

# Final report

## Collecting trip to Palawan (Philippines) and visit to the Forest Research Institute Malaysia

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## Introduction and objectives

Palawan is located in the western part of the Philippine archipelago. Unlike the rest of the country's islands, it lies on the Sunda shelf, making it a biological land bridge between continental Southeast Asia and the Philippines. Besides floristic elements of both regions, Palawan is also thought to host many endemic species. In fact, great part its flora is still poorly known. This is partly because not many collectors have ventured into the island and partly because the old national herbarium was destroyed during WWII and many old collections, including type specimens, went lost.

For all these reasons Palawan was the ideal locality for an expedition to the central part of the vast Malesian region.

The aim of this expedition was to collect plant specimens, focusing on my research group, Gesneriaceae, and the other main taxa studied at the Royal Botanic Garden Edinburgh: *Begonia* (Begoniaceae), Sapotaceae and Zingiberaceae. I was accompanied by Dr Mark Hughes (RBGE), our counterpart Prof Rosario Rubite (University of Manila), Mr Danilo Tandang (Philippine National Museum) and local guides. We explored the Puerto Princesa Subterranean River National Park World Heritage Site (PPSRNP) and the surrounding limestone mountains, before moving to El Nido, in the North, for a very short visit.

After fieldwork Dr Hughes and I visited the herbaria PNH (Philippine National Herbarium, Manila) and KEP (Forest Research Institute of Malaysia, Kuala Lumpur).

## The Gesneriaceae of Palawan

The Gesneriaceae are a rather large family with an estimated 3500 species in 140-150 genera, distributed mostly in the tropics and subtropics, but with some excursions into the temperate areas of both hemispheres. In Palawan only 17 species in 4 genera (*Aechynanthus*, *Agalmyla*, *Cyrtandra* and *Henckelia*) are officially reported in literature, although this is certainly an underestimation due to the low collection density over much of the island. The main collection target within this family was the genus *Paraboea* of which no species are officially recorded from Palawan. The presence of *Paraboea* in Palawan was expected on account of the proximity and the affinity with the limestones of Sabah and Sarawak and was recently confirmed by a photo sent to our research group by a local botanist, Ulysses Ferrera, looking for plant identification.

## Visa and permits

Applications for permits were submitted in January. Prof Rubite dealt with all aspects of the application and the processing and we were granted access to the PPSRNP in May. No visa was needed to enter the Philippines.

## Localities

We were based in Sabang, a small village approximately 1 hour drive from the capital city of Puerto Princesa. On our day trips we covered most of the National Park and its immediate surroundings. We gave priority to limestone areas (photo 1) but also explored Mt Bloomsfield, the ultramafic formation on the West side of Sabang, and the sandy vegetation by the coast, along the main trail. More details in the collection book attached. During the short trip to El Nido we hired a boat to explore the beautiful limestone formations off the coast (photo 2).



*Photo 1: Limestone formations in Sabang.*



*Photo 2: limestone island in El Nido.*

## **Collections**

All collections made during this expedition consist of herbarium specimens and leaf samples in silica gel. Herbarium specimens were collected in sets of 3 duplicates, occasionally more. The main set was deposited at PNH (Philippine National Herbarium, Manila), while E (RBGE herbarium) and

PPC (Palawan State University Herbarium, Puerto Princesa City) will share the duplicates. The few additional specimens will be sent to external taxonomists according to their expertise.

## Methods

Herbarium specimens were made from fertile plants (or parts of plants, according to the size), i.e. flowering and/or fruiting individuals. This allows the plant to be fully represented and more easily identifiable. For dry samples in silica gel we selected young, healthy leaves which provide better quality DNA and less fungal contamination.

At the end of each day, plants for herbarium specimens were arranged on newspaper sheets and dried with a fan heater. When the heater was not available, plants were pressed overnight and kept in 70% alcohol from the following day, to protect them from rotting, until a drier would become available. Leaves were selected and put in silica gel, then stored in a sealed container to protect them from humidity. All collected material was labelled and recorded in the collection book, where additional information gathered in the field, such as plant description, habitat, locality and GPS coordinates, were added.

Specimens were retained by the Puerto Princesa authorities for inspection and later sent to Prof Rubite in Manila, where they were dried and sorted so that PNH would retain a set of collections. Duplicates have just been given export permits and will arrive in Edinburgh soon (information updated on September 25, 2012). Here they will be identified and mounted on herbarium sheets.

## Outputs

A total of 108 herbarium specimens were collected (Appendix 1), mainly with a minimum of 3 duplicates and with associated leaf material suitable for DNA extraction.

Within the Gesneriaceae, *Cyrtandra* was the most common genus, but we have also collected at least one species of *Epithema* and we have seen *Paraboea treubii* in El Nido. Both represent new records for Palawan. As we were not covered by the permit in El Nido, no collections from the wild were made there.

The trips to the herbaria (PNH and KEP) after field work were very productive, too. In PNH I had the chance to look at plants completely new to me. One small *Paraboea* collected by a local botanist in Mindanao was found to be a new species and its formal description is almost ready for submission to a peer reviewed journal. Collaborators in KEP allowed me to collect 3 samples of Gesneriaceae from their living collection. Among these, *Paraboea bakerii* is a species likely to become extinct from the wild soon, being only found on a mountain which was recently given to a quarrying company.

## Conclusions

This year's expedition to Palawan and the following visits to the herbaria in Manila and Kuala Lumpur resulted in a great amount of useful material for my own and other people's research. Collections made in the field cover many plant families and some of them are new records for Palawan. A new species of *Paraboea* from the Philippines was seen in the herbarium in Manila and few samples for my research were taken from the living collection of the Forest Research Institute of Malaysia. New connections were created with Philippine botanists; this will facilitate collaborative studies of the Philippine plants and future expeditions.

## Final budget

International flight £900

Internal flights (incl. counterparts\*) £100

Accommodation (incl. counterparts\*) £800

Food (incl. counterparts\*) £180

Equipment and medical supplies £30

Car hire\* £150  
Local guides\* £120  
Miscellaneous expenses £50  
Postage\* £100  
Total £2430

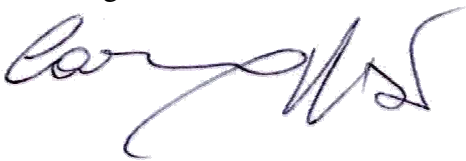
\* Counterparts and car costs were equally shared with Mark Hughes. The amounts reported are the 50% of the total spent.

Funding available:  
Davis Expedition Fund £2100  
Personal contribution £330

## **Acknowledgements**

This expedition was funded by Davis Expedition Fund. I'm most grateful to Mark Hughes and Rosario Rubite, who took care of the bureaucracy and logistics. Danilo Tandang was invaluable help in the field and in the herbarium. Ruth Kiew, Lim Chung Lu and Yao Tze Leong helped making the most of our short time in Kuala Lumpur.

Edinburgh, 10/09/2012

A handwritten signature in black ink, appearing to be 'C. J. ...', written in a cursive style.



## Appendix 1: collection book

COLL NO.	COLLECTORS	DATE	LOCALITY	FAMILY	GENUS	SPECIES
CP300	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Zingiberaceae	Globba	sp.
CP301	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Begoniaceae	Begonia	sp.
CP302	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Gesneriaceae	Cyrtandra	sp.
CP303	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Rubiaceae	Psychotria	sp.
CP304	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Gesneriaceae	Epithema	madulidii
CP305	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Begoniaceae	Begonia	sp.
CP306	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Unknown	Unknown	sp.
CP307	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Taccaceae	Tacca	sp.
CP308	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Costaceae	Costus	sp.
CP309	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Sterculiaceae	Heritiera	sp.
CP310	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Moraceae	Ficus	sp.
CP311	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Vitaceae	Cissus	sp.
CP312	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Acanthaceae	Unknown	sp.
CP313	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Rubiaceae	Ixora	sp.
CP314	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Asclepiadaceae	Unknown	sp.
CP315	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Unknown	Unknown	sp.
CP316	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Annonaceae	Goniothalamus	sp.
CP317	M. Hughes, C. Puglisi, D. Tandang, Julius	29/05/12	Sabang, jungle trail	Annonaceae	Unknown	sp.
CP318	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Unknown	Unknown	sp.
CP319	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Memecylaceae	Memecylon	paniculatum
CP320	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Rubiaceae	Unknown	sp.
CP321	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Rubiaceae	Lasianthus	sp.
CP322	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Rubiaceae	Unknown	sp.
CP323	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Annonaceae	Unknown	sp.
CP324	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Begoniaceae	Begonia	sp.
CP325	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Myristicaceae	Unknown	sp.
CP326	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Beach trail to CPS	Fabaceae	Unknown	sp.
CP327	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Rubiaceae	Unknown	sp.
CP328	M. Hughes, C. Puglisi, R. Rubite, Teddy	30/05/12	Underground river inflow	Gesneriaceae	Cyrtandra	sp.
CP329	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Underground river inflow	Araceae	Amorphophallus	sp.
CP330	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Begoniaceae	Begonia	sp.
CP331	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Rubiaceae	Mussaenda	sp.
CP332	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Goodeniaceae	Unknown	sp.
CP333	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Rubiaceae	Unknown	sp.
CP334	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Polygalaceae	Unknown	sp.
CP335	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Sapotaceae	Palaquium	sp.
CP336	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Rutaceae	Unknown	sp.

CP337	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Combretaceae	Terminalia	sp.
CP338	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Myrsinaceae	Unknown	sp.
CP339	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Myrtaceae	Syzygium	sp.
CP340	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Polygalaceae	Polygala	sp.
CP341	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Rutaceae	Xanthoxylum	sp.
CP342	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Memecylaceae	Memecylon	sp.
CP343	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Acanthaceae	Hemigraphis	sp.
CP344	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Acanthaceae	Hemigraphis	sp.
CP345	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Unknown	Unknown	sp.
CP346	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Pittosporaceae	Pittosporum	sp.
CP347	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Rubiaceae	Unknown	sp.
CP348	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Unknown	Unknown	sp.
CP349	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Rubiaceae	Psychotria	sp.
CP350	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Bignoniaceae	Radermachera	sp.
CP351	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Dilleniaceae	Dillenia	sp.
CP352	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Nepenthaceae	Nepenthes	sp.
CP353	M. Hughes, C. Puglisi, D. Tandang, Teddy	31/05/12	Mt. Bloomsfield	Araceae	Alocasia	sp.
CP354	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Illiciaceae	Unknown	sp.
CP355	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Unknown	Unknown	sp.
CP356	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Unknown	Unknown	sp.
CP357	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Annonaceae	Unknown	sp.
CP358	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Fabaceae	Bauhinia	sp.
CP359	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Annonaceae	Unknown	sp.
CP360	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Unknown	Unknown	sp.
CP361	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Zingiberaceae	Etlingera	sp.
CP362	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Convolvulaceae	Unknown	sp.
CP363	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Rubiaceae	Ixora	sp.
CP364	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Acanthaceae	Unknown	sp.
CP365	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Araceae	Amorphophallus	sp.
CP366	M. Hughes, C. Puglisi, R. Rubite, Teddy	01/06/12	The corridor	Cyperaceae	Unknown	sp.
MH1700	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Commelinaceae	Commelina	sp.
MH1701	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Zingiberaceae	Etlingera	sp.
MH1702	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Begoniaceae	Begonia	sp.
MH1703	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Apocynaceae	Wrightia	sp.
MH1704	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Begoniaceae	Begonia	sp.
MH1705	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Euphorbiaceae	Antidesma	sp.
MH1706	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Unknown	Unknown	sp.
MH1707	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Rubiaceae	Ixora	sp.
MH1708	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Araceae	Alocasia	sp.
MH1709	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Scrophulariaceae	Unknown	sp.



MH1710	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Orchidaceae	Unknown	sp.
MH1711	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Orchidaceae	Unknown	sp.
MH1712	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Annonaceae	Unknown	sp.
MH1713	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Begoniaceae	Bauhinia	sp.
MH1714	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Gesneriaceae	Epithema	sp.
MH1715	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Orchidaceae	Unknown	sp.
MH1716	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Urticaceae	Pilea	sp.
MH1717	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Gesneriaceae	Epithema	sp.
MH1718	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Apocynaceae	Voacanga	sp.
MH1719	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Araceae	Amorphophallus	sp.
MH1720	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Araceae	Arisaema	sp.
MH1721	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Balsaminaceae	Impatiens	sp.
MH1722	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Euphorbiaceae	Unknown	sp.
MH1723	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Rutaceae	Unknown	sp.
MH1724	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Balsaminaceae	Impatiens	sp.
MH1725	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Rubiaceae	Psychotria	sp.
MH1726	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Begoniaceae	Begonia	sp.
MH1727	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Piperaceae	Piper	sp.
MH1728	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Meliaceae	Aglaia	sp.
MH1729	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Memecylaceae	Memecylon	sp.
MH1730	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Annonaceae	Unknown	sp.
MH1731	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Myrsinaceae	Unknown	sp.
MH1732	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Begoniaceae	Begonia	sp.
MH1733	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Unknown	Unknown	sp.
MH1734	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Leeaceae	Leea	sp.
MH1735	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Meliaceae	Aglaia	sp.
MH1736	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Vitaceae	Tetrastigma	sp.
MH1737	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Acanthaceae	Unknown	sp.
MH1738	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Celastraceae	Unknown	sp.
MH1739	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Cycadaceae	Cycas	sp.
MH1740	M. Hughes, D. Tandang, Teddy	03-05/06/2012	Mt. St. Paul	Theaceae	Unknown	sp.