

**TITLE**  
HIGH CONSERVATION VALUE AREA (HCVA)  
HCV 1.2: RAFFLESIA MONITORING



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## **BACKGROUND**

In January 2016, a group of survey crew under the Forest Management Certification (FMC) Unit had found an area with the occurrence of Rafflesia clusters while establishing the Permanent Sample Plot (PSP) No.7 in Coupe 12A. The distribution of the Rafflesia was found in cluster within 1-3 meter radius. However, no further assessment or monitoring has been done up until 30<sup>th</sup> January 2020, which is the first assessment done by the FMC Conservation Unit. A buffer zone of 50 meter radius had been established during the assessment day, the High Conservation Value (HCV) signage had been erected on 3<sup>rd</sup> February 2020, and a stakeholder consultation had been done on 9<sup>th</sup> March 2020 with the community of Pa' Berunut.

## **INTRODUCTION**

The Rafflesia is categorized as a Totally Protected Plant in Wild Life Protection Ordinance (WLPO) 1998. It is a parasitic plant in the family Rafflesiaceae that lives-off on the root of host plant called Tetrastigma vine (which comes from the genus *Tetrastigma* from the family Vitaceae, the same family with grape) (Plants of the World online, 2020). The flower bud on the root of host plant spent 8-9 months to full bloom (Suphuntee N. et al., 2000). As a mean to protect the Rafflesia found in Ravenscourt FMU, a buffer zone has been established. Monitoring had been done for several times to collect more information about the Rafflesia. Information such as the condition of the area, elevation, weather, and the Rafflesia itself which includes the morphological characteristics of the flower, are important to be able to identify its species. Monitoring had been done three times after the first assessment which is on 20<sup>th</sup> May 2020, 26<sup>th</sup> May 2020 and 29<sup>th</sup> May 2020.

## **SITE DESCRIPTIONS**

Location : Coupe 12A  
Coordinates : N 04° 05' 08.3"  
                  E 115° 27' 16.8"  
Elevation : 1193 meter above sea level  
Topography : Concave



## **PERSONNEL INVOLVED**

### **20<sup>th</sup> May 2020**

1. Ophelia Eda Alexander Treang
2. Racheal anak Rosedy
3. Samuel Nuh
4. Elviana Ritchie

### **26<sup>th</sup> May 2020**

1. Ophelia Eda Alexander Treang
2. Racheal anak Rosedy
3. Frazier anak Parose
4. Christly Bian Dawat

### **29<sup>th</sup> May 2020**

1. Ophelia Eda Alexander Treang
2. Samuel Nuh
3. Christopher Agong
4. Alen Kalingan
5. Clarence Udan John

## FIRST MONITORING

Date : 20<sup>th</sup> May 2020  
Day : Wednesday  
Time : 0835hrs – 0950hrs  
Weather : Cloudy, Sunny

On our first monitoring, we had found one mature Rafflesia bud, along with some other Rafflesia remains and a couple of Rafflesia buds which are still in their dormancy phase.



Figure 1: Mature Rafflesia bud. (*Photo by Ophelia Eda*)



Figure 2: Some of the Rafflesia remains. (Photos by Ophelia Eda)



Figure 3: Dormant Rafflesia bud 1. (Photo by Ophelia Eda)



Figure 4: Dormant Rafflesia bud 2. (Photo by Ophelia Eda)

## SECOND MONITORING

Date : 26<sup>th</sup> May 2020  
Day : Tuesday  
Time : 0930hrs – 1045hrs  
Weather : Cloudy, Sunny

On our second monitoring, the mature Rafflesia bud was in its blooming phase. However, it had not bloomed completely. We had collected some information on its morphological characteristics during this time.



Figure 5: Blooming Rafflesia (aerial view). (Photo by Ophelia Eda)



Figure 6: Blooming Rafflesia (side view). (Photo by Racheal Rosedy)



Figure 7: Blooming Rafflesia (side view). (Photo by Ophelia Eda)

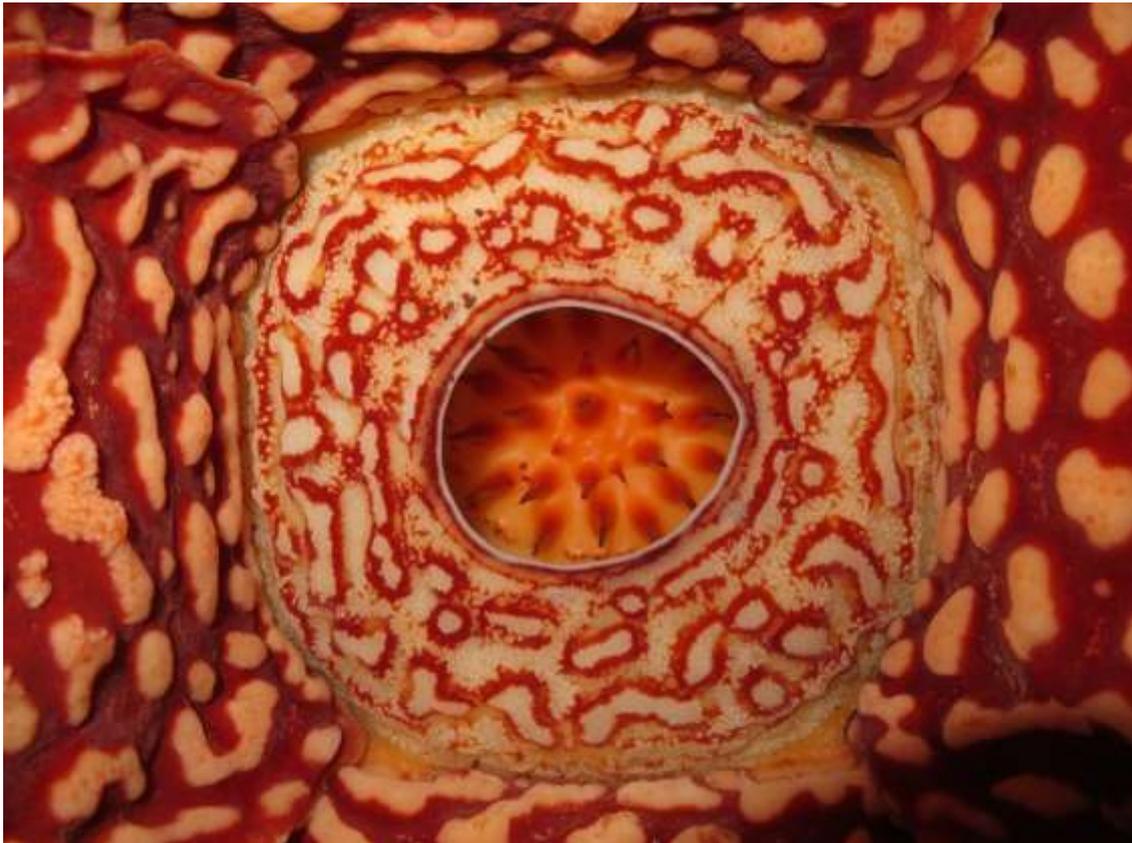


Figure 8: Close-up view of Rafflesia petal tube/perigone tube. (Photo by Ophelia Eda)

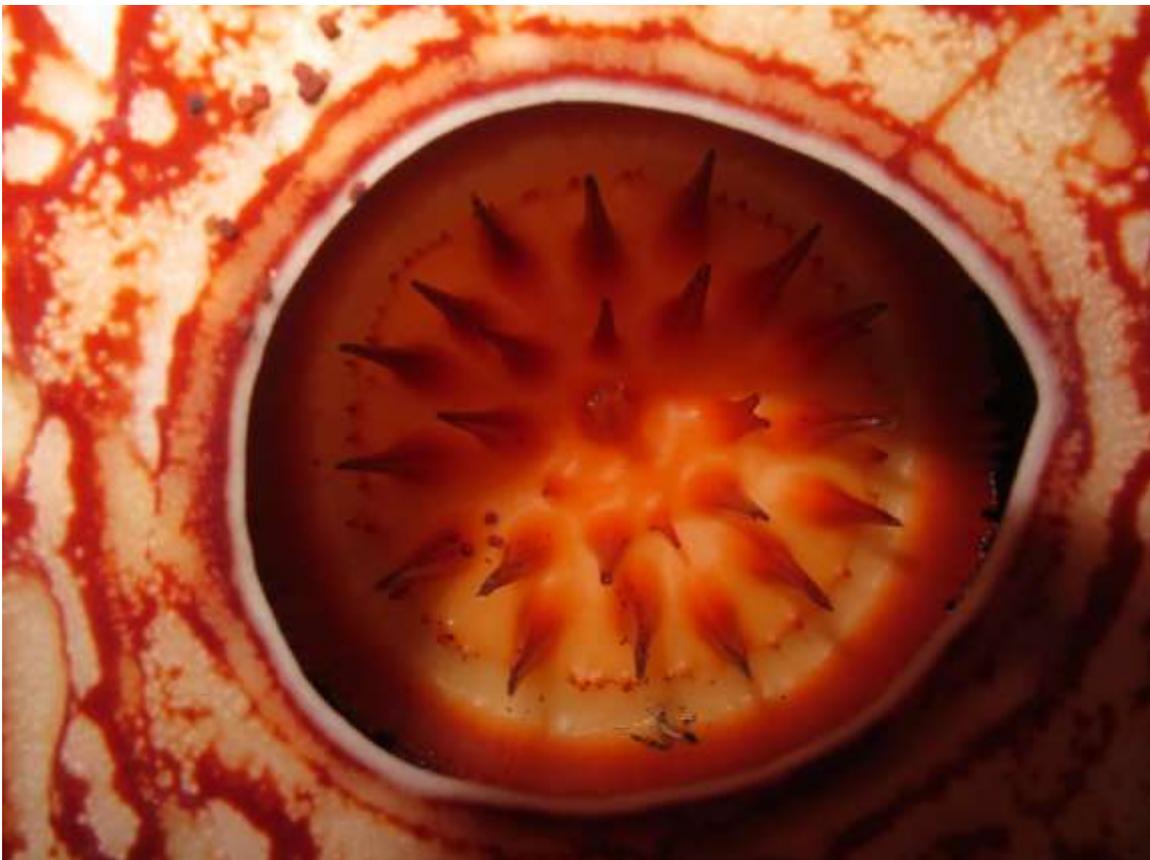


Figure 9: Close-up view of Rafflesia central disk. (Photo by Ophelia Eda)

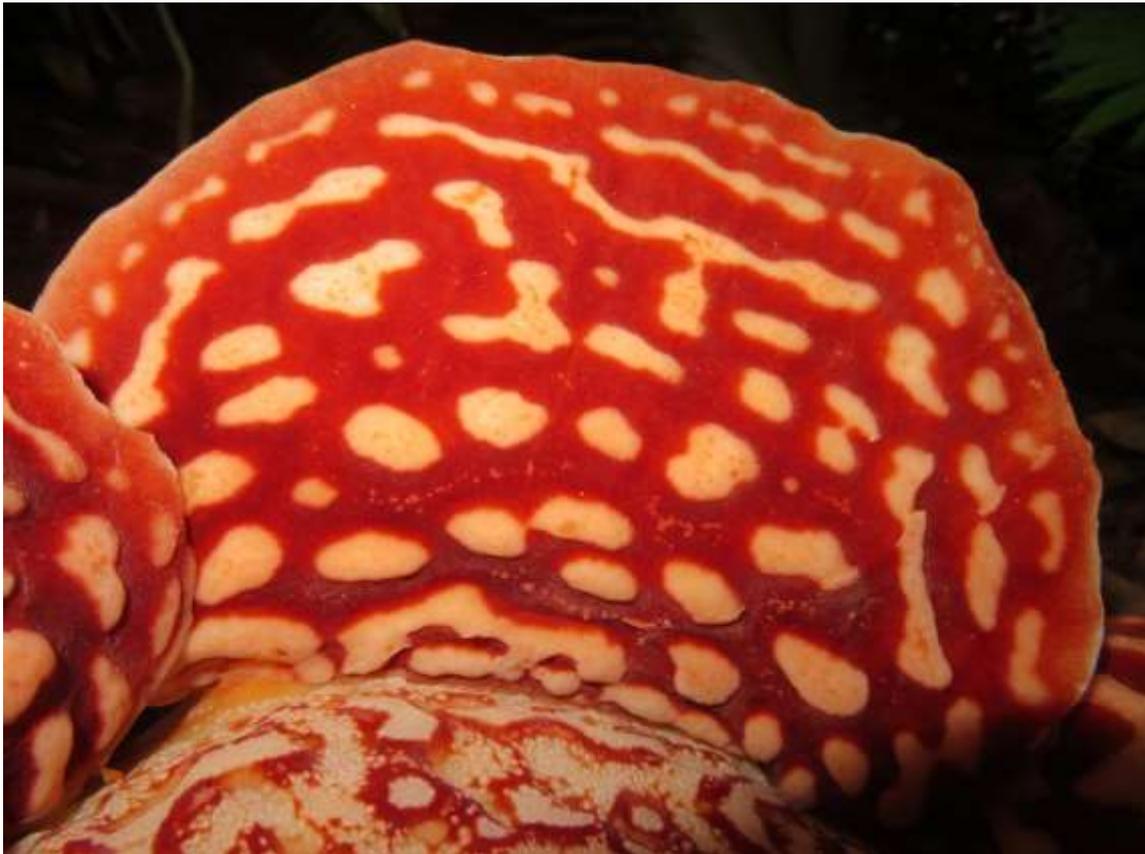


Figure 10: Close-up view of Rafflesia petal. *(Photo by Ophelia Eda)*



Figure 11: Ophelia was measuring the size of the Rafflesia. *(Photo by Racheal Rosedy)*



Figure 12: Ophelia was measuring the petal of the Rafflesia. (Photo by Racheal Rosedy)



Figure 13: Ophelia was recording the measurement of the Rafflesia.  
(Photo by Racheal Rosedy)

### THIRD MONITORING

Date : 29<sup>th</sup> May 2020  
Day : Friday  
Time : 0935hrs – 1100hrs  
Weather : Cloudy

On our third monitoring, the Rafflesia was fully blooming. Also, we had found another Rafflesia remain and a new bud.



Figure 14: Fully bloomed Rafflesia. (Photo by Ophelia Eda)



Figure 15: Rafflesia remain. (Photo by Ophelia Eda)



Figure 16: New Rafflesia bud. (Photo by Ophelia Eda)

## MORPHOLOGY OF THE RAFFLESIA

Morphology of the Rafflesia is the study of morphological or structural characteristics of the Rafflesia, such as the number of petal, colour, shape, size, etc. It is an important element in order to identify the species of the Rafflesia. We had recorded the external morphological characteristics of the Rafflesia during our second monitoring as shown below:

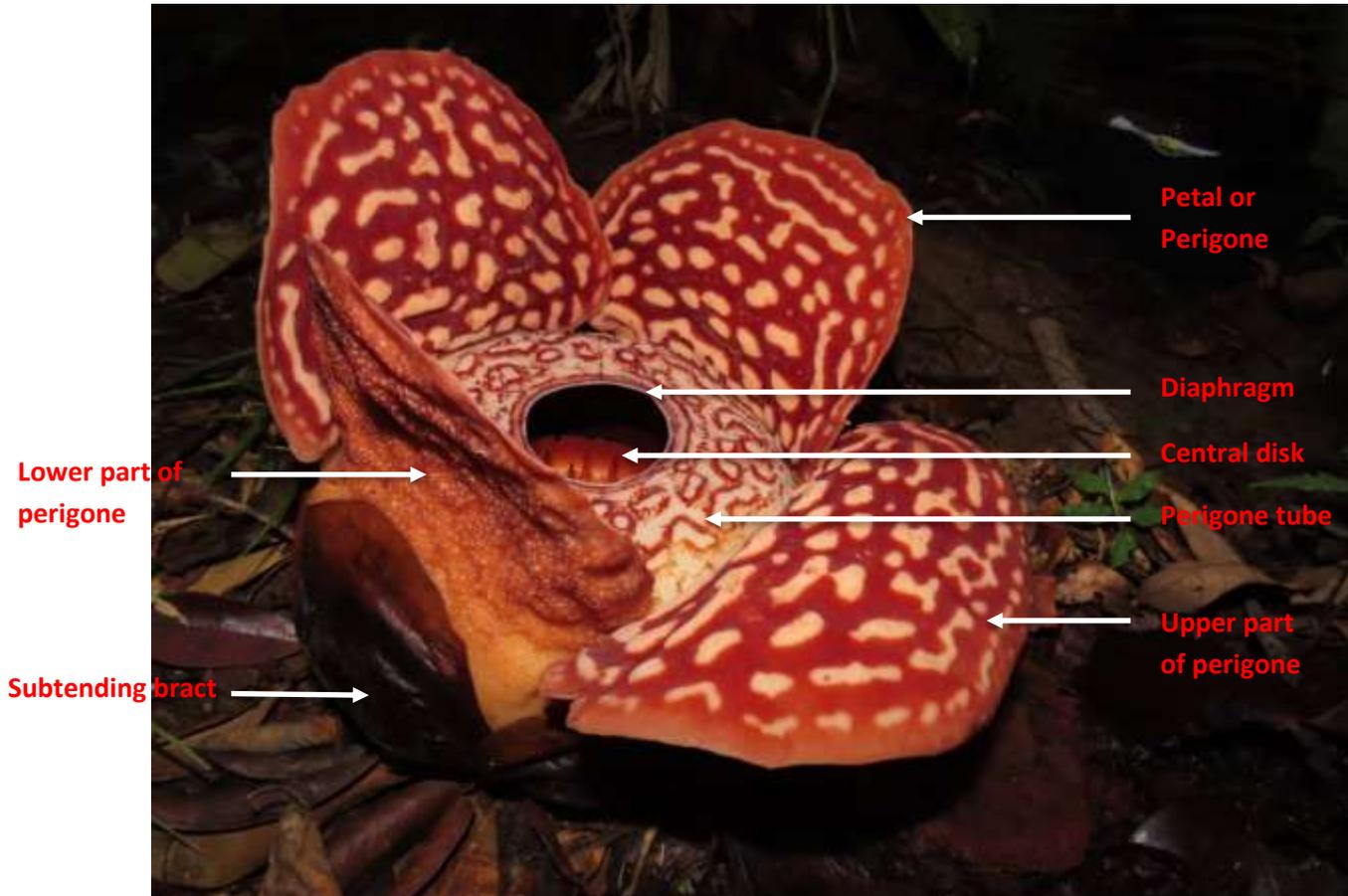


Figure 17: Rafflesia morphological characteristics.

Number of petal/perigone	: 4
Colour of perigone	- Upper part: Reddish-brown with the appearance of whitish warts - Lower part: Reddish-brown with the appearance of whitish dots
Surface of perigone	- Upper part: Hard and rough with warts - Lower part: Hard and smooth with craters
Colour of perigone tube	- Outer: Yellowish - Surface: Whitish with reddish-white wart-like structures
Surface of perigone tube	- Outer: Smooth - Surface: Less rough than the upper perigone surface
Colour of central disk	: Yellowish with reddish thorns/processes on top
Number of subtending bract	: 4
Colour of subtending bract	: Dark brown

Table 1: Rafflesia morphological characteristics.

Figure 18: Structure of perigone tube.



Perigone

Perigone tube

Central disk

Thorns or Processes

Wart

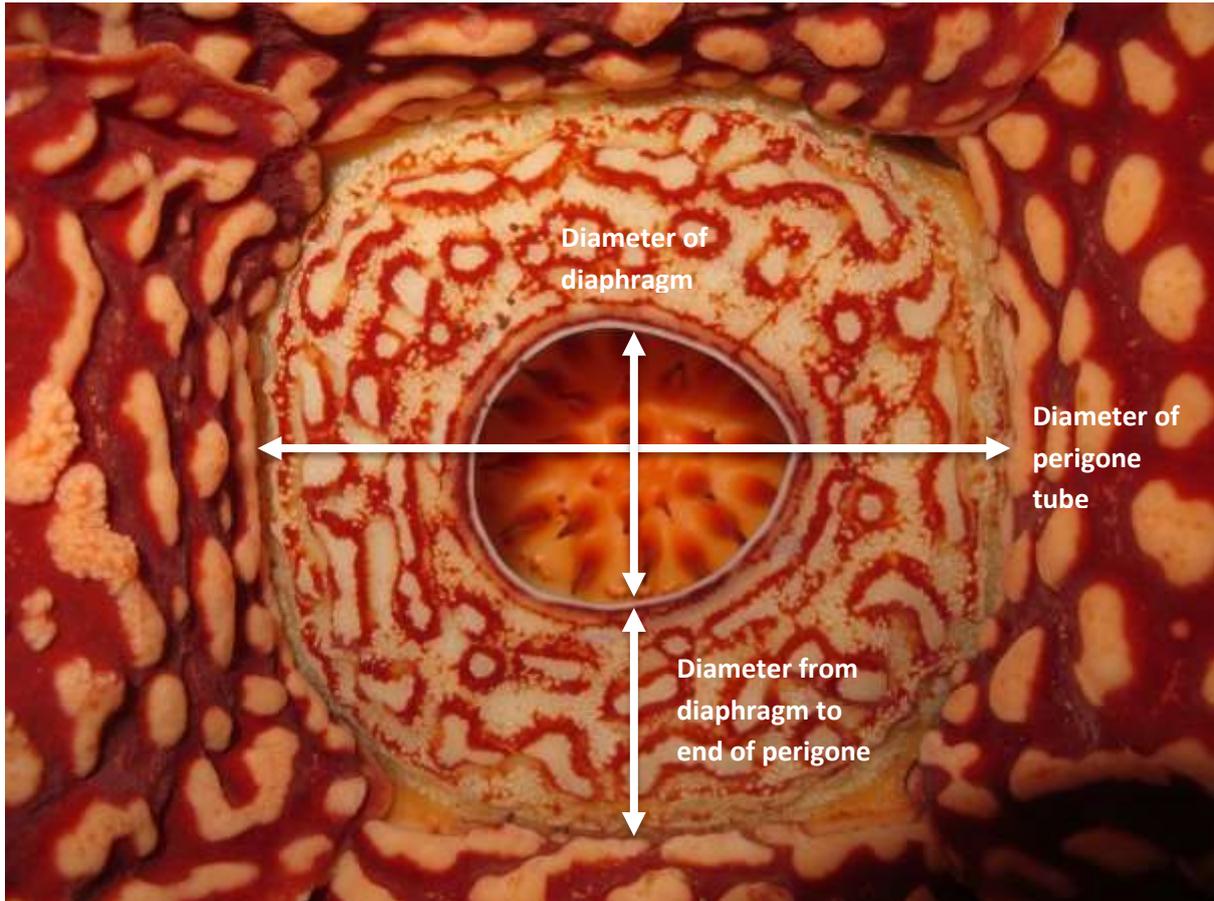


Figure 19: Perigone tube measurements.

Measurements (cm)	
Diameter of perigone tube	: 16 cm
Diameter of diaphragm	: 5.5 cm
Diameter from diaphragm to end of perigone	: 5.5 cm

Table 2: Perigone tube measurements.

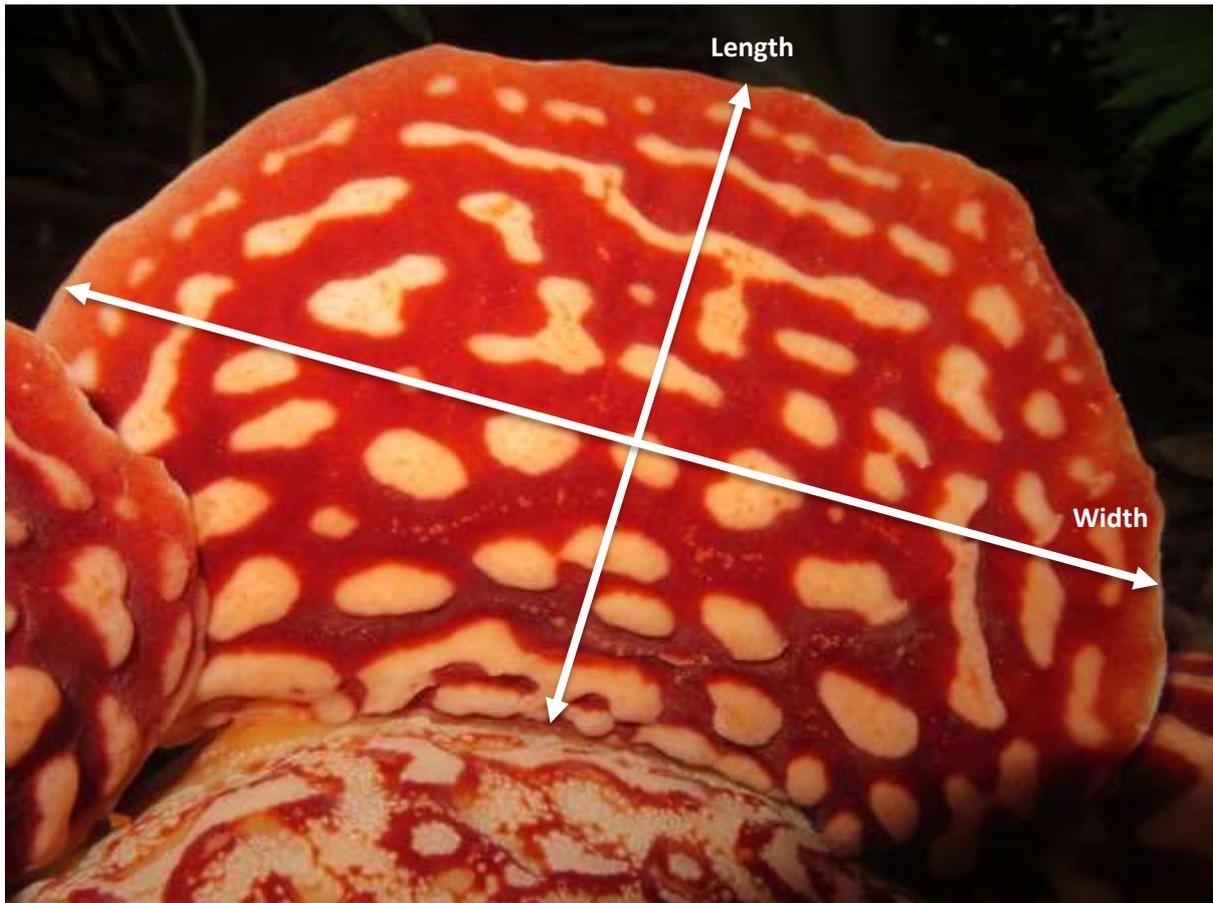


Figure 20: Perigone measurements.

Measurements (cm)	
Perigone 1	- Width: 15.2 cm - Length: 11.5 cm
Perigone 2	- Width: 16 cm - Length: 12 cm
Perigone 3	- Width: 17.5 cm - Length: 12 cm
Perigone 4	- Width: 14 cm - Length: 11.5 cm
Average	- Width: 14 cm – 17.5 cm - Length: 11.5 cm – 12 cm

Table 3: Perigone measurements.

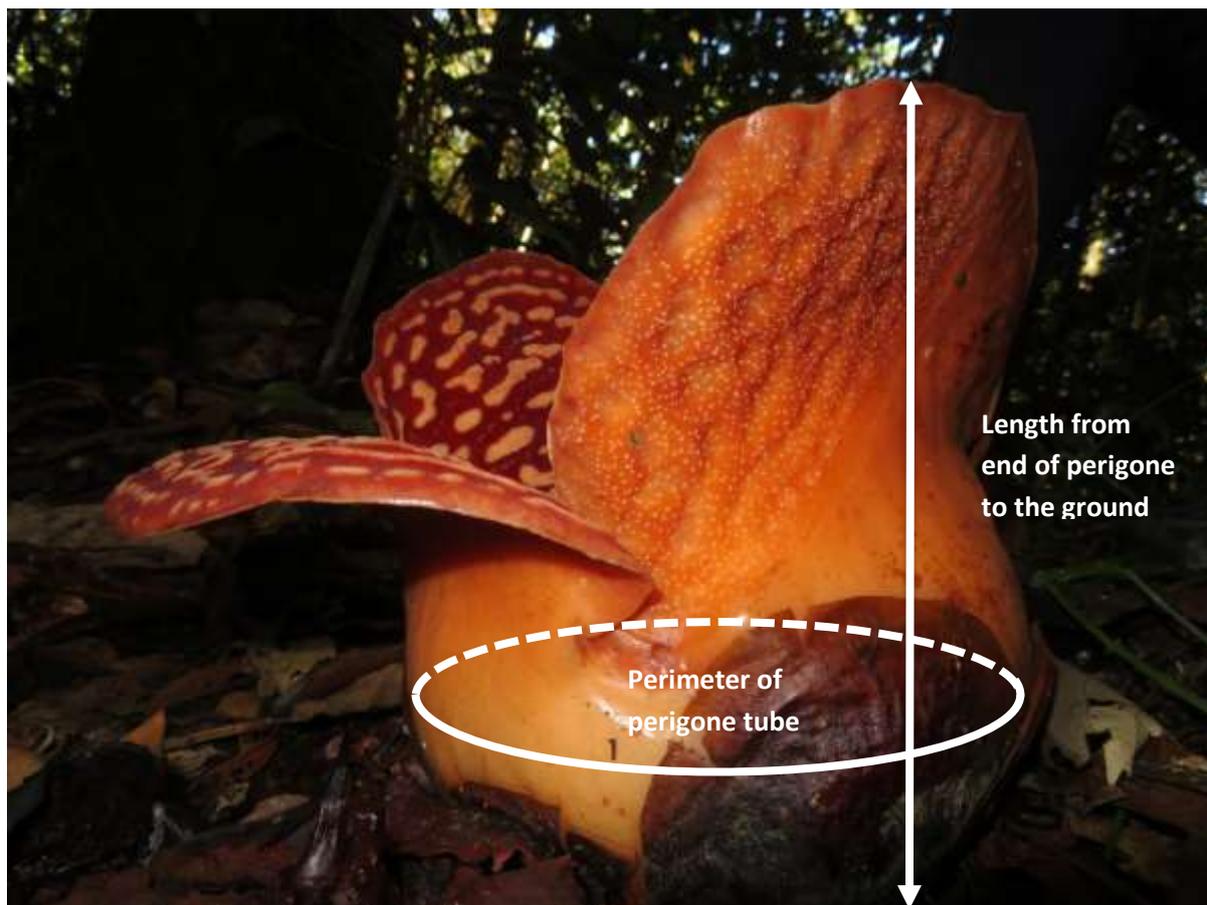


Figure 21: Outer part measurements.

Measurements (cm)	
Perimeter of perigone tube	: 57 cm
Length from end of perigone to the ground	: 22 cm

Table 4: Outer part measurements.

## SUMMARY

First Discovery	: January 2016
First Assessment	: 30 <sup>th</sup> January 2020
Buffer Zone Establishment	: 30 <sup>th</sup> January 2020
HCV Signage Establishment	: 3 <sup>rd</sup> February 2020
HCV Stakeholder Consultation	: 9 <sup>th</sup> March 2020
First Monitoring	: 20 <sup>th</sup> May 2020
Second Monitoring	: 26 <sup>th</sup> May 2020
Third Monitoring	: 29 <sup>th</sup> May 2020

### RAFFLESIA MORPHOLOGICAL CHARACTERISTICS

Number of petal/perigone	: 4
Colour of perigone	- Upper part: Reddish-brown with the appearance of whitish warts - Lower part: Reddish-brown with the appearance of whitish dots
Surface of perigone	- Upper part: Hard and rough with warts - Lower part: Hard and smooth with craters
Colour of perigone tube	- Outer: Yellowish - Surface: Whitish with reddish-white wart-like structures
Surface of perigone tube	- Outer: Smooth - Surface: Less rough than the upper perigone surface
Colour of central disk	: Yellowish with reddish thorns/processes on top
Number of subtending bract	: 4
Colour of subtending bract	: Dark brown

### MEASUREMENTS (CM)

#### PERIGONE TUBE

Diameter of perigone tube	: 16 cm
Diameter of diaphragm	: 5.5 cm
Diameter from diaphragm to end of perigone	: 5.5 cm

#### PERIGONE

Perigone 1	- Width: 15.2 cm - Length: 11.5 cm
Perigone 2	- Width: 16 cm - Length: 12 cm
Perigone 3	- Width: 17.5 cm - Length: 12 cm
Perigone 4	- Width: 14 cm - Length: 11.5 cm
Average	- Width: 14 cm – 17.5 cm - Length: 11.5 cm – 12 cm



OUTER PART	
Perimeter of perigone tube	: 57 cm
Length from end of perigone to the ground	: 22 cm

## **CONCLUSION**

Some information on the Rafflesia, especially on its morphological characteristics had been able to be recorded. However, we have no expertise to identify the species. Therefore, we had inform Sarawak Forestry Corporation (SFC) about the Rafflesia and asked their help to identify the species. Their response is that they are planning to make a trip to Ravenscourt FMU soon to assess the Rafflesia because they are unable to identify the Rafflesia species just by looking at the pictures alone as they told us that Rafflesia with 4 petals/perigones is rare compared to the ones with 5 petals. And to find Rafflesia in the area with the elevation of more than 1000 meter above sea level is also rare, so it might be a new subspecies.

Further monitoring to get more information about the Rafflesia such as the time frame of the new bud to become fully bloomed Rafflesia, and to monitor the condition of the site is still in planning. **(refer Appendix 1)**



**APPENDIX 1 – MONITORING PLAN SCHEDULE**

ITEMS	MONTHS											
MONITORING	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Rafflesia												
Buffer Zone Marking/Paint												
HCV Signage												