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## Four New Records of Zingiberaceae in Gunung Telapak Burok, Berembun Forest Reserve (Fr), Negeri Sembilan

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# Four New Records of Zingiberaceae in Gunung Telapak Burok, Berembun Forest Reserve (Fr), Negeri Sembilan

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**Abstract.** A short survey on Zingiberaceae family was done in selected trails of Gunung Telapak Burok (1193m), Berembun Forest Reserve (FR), Negeri Sembilan. This botanical inventory for ginger family produced a list of 10 genera and 14 species, including four new records for Berembun Forest Reserve (FR) and Negeri Sembilan. Most gingers species found were from genus *Alpinia* and followed by *Globba*. *Alpinia vitellina* (Lindl.) Ridl. Four species namely *Meistera ochrea* (Ridl.) Skornick & M.F.Newman (*Amomum ochreum* Ridl.), *Camptandra ovata* Ridl., *Zingiber longibracteatum* Theilade and *Conamomum utriculosum* Ridl. (*Amomum utriculosum* (Ridl.) Holtum) were not listed during previous botanical survey and were additional new records for Berembun Forest Reserve and Negeri Sembilan. The previous record also found *Haniffia cyanescens* var. *cyanescens* which is a hyper-endemic wild ginger in Bukit Tangga. In this survey, the species was collected in Gunung Telapak Burok. This flowering species was found to be a rare sighting in Gunung Telapak Burok. Some of the species found in Gunung Telapak Burok were found in less localities (less than five) especially *Z. longibracteatum* in Peninsular Malaysia. Thus this forest area must be preserved for its species richness especially in wild gingers.

## 1. Introduction

Gunung Telapak Burok is the highest peak (1193m) located within Berembun Forest Reserve (FR), Negeri Sembilan. It is covered with upper hill dipterocarp forest saddled with large boulders and a popular hiking spot for avid hikers. The previous update on its botanically inventory is in 2009 by a group of researchers from Forest Research Institute Malaysia (FRIM) that reported a total of 856 specimens including 122 families, 312 genera and 552 species of plants from Berembun Forest Reserve (FR) [1]. Of this record, eight genera and 22 species of family Zingiberaceae was reported found in this forest reserve. This study aims to report an update of family Zingiberaceae which was sampled in Gunung Telapak Burok during *Ekspedisi Saintifik Kepelbagaian Biologi Hutan*, 30<sup>th</sup> March till 2<sup>nd</sup> April 2019.

Family Zingiberaceae has about 51 genera and 1600 species found in abundance in the tropical regions of Asia, Africa and the Americas [2]. To this date, the Malesian floristic region which includes Malaysia, Indonesia, Brunei, Singapore, the Philippines and Papua New Guinea has the richest diversity of the Zingiberaceae among the rest of the world [3].

The members of Zingiberaceae are perennial, aromatic herbs that forms part of the undergrowth flora for the tropical and sub-tropical forests [4]. The plant can live in a shady and damp areas. These perennial plant can be found commonly in both primary and secondary forests, to be specific at the



wet and shady areas [5]. Most gingers will grow vastly in the tropical rainforests that have loose clay structure, high moisture and also areas that have shady parts [6]. Commonly, these plants will grow at the lowland areas around 0-500 metre above the sea level. Apart from that, there are also some species that grows at the familiar places such as along the roads, open spaces, hills and also along the river stress [6]. Nevertheless, there are some species from the Zingiberaceae that can adapt and survive in higher elevations with high tolerance towards the direct sunlight [7].

Identification of Zingiberaceae is through the flowering parts that mostly grows on the forest floor or on stems that rises from the ground among the species habitat. This is indicated by the colour and also the number of stamens as the primary indicator. The species have a sympodial rhizomes, which is an underground stem that may be short or long, may be above ground or subterranean. They may grow up to eight metres in height, with a shorter real stem and longer pseudo stem that is formed by the leaf sheaths. The base is covered by several leaf sheaths without properly developed blades on the leafy shoot base. The leaf blade may present in an asymmetrical or symmetric shape [3].

The Zingiberaceae flower resembles like an orchid due to its labellum, which is fused stamens that joined together with a pair of petal-like sterile stamens. Its flowers only bloom for a few periods and usually have distinct bright and eye catching colours [7].

## 2. Materials and Methods

The sampling was conducted at Gunung Telapak Burok, Berembun Forest Reserve (FR), Negeri Sembilan (2°49' 52.7" N; 102°02' 22.2" E) from 29th March – 4th April 2019. The sampling area was divided into three trails which was covered during the five days of the expedition that covered the altitude of 700-1100 m. The sampling was done along the natural trails by random sampling. The fertile samples with seeds and inflorescence were brought back for live specimen collection in Universiti Malaysia Kelantan Jeli Campus nursery. The specimens were photographed and labelled accordingly. The identification for the wild gingers was done based on the [8][3][9][10][11][12]. Samples were then preserved as herbaria specimens and deposited to the Museum of Natural Resources, Faculty of Earth Science, Universiti Malaysia Kelantan Jeli Campus.

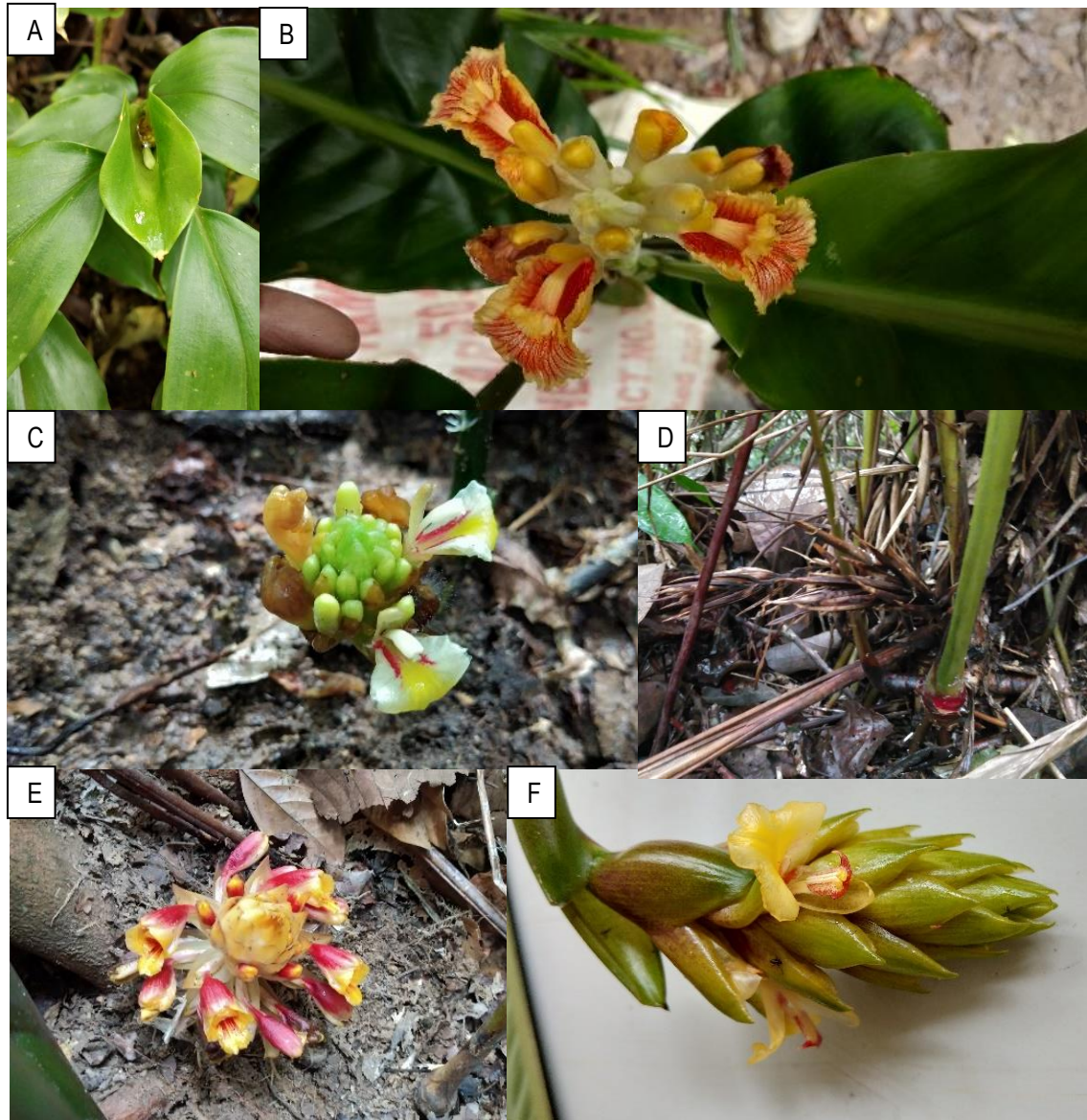
## 3. Results and Discussion

A total of 10 genera and 14 species family Zingiberaceae were recorded during the sampling. Only fertile plants with flowers and/or fruits were collected to enable identification. The list of wild ginger species and new records based on published data were tabulated in Table 1. Four species namely *Meistera ochrea* (syn. *Amomum ochreum*), *Camptandra ovata*, *Zingiber longibracteatum* and *Conamomum utriculosum* (syn. *Amomum utriculosum*) (Figure 1) were not listed during previous botanical survey [1] and were additional new records for Berembun Forest Reserve and Negeri Sembilan. The previous record also found *Haniffia cyanescens* var. *cyanescens* which is a hyper-endemic wild ginger in Bukit Tangga and in this survey, the species was collected in Gunung Telapak Burok. This flowering species was found to be a rare sighting in Gunung Telapak Burok. *Z. longibracteatum* previously was reported to be sighted in Taman Negeri Perlis, Perlis and Thailand [13]. No other reports on this species sightings were reported thus far. The finding of this species in Gunung Telapak Burok indicates this forest reserve must be continued to be protected and studied for its flora diversity. There were only two plants of this species located during this expedition, both past flowering.

**Table 1.** The list of genus and species of flowering Zingiberaceae found in Gunung Telapak Burok, Berembun Forest Reserve (FR), Negeri Sembilan. There are four new records for the forest reserve and state.

No.	Genus	Species	No of Species	New Record
1	<i>Alpinia</i>	<i>Alpinia rafflesiana</i> Wall. ex Baker	3	
		<i>Alpinia javanica</i>		
		<i>Alpinia vitellina</i> (Lindl.) Ridl.		
2	<i>Zingiber</i>	<i>Zingiber longibracteatum</i> Theilade	1	Yes, FR and Negeri Sembilan
3	<i>Camptandra</i>	<i>Camptandra ovata</i> Ridl.	1	Yes, FR and Negeri Sembilan
4	<i>Globba</i>	<i>Globba pendula</i> Roxb.	2	
		<i>Globba patens</i> Miq.		
5	<i>Etingera</i>	<i>Etingera punicea</i> (Roxb.) R. M. Smith	2	
		<i>Etingera metriocheilos</i> (Griff.) R.M.Sm.		
6	<i>Conamomum</i>	<i>Conamomum utriculosum</i> Ridl. = <i>Amomum utriculosum</i> (Ridl.) Holtum	1	Yes, FR and Negeri Sembilan
7	<i>Sundamomum</i>	<i>Sundamomum hastilabium</i> A.D. Poulsen & M.F. Newman	1	
8	<i>Meistera</i>	<i>Meistera ochrea</i> (Ridl.) Skornick & M.F. Newman = <i>Amomum ochreum</i> Ridl.	1	Yes, FR and Negeri Sembilan
9	<i>Wurfbainia</i>	<i>Wurfbainia uliginosa</i> (J.Koenig) Giseke = <i>Amomum uliginosum</i> Koenig	1	
10	<i>Haniffia</i>	<i>Haniffia cyanescens</i> var. <i>cyanescens</i>	1	
Total species			14	

Some of the Zingiberaceae found in Gunung Telapak Burok were found in fewer localities (less than five). *H. cyanescens* were previously collected in 1903 in Negeri Sembilan and described [14]. It is known to be found at Bukit Tangga hill slopes and ridges [15]. There were only three species has been named thus far and few localities from which it were known hence rendering to the rarity of finding this species flowering in Gunung Telapak Burok. The flower almost was not visible, hidden beneath the litter and the plant looked similar to smaller *Zingiber* species. The rhizome is in unique purple color contrast to the usual brown colored rhizome which is common among wild gingers. Conservation activities are often seen as the stepping stone for future downstream studies such as evaluation of potential antimicrobial extracts from wild and understudied plants, documentation of traditional knowledge and medicinal property investigation [16][17][18][19][20][21][22].



**Figure 1.** Some of the Zingiberaceae species found in Gunung Telapak Burok, Gunung Berembun Forest Reserve, Negeri Sembilan. A: *Camptandra ovata*, B: *Alpinia vitellina*, C: *Wurfbainia uliginosa*, D: *Zingiber longibracteatum*, E: *Meistera ochrea*, F: *Conamomum utriculosum* (Authors' pictures)

#### 4. Conclusion

Some of the species found in Gunung Telapak Burok were found in less localities (less than five) in Peninsular Malaysia and thus this forest area must be preserved for its species diversity especially in wild gingers. More studies needed to cover various parts of Gunung Telapak Burok in future.



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