Inventarization and conservation of indigenous orchids in harapan rain forest Jambi Province

To cite this article: U Yelianti et al 2018 J. Phys.: Conf. Ser. 1116 052078

View the article online for updates and enhancements.
Inventarization and conservation of indigenous orchids in Harapan rain forest Jambi Province

U Yelianti1*, E Gemita2 and S Schue3

1 Biology Department Teacher Training and Education Faculty Jambi University, Jl. Raya Jambi – Muaro Bulian Km 15 Mendalo Indah Jambi 36361
2 Researcher PT. Reki Harapan Rain Forest Jambi Province
3 Georg August University Gottingen

*E-mail: upik.yelianti@unja.ac.id

Abstract. Harapan Rain Forest (HRF) is is one of the lowland tropic that located in Sumatera. HRF has an area of 98.555 ha, of which 46.385 ha is located in Jambi Province and 52 170 ha in the Province of South Sumatra. Orchids is one of the indegenous species in HRF that’s endangered, it is caused by forest fire, illegal logging by the indegenous people (Suku Anak Dalam) and land convertion into palm oil plantation. So, it is important to know how many species of the Orchids that still hang on in the HRF and needed to protect by doing the research. This research aim is to do inventarization and conservation of the indegenous orchids from HRF. This research was arragned into two years, firstly: is inventarization by collecting samples, and the second years is to do conservation by tissue culture technique. Based on this research, the orchids have been collected from Harapan Rain Forest Jambi Province about 16 species. The species are dominated by Bulbophyllum, namely: Bulbophyllum Acutum, B. medusae, B. flavescence, B. sumatrana, Bulbophyllum sp1 and Bulbophyllum sp2. Only one orchid’s species that survive as an epiphyte and terresterial namely Gramatophyllum speciosumBl.. G. speciosum become endangered, because some of trees as a habitat are lossed by forest fire and human trafficking by explored without doing conservation. It is necessary to do the conservation of indigenous orchids for sustainable ecosystem in Harapan Rain Forest.

1. Introduction

Harapan Rain Forest (HRF) is located in Jambi province of South Sumatera as the fireplace of Sumatera in Indonesia. HRF is also called Sundaic dry lowland forest. This kind of forest is consider as the most biological district on land, hence it is being one of the most endangered region. Sumatera dry lowland forests occupied around 16 billion ha in 1900. Today a mere 400,000-600,000 remain. Logged over area such as HRF are not primary forest anymore. Nevertheless, it is inhabited by wildlife living in the smaller trees and bushes and in the river within rain forest. The habitat maintains the tremendous support for future restoration [1].

Almost 15 months the research have done in HRF in Jambi Province and it showed that there are hundred plants and animals, but around 109 of them are threatened. That’s caused by the density of trees are less by illegal logging and land conversion into oil palm plantation. It’s mean that loss of the habitats of many kinds of animals and plants [1]. Orchids is one of the indegenous species in HRF that’s endangered. So, it’s important to know how many species of the Orchids that still hang on in
the HRF and needed to protect by doing the research. This research will take about one year. First step: is to collect the indigenous Orchids from the HRF and identify their species. The second step: is doing propagation of Orchids by tissue culture and then restored to the HRF again.

Orchids are members of the Orchidaceae, the largest family among flowering plants, which includes 25,000 species from 850 genera. Orchids’ species are expected to approximately 2500-3000 exist in Borneo forest [2]. Mostly, orchids live as epiphytes in the tress at the forest in their essential territory. Harapan Rain Forest has been damaged caused by the increasing of logging of both legally or illegally and wild forest fires. The orchid’s extinction is the effect of a new agriculture establishing repeatedly by burning and logging illegally as well as wild forest fires. There are also economic factors contributing to the endangerment of indigenous orchids such as illegal collecting and selling of wild orchids by collectors (orchid lovers). These conditions point to the urgency of the need to conserve native orchids in Harapan Rain Forest.

Orchids can be divided into natural orchid (indigenous) and hybrid orchids (cultivars). Indigenous orchids are orchids from their natural habitat in the wild (forest), while hybrid orchids are the result of cross-breeding between species. In the world there are estimated to ± 800 genera, which belong to the category of natural orchids estimated at 25,000 species, while the hybrid orchid estimated 10,000 species [3]. Indonesia has about 5,000 species of natural orchids [4]. The diversity of orchids on the island of Sumatra have identified as many as 1,118 species, 41% of them believed to be endemic orchids of Sumatra [5].

Jambi forest area is a hotspot for natural orchids [3]. Research conducted by [5] in the Botanical Garden Bukit Sari found about 26 species of orchids. The next [6] found 20 species of orchids in the Gunung Tujuh National Park Kerinci Seblat. Research conducted by [7] at Resort Sungai Rambut National Park Berbak find 30 species of orchids.

The forest area in Jambi Province is where the growth of natural orchids [3]. Research conducted by [5] in the Bukit Sari Botanical Garden found 26 species of orchids belonging to 20 genera consisting of 15 species of epiphytic orchids and 11 species of soil orchids. In addition, a similar study has also been conducted in the area of Gunung Tujuh Kerinci Seblat National Park which found 20 species of orchids consisting of 18 species of epiphytic orchids and 2 types of orchid soil [6]. Research at Sungai Rambut Resort Berbak National Park found 30 species of orchids which are all epiphytic orchids [7].

The research about the exploration of Orchid in some protected forest have been done. [8] found about 34 species of Orchids that composed of 14 genus in Rawa-Rawang Sungai Simpang Anak Sungai Pijoan. This Orchids as epiphytes, lithophytes and saprophytes. [9] also found the Orchids about only 3 species in Education Forest in Reki, it caused by fired forest at that time. This place was threaten by illegal logging dan forest fire, so it is necessary to save the orchids biodiversity by doing exploration and cultivating the Orchids from HRF.

Natural forest areas are in Jambi, including Harapan rain forests is estimated to save different types of the orchids that have not been revealed. Given the high rate of deforestation through illegal logging and forest fires, it is feared there will be loss of large trees as a habitats of some epiphytic and terrestrial orchids. Based on this background, there should be study with the title: Inventarization and Conservation of Indigenous Orchids in the Harapan Rain Forest (HRF) Jambi Province. The aim this research is to study about diversity of orchids in Harapan Rain Forest in Jambi Province.

2. Materials and methods

This reasearch was conducted in Harapan Rain Forest on July to October 2017. The samples are collected from the forest by making a track along the street and about 10 m of the left and right side of road and entry to the forest. The samples are recorded the ecological data (epiphytes or terrestrial or lithophytes, host tree, temperature, and relative humidity), and making herbarium. Then, the sample are identified based on morphological characteristics.

3. Result and discussion

The result of this research showed that there are about 16 species are found in Harapan Rain Forest Jambi Province. Some of them are lived as epiphytes and only one species that live both
epiphyte and terrestrial, namely: *Gramatophyllum speciosa* Bl. and also one species lived as terrestrial orchid, namely: *Bromheadia finlaysioniana*. Those species are present in Table 1 as below:

| No. | Name of Species | Habitat  | Temperature (ºC) | Relative Humidity (%) | Plant Host |
|-----|-----------------|----------|------------------|-----------------------|------------|
| 1.  | *Bromheadia finlaysioniana* (lindl.) Miq. | terrestrial | 30              | 60                    | Soil       |
| 2.  | *Bulbophyllum flavescens* (Bl) Lind.    | Epiphytic | 30              | 50                    | Kempas     |
| 3   | *Bulbophyllum acutum* J.J.Sm.           | Epiphytic | 30              | 60                    | Bacang     |
| 4.  | *Bulbophyllum medusae* (Lindl.) Rchb.f. | Epiphytic | 32              | 65                    | Marpayang  |
| 5.  | *Bulbophyllum sumatranum*               | Epiphytic | 28              | 67                    | Kemang     |
| 6.  | *Bulbophyllum sp1*                      | Epiphytic | 28              | 68                    | Kemang     |
| 7.  | *Bulbophyllum sp2*                      | Epiphytic | 30              | 68                    | Marpayang  |
| 8.  | *Coelogyne plantagine* Lindl.           | Epiphytic | 30              | 54                    | Marpayang  |
| 9.  | *Coelogyne furstemannii* Rchb.f.        | Epiphytic | 30              | 60                    | Marpayang  |
| 10. | *Cymbidium bicolor* Lindl.              | epiphytic  | 30              | 65                    | Champeden  |
| 11. | *Cymbidium finlaysionum* Lindl.         | epiphytic  | 30              | 60                    | Kedondong  |
| 12. | *Dendrobium leonis* (Lindl.) Rchb.f.    | epiphytic  | 30              | 58                    | Maribungan |
| 13. | *Eria pulchella* Lindl.                 | epiphytic  | 30              | 60                    | Terap      |
| 14. | *Gramatophyllum speciosum* Bl.          | epiphyte and terrestrial | 30 | 60       | Marpayang, Soil |
| 15. | *Paphiodilum sp*                        | epiphytic  | 30              | 58                    | Bacang     |

There are 16 species of orchids that found in Harapan Rain Forest in which their representative images are presented below:
In the Table 2 indicated that there are 16 species of orchids found in Harapan Rain Forest. The species are dominated by *Bulbophyllum* with 6 species, namely: *Bulbophyllum Acutum, B.medusae, B. flavescence, B. sumatrana, Bulbophyllum sp1* and *Bulbophyllum sp2*. Only one species of orchids that lives as both an epiphyte and terrestrial namely *Gramatophyllum speciosum Bl*. The species of *G. speciosum Bl* are categorized as endangered species because some of the trees as habitat of orchids was damaged by a big forest fire in 2015. Some of them are falling down from the dead trees. In addition, most people explored and exploited the orchids for trading. On the other hand there is still no obvious plan to do some conservative acts. So, these species are endangered and some of them may have not yet been found or discovered, because of the loss of habitat resulting from fire, forest damage, illegal logging, and orchid hunting either by domestic or foreign collectors. Until recently, there are only a few records on the orchid native to Harapan Rain Forest in Jambi Province. Comparing with previous authors [9], who only found as much as 12 species, that may be caused by differences in exploring time as well as duration and specific site for surveying. Some trees may also have been damaged by previous disturbance. Based on our result, we need to do further research about how to do the conservation of orchids and restore the native habitat.

4. Conclusion

Based on this research, the orchids have been collected from Harapan Rain Forest Jambi Province about 16 species. The species are dominated by *Bulbophyllum*, namely: *Bulbophyllum acutum, B.medusae, B. flavescence, B. sumatrana, Bulbophyllum sp1* and *Bulbophyllum sp2*. Only one species of orchids that lives as both an epiphyte and terrestrial namely *Gramatophyllum speciosum BL*. *G. speciosum* become endangered, because some of tree as a habitat are lost by forest fire and human trafficking by exploring without doing any conservative acts. It is necessary to conduct and plan some the conservation strategy for the orchids for sustainable ecosystem of Harapan Rain Forest.
Acknowledgments
The authors would like to express the highest gratitude to DFG (Deutsche forschungs gemeinschaft) for funding this research of EFForTS, to ABS Fund Coordinator CRC990 in Indonesia, to Project Partner in Georg August University Goettingen, Prof. Dr. Stefan Scheu and to PT. Reki Jambi Province.

References
[1] Anonim 2009 109 Spesies terancam punah https://sains.kompas.com/Kompas.com/Sains
[2] Irawati 2002 Proceeding of Indonesian Orchid Seminar (Yogyakarta)
[3] Anonim.2010a Profile of hutan harapan Jambi http://harapanrainforest.blogspot.com/
[4] Anonim 2010b Tanaman hias anggrek http://infokehutananjambi.or.id/?v=pr&id=48
[5] Siregar C, Listiawati A and Purwaningsih 2005 Anggrek Spesies Kalimantan Barat Volume I (Pontianak: Lembaga Penelitian dan Pengembangan Pariwisata Kalimantan Barat (LP3-KB))
[6] Puspitaningtyas D M 2002 Biosmart 4.55
[7] Sova W M 2009 (Jambi: Universitas Jambi)
[8] Pebriani E 2009 (Jambi: Universitas Jambi)
[9] Usmawati and Yelianti U 2011 (Jambi: Universitas Jambi)
[10] Susanti M, Yelianti U and Hariyadi B 2016 (Jambi: Universitas Jambi)