuneate; apex shortly acuminate; nerves 24-47 pairs, slightly curved or obliquely spreading towards the margin, elevated beneath, visible sometimes obscure above; margin glabrous, entire and undulate. Inflorescences terminal and axillary, umbelliform, 5-23-flowered; 1-2 umbel/ peduncle, peduncle puberulent, very short to 0.2-0.6 cm, thick 0.15-0.2cm, dense, knob-like thickened at the top, 1-2(5) peduncles/

node; pedicels puberulent, 0.45-1.55 cm by 0.05-0.1cm. Flowers long-tubular, 0.75-1.35cm by 0.25-0.45cm, calyx tube 0.1-0.2cm diameter. Floral tube almost glabrous inside. Calyx lobes oblong, .2-0.4cm by 0.1-0.15cm. Petaloid appendages, 0.1-0.15cm by 0.05-0.075cm united behind the stamens with hairs as long as themselves. Stamens oblong,0.75-0.2cm by 0.05-0.075cm, inserted slightly below the appendages; pistil clavate, tomentose, Stigma crested, 0.05-0.1cm by 0.05-0.1cm. Fruits unknown.

Vernacular Names. Gaharudaundurian (Bara), Gaharudaunlebar (Tikbary).

Distribution. Moluccas, North Buru, Aer Buaya District, Bara village.

Habitat & ecology. At the valleys and slopes of Waeduna Mount.

Notes. *G. decipiens*: leaves obovate or obovate-oblong, tip acute or emarginated up to 0.4 cm length, margin undulate, nerves < 48, petioles glabrous,nerve slightly curved and ascending. Inflorescences umbel, dense up to 23flowered/ umbel. Flower tubular with knob-like thickened at the top.

Specimen examined. North Buru: fresh specimen of young branches from young trees, T. Mulyaningsih, 533 & 534.

Aquilariafilaria (Oken) Merr. J. Arn. Arb. 31(1950) 283.

Shrub or tree up to 12 m by 18 cm. Young branchlets light-brown and grey spot, pubescent and glabrescent. Leaves subcoriaceous, glabrous or scattered hairy rarely pubescent beneath, oblong, elliptic-oblong to lanceolate, rarely oblanceolate-oblong, 12.15-16.5 by 4-5 cm; base obtuse to cuneate; apex narrowly acuminate-caudate up to 0,7-1,6 cm; nerves 24-57 pairs, nerves and veins usually homo-geneous, slightly elevated beneath, obscure above; petiole 5-6.5 mm, pubescent.

Vernacular Names. Gaharudauncengkeh (Tikbary).

Distribution. Moluccas, South Buru, Namrole District, Tikbary village. However, according to Hou& Gunn et al. [1, 8] that *A. filaria* was distributed in Malesia: Philippines (Dinagat I. and Bucas Grande.), Moluccas (Morotai, Ceram, and Ambon), and New Guinea (Sorong, Babo, and Kapor).

Habitat & ecology. On the hill in Tikbaryvillage.*A. filaria* plantation was found in Palmite

Notes. *A. filaria* could be differentiated among others eaglewood, because it has narrow linear leaves.

Specimen examined. North Buru: fresh specimen of young branches from young trees, T. Mulyaningsih, 356.

CONCLUSIONS

Based on this research can be conclude that there are 4 species of production agarwood, e.g. *Gyrinopsmoluccana* (Miq.) Baill and 2 species belonging to genus *Gyrinops* are new record to Buru, namely *Gyrinopsalicifolia*(Oken) Merr., *G. decipiens*Ding Hou and 1 species *Aquilariafilaria*Ridl. including into new record *Aquilaria* genus to Buru island.

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REFERENCES

1. D. Hou, *Flora Malesiana*6(1): 1-42 (1960).
2. *The Plant List*. Version 1.1. Published on the Internet; <http://www.theplantlist.org/tpl1.1/search?q=Gyrinops>(2013),(accessed August 4, 2019).
3. T.Mulyaningsih& I. Yamada. Two New species of *Gyrinops* (Thymelaeaceae) from North Celebes, Indonesia. Paper of SAGE 2017, Bogor, (Augusts 28-31, 2017).
4. T.Mulyaningsih, D. Marsono, Sumardi, & I. Yamada. Selection of Superior Breeding InfraspeciesGaharu of *Gyrinopsversteegii* (Gilg) Domke. *Journal of Agricultural Science and Technology* **B 4**, 485-492(2014).

5. K.Keliopas, K. Neville, H. Charlie, F. Sepus, S. Tri, & B. Hendrik. The biodiversity and ecology on the Buru island; Important value of conservation and environmentally manage Proceedings International Seminar “Food Sovereignty and Natural Resources in Archipelago Region” Union of Maluku Students (Permama) and IPB, Bogor (2013).
6. A.Susilo, T. Kalima, & E. Santoso. Panduan lapangan pengenalan jenis pohon penghasil gaharu *Aquilaria* spp. di Indonesia. Pusat Penelitian dan Pengembangan Konservasi dan Rehabilitasi International Tropical Timber Organization (ITTO) – CITES Phase II Project (2014).
7. T.Mulyaningsih, I. Yamada, Notes on some of agarwood in Nusa Tenggara, Celebes and West Papua, in: Natural Resource Management and Socio-Economic Transformation under the Decentralization in Indonesia, Toward Sulawesi Area Studies, Center for Southeast Asian Studies Kyoto University (CSEAS), Kyoto (2008).
8. B. P.Gunn, P. Stevens, M. Singadan, L. Sunari & P. Chatterton. Eaglewood in Papua New Guinea. Proceeding of the first International Agarwood Conference. Tropical Rainforest Project, Vietnam (2003).
9. T. Mulyaningsih & I. Yamada. Tree species of *Aquilaria* (Thymelaeaceae) from Borneo Indonesia. *AIP Conference Proceedings* 2023, Editors by T. Mart *et al.* (American Institute of Physics, Melville, NY, 2018), pp. 111–115.
10. *The Plant List*. Version 1.1. Published on the Internet; <http://www.theplantlist.org/tpl1.1/search?q=Aquilaria> (2013), (accessed August 4, 2019).
11. A. E. Radford, W. C. Dickson, J. M. Massey, and C. R. Bell, *Vascular Plant Systematics* (Harper & Row, New York, 1974).
12. M. G. Simpson, *Plant Systematics* (Academic Press, Amsterdam, 2006).
13. B.D. Grimes. Chapter 6. Mapping Buru: The Politics of Territory and Settlement on an Eastern Indonesian Island. In T. Reuter (ed.). *Sharing the earth, Dividing the Land. Land and territory in the Austronesian world.* (ANU E Press. Canberra, 2006), pp. 135-156.



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