



CRC990

**Ecological and Socioeconomic Functions of Tropical Lowland Rain Forest
Transformation Systems Sumatera, Indonesia**

**INVENTARIZATION AND CONSERVATION OF
INDIGENOUS ORCHIDS IN HARAPAN RAIN
FOREST JAMBI PROVINCE**

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**RESEARCH
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1. BACKGROUND

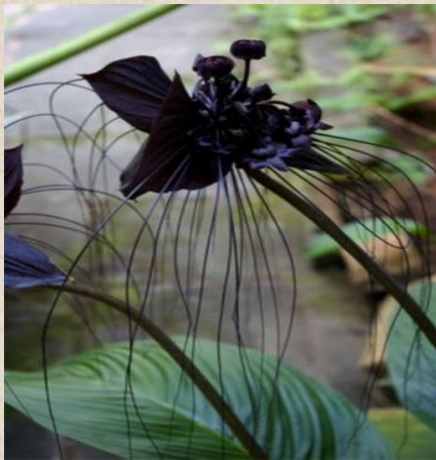
 Harapan Rain Forest (HRF) is one of the lowland tropic that located in Sumatera. HRF has an area of 98.555 ha, of which 46.385 ha is located in Jambi Province and 52 170 ha in the Province of South Sumatra.

 HRF is high biodiversity, but forest fire, illegal logging, land conversion → ecosystem was damaged → some species was threatened.

🌿 Orchids is one of the indigenous species in HRF that's endangered, it is caused by forest fire, illegal logging by the indigenous people (Suku Anak Dalam) and land conversion into palm oil plantation.

🌿 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.

In HRF in Jambi Province showed that there are hundred plants and animals, but around 109 of them are **threatened** → because the density of trees are less by a big fire forest in 2015, illegal logging and land conversion into oil palm plantation. It's mean that loss of the habitats of many kinds of animals and plants (Anonim, 2009).



***INDEGENOUS
ORCHIDS***



ORCHIDS

- ❁ is an esthetic plants with high price → very beautiful flower and interested by most people → cultivate and trading
- ❁ Indegenous Orchids is the orchids that growth in natural habitat in the forest as a wild plants, while the hybrides orchids is come from hibridation between two or more species (Anonim, 2010)
- ❁ In the world there are ± 800 ordo of Orchids, including native orchids is about 25.000 species, while the hybrides orchids about 10.000 species.
- ❁ Indonesia have about 5.000 species of native orchids (Siregar, et all., 2005). The biodiversity of orchids in Sumtera have identified about 1.118 species, 41% among of them rely on as an endemic orchids in Sumatera (Puspitaningtyas, 2002).







Problem of this research

Indigenous Orchids ???





Inventarization and Conservation




Goal of this Research

1. to know the species of indigenous orchids in HRF (first year)
2. To do the conservation by using tissue culture technique (second year) → return to HRF

METHODS:

-  This research was arranged into two years:
First year: exploration and inventarization of indigenous orchids from HRF.
-  Survey location: 2 location
 - in primery forest
 - in secondary forest
-  Samples collection → herbarium & fresh → for the next step
-  Identification by using the guidance book of orchid identification → Orchids in Jambi Province and other literatures (Handy Pocket of Orchids in Indonesia)

 **The next step (2nd year) :
Conservation of orchids by using
tissue culture technique**

Treatments:

- **the source of explant : shoot, root, pollen, etc.**
- **growth medium**
- **many kind of Plant Growth Hormone**
- **Dose of Plant Growth Hormone.**


**Plantlet that produced from tissue
culture will return to the native habitat
(in situ) → conservation.**

RESULT AND DISCUSSION

Table 1. The ecological data of species of Orchids that found in HRF

No.	Name of Species	Habitat	Tempreture (°C)	Relative Humidity (%)	Plant Host
1.	<i>Bromheadia finlaysoniana</i> (lindl.) Miq.	terresterial	30	60	Soil
2.	<i>Bulbophyllum flavesences</i> (Bl) Lindl.	Epiphytic	30	50	Kempas
3	<i>Bulbophyllum acutum</i> J.J.Sm.	Epiphytic	30	60	Bacang
4.	<i>Bulbophyllum medusae</i> (Lindl.) Rchb.f)	Epiphytic	32	65	Marpayang
5.	<i>Bulbophyllum sumatranum</i>	Epiphytic	28	67	Kemang
6.	<i>Bulbophyllum sp1</i>	Epiphytic	28	68	Kemang
7.	<i>Bulbophyllum sp2</i>	Epiphytic	30	68	Marpayang
8.	<i>Coelogyne plantagine</i> Lindl.	Epiphytic	30	54	Marpayang
9.	<i>Coelogyne furstemannii</i> Rchb.f.	Epiphytic	30	60	Marpayang
10.	<i>Cymbidium bicolor</i> Lindl.	epiphytic	30	65	Champeden
11.	<i>Cymbidium finlaysianum</i> Lindl.	epiphytic	30	60	Kedondong
12.	<i>Dendrobium leonis</i> (Lindl.) Rchb.f.	epiphytic	30	58	Maribungan
13.	<i>Eria pulchella</i> Lindl.	epiphytic	30	60	Terap
14.	<i>Gramatophyllum speciosum</i> Bl.	epiphyte and terresterial	30	60	Marpayang, Soil
15.	<i>Paphiodilum sp</i>	epiphytic	30	58	Bacang

Table 2 . Description of species Orchids that found in Harapan Rain Forest

No.	Sample	Classification
1.	 <p data-bbox="183 778 888 899"><i>Bromheadia finlaysoniana</i> (Lindl.) Rchb.f.</p>	<p data-bbox="908 264 1246 314">Classification:</p> <p data-bbox="908 335 1323 385">Kingdom : Plantae</p> <p data-bbox="908 406 1477 456">Divisi : Spermatophyta</p> <p data-bbox="908 478 1468 528">Class : Angiospermae</p> <p data-bbox="908 549 1371 599">Ordo : Gynandae</p> <p data-bbox="908 621 1420 671">Family : Orchidaceae</p> <p data-bbox="908 692 1410 742">Genus : Bromheadia</p> <p data-bbox="908 763 1719 899">Species : <i>Bromheadia finlaysoniana</i> (Lindl.) Rchb.f)</p>
<p data-bbox="183 921 1854 1192">Habitat: is terrestrial orchids that thrives among the reeds or bushes in the open forest with the full sunlight. Often found in marginal soil or on the edge of the forest that has been opened. Found in Harapan rain Forest Jambi Province.</p> <p data-bbox="183 1206 1854 1413">Description: stem erect, with 70 – 200 cm tall. Leaves is oval elongated. Inflorescences arise from the top of segments, 15 cm long, rarely branched, consisting of 1 – 2 flowers that bloom simultaneously.</p>		

2. *Bulbophyllum acutum* J.J Sm.



.Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Bulbophyllum*

Species : *Bulbophyllum acutum* J.J Sm.

Habitat : epiphytic orchids with pseudobulb. Live on tree plant bacang in the forest.

Description: short, pseudobulbs place close together. Pseudobulbs ovate, strong ribbed, slightly flattened, it's bearing a single leaf. Leaves are lanceolate, acute, thin with 2-3 cm long. Flower inflorescences.

3. *Bulbophyllum flavescens*



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Bulbophyllum*

Species : *Bulbophyllum flavescens*

Habitat: epiphytic orchid that grows on tree plant. Found on Terap plant in Harapan Rain Forest Jambi Province.

Description: Pseudobulb almost invisible. Petiole directly attached to the rhizome. Rhizome are short and pseudobulb is very small. Sympodial growth on the tree in lowland or highland. Inflorescence arises from the growth of the new shoot, shaped bunches.

4. *Bulbophyllum sumatranum*



. **Classification:**

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Bulbophyllum*

Species : *Bulbophyllum
sumatranum*

Habitat: epiphytic orchids on Terap tree in Harapan Rain Forest Jambi Province.

Description: epiphytic orchids that grows on the tree trunk or main branches in the rain forest. Growing simpodial wiyh pseudobulbs is about 5cm between each other.

5. *Bulbophyllum medusae*



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Bulbophyllum*

Species : *Bulbophyllum medusae* (Lindl.)

Rchb.f

Habitat: epiphytic on Marpayang tree in Harapan rain Forest Jambi Province.

Description: epiphytic Orchids, its pseudobulb, are spaced about 4 cm apart and up to 4 high. The single leaf is up to 20 cm tall with a moplike head of many flowers, each about 15 cm long.

6.

Bulbophyllum sp1



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Bulbophyllum

Species : *Bulbophyllum sp1*

Habitat: epiphytic orchids. Found at Marpayang plant in Harapan Rain Forest Jambi Province.

Description: *Bulbophyllum sp1* is an epiphytic orchid that grow monopodial with pseudobulb like *Bulbophyllum medusae* but the leave more green. Every bulb have only one leave. Inflorescences with five to ten flowers in an umbel.

7. *Bulbophyllum sp 2*



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Bulbophyllum*

Species : *Bulbophyllum sp2*

Habitat: epiphytic orchids on tree plant of kemang in Harapan Rain Forest Jambi Province.

Description: is an epiphytic orchids, attached to the main stem of host plants. Rhizome creeping long, thin and branching, with pseudobulbs. Leaves oblong – lanceolate, and obtuse.

8. *Coelogyne furstemannii*
Rchb.f.



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Coelogyne*

Species : *Coelogyne*

furstemannii *Rchb.f.*

Habitat: usually epiphytic orchids on Marpayang tree in Harapan Rain Forest.

Description: is a sympodial orchids which are usually epiphytic. Pseudobulb are large and conspicuous which each bears of either one or two leaves. Inflouescences are always terminal. Flower are usually large and fragrant. Lip usually trilobed.

9.

Coelegyne plantagine Lindl.



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Coelegyne

Species : *Coelegyne plantagine* Lindl

Habitat: Epiphytic in tree plants. Found in Harapan Rain Forest Jambi Province. **Description:** The color of green leaves, ovate, the apex rounded, but shortly acuminate. This Orchids have flowers that are green or white. The pseudobulb is 2-4 cm apart on the creeping rhizome either near or far apart, the leaves are 2 or 3 strands, wide or round. The inflorescence system is perpendicular or reluctant to some or more flowers. The leaves of the petals are usually very sunken, the leaves of the flower petals are narrower than the petals. Flower lips slightly curved to the bottom. There are three lobes, the widening edge of the lobe gradually from the bottom of the flower lips and also perpendicular to the edge of the column.

10. *Cymbidium finlaysonianum* Lindl.



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Cymbidium

Species : *Cymbidium finlaysonianum*
Lind

Habitat: epiphytic orchids, but sometime are lithophyte. Grow on tree in lowland forest. Found in Harapan Rain Forest Jambi Province.

Description: Pseudobulb hidden behind leaf bases, flattened, each bearing about 5 leaves. Leaves thick and hard, variable in length but average about 70x4.5 cm. The apex with obtuse lobed. Inflorescences hanging loosely down, up to 1 meter long and bearing about 30 flowers.

11 *Dendrobium leonis* (Lindl.)



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Dendrobium

Species : *Dendrobium leonis*
(Lindl.)

Habitat: epiphytic orchid. Found in *Arthocarpus champeden* (cempedak) in Harapan Rain Forest Jambi Province.

Description: simpodial without pseudobulbs. Stems up to 25 cm, bearing many leaves. Leaves thick about 1.5 – 2 cm long and 1 cm broad. Inflorescence flowers arise from the apex of the stem, bearing 1 – 2 flowers.

12. *Eria pulchella* Lindl.



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Eria*

Species : *Eria pulchella* Lindl.

Habitat: is an epiphytic orchids that creep all over the small trees on Harapan Rain Forest in Jambi Province.

Description: rhizomes creeping all over a long distance, growth of simpodium placed about 15 cm apart. Stem thickened into pseudobulbs formed from a single internode, 10 cm long by 2 cm broad, somewhat flattened and angular. Leaves thick in texture, broadly oblong, with slightly uneven obtuse apices. Inflorescence mostly terminal, 1-3 to a stem, shorter than the leaves, bearing 15 flowers.

13. *Gramatophyllum speciosum*



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Gramatophyllum

Species : *Gramatophyllum speciosum*

Habitat: found as terrestrial or epiphytic on tree in Harapan Rain Forest.

Description: pseudobulbs formed into long stem, the longest to 7m, but usually only 3 m, at first erect, later hanging down with leaves into 2 rows along their length when young, dropping to the base when older. Leaves linear, acute from 0.5 to 1 m long by 3 cm broad. Inflorescence about 2m in long, many flowers.

14. *Cymbidium finlaysonianum* Lindl.



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Cymbidium

Species : *Cymbidium finlaysonianum*
Lindl.

Habitat: epiphytic orchids, but sometime are lithophyte. Grow on tree in lowland forest. Found in Harapan Rain Forest Jambi Province.

Description: Pesudobulb hidden behind leaf bases, flatenned, each bearing about 5 leaves. Leaves thick and hard, variable in length but average about 70x4.5 cm. The apex with abtuse lobed. Ibflorences hanging loosely down, up to 1meter long and bearing about 30 flowers.

15. *Papiodilum sp*



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : *Papiodilum*

Species : *Papiodilum sp*

Habitat: usually live terrestrial, sometimes epiphytic. Found in Bacang tree in Harapan rain Forest Jambi Province.

Description: Short stems covered by midrib. Leaves out of the base of the stems in 2 rows, sometimes fringing. Compound interest in the form of clusters with 1 or several flowers on each bunch, the bottom two petals are attached to each other behind the lip, the crown is usually narrower and longer than the petals, sometimes on the edges there are warts, feathers or both. The central curve of the lips is pocket-shaped, while the curve at the edges is small and wavy. 2nd year.

16. *Cymbidium bicolor* Lindl.



Classification:

Kingdom : Plantae

Divisi : Spermatophyta

Class : Angiospermae

Ordo : Gynandae

Family : Orchidaceae

Genus : Cymbidium

Species : *Cymbidium bicolor* Lindl.

Habitat: epiphytic orchids. Grow on tree in lowland forest. Found in Harapan Rain Forest Jambi Province.

Description: Pseudobulb hidden behind leaf bases, flattened, each bearing about 5 leaves. Leaves thick and hard, variable in length but average about 70 x 4.5 cm. The apex with obtuse lobed. Inflorescences hanging loosely down, up to 1 meter long and bearing about 30 flowers.

CONCLUSION:

Based on this research, the orchids have been collected from Harapan Rain Forest Jambi Province about 16 species.

The are 16 species have collected in HRF. The species are dominated by ordo 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 speciosumBl.*

G. speciosum become endangered, because some of tree as a habitat are lossed by forest fire and human trafficking by explored without doing conservation.

It is necessary to do the conservation of orchids for sustaible ecosystem of Harapan Rain Forest.





Fig. 1 Fresh samples

Thank you ...
Wassalam wr wb ...

- 🌳 Harapan Rain Forest (HRF) is one of the lowland tropic that located in Sumatera → Jambi Propvince and South Sumatera (Sumsel)
- 🌳 HRF has an area about 98.555 ha → about 46.385 ha is located in Jambi Province and 52.170 ha in the province of South Sumatra.
- 🌳 The total area of $\pm 101,000$ ha of forest conservation.
- 🌳 HRF is also high in biodiversity both flora and fauna, like : mamalia, aves, fish, etc.
- 🌳 In 1900 the area is about 16 billion ha, but nowadays only about 500 ha.
- 🌳 HRF as a habitat: ± 425 Aves, 119 species of mamalia, 82 species of Amphibi, 17 ordo of endemic plants.