

# Kapisen

Plant Conservation Action group



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Issue 15

Newsletter



Our life depends on plants



## Nou Lavi i Depan lo Laplant

We get out of bed in the morning, hopefully eat breakfast, go to work or school, live our lives, return to bed, sleep..... Most of us are lucky enough to earn money that will buy us food and clothes and rarely think about where these things originally come from. Perhaps if we grow our own vegetables or fruits, we appreciate these food sources as we harvest the products. But reflect a little - how many plants have you used today? Perhaps your 5 daily portions of fruits/vegetables? Maybe rice, bread, cornflakes, peanuts? What are you wearing? Is it made from plant material? Do you use water, soap or toothpaste? Wait a minute... those do not come from plants.... or do they...? Do you use electricity, gas for cooking, take a bus or drive a car? Where does fossil fuel come from? (the name alone gives you a clue as to how plants might be involved!). So, if you think about it.... perhaps plants really are more important than we assumed. Perhaps we need reminding that we humans are just one part of the many complex and interlinked networks and processes that together form our Earth, our one small planet.

The theme for this issue of Kapisen comes from the title of the exhibition which has formed a major part of our joint Herbarium Project with the Natural History Museum in Seychelles (see Kapisen 13): "Our Lives Depend on Plants / 'Nou Lavi i Depan lo Laplant'". This exhibition was developed to create more awareness amongst Seychellois and visitors about the importance of plants in our lives. Kapisen 15's pages therefore mainly reflect information that was displayed either as posters (p. 6-9, 12-14) or as interactive exhibits (p. 4-5), and so brings portions of the exhibition to a wider audience. Some topics have been discussed in more detail in other issues of Kapisen, so we have added issue numbers and pages for reference.

In these pages you enter the world of plants through our daily life (p. 3), through learning about our forests (p. 6-7) and our native plants (p. 8-9). You also learn how threatened some of our endemic species are (p. 12) and discover how explorations for the Herbarium Project have enabled a measure also for rarity (p. 10-11). But much can be done to help plants, whether through your own activities (p.14) or by others, and

we present an interesting new conservation project by local farmers (p. 15) and some new research into our iconic Coco de Mer palm (p. 17). As usual we include an activity page (p. 16, adapted from the exhibition), PCA News (p.18) and Notes from the Field (p. 20). We also value feedback from our readers and are especially grateful for some recent supportive comments (p. 22). Thank you! As we have not included a literature update since Issue 12 (Sept. 2011), we have created a separate Annex (p 24-26).

Please feel free to share this issue with friends and colleagues or send them the website links. Thank you and enjoy reading Kapisen.

Editorial Team: Katy Beaver, Eva Schumacher and Christoph Kueffer

Cover photo: Elke Talma

All photos not credited: contributed by PCA

The digital pdf version of Kapisen can be downloaded:  
[www.pcaseychelles.org/kapisen.html](http://www.pcaseychelles.org/kapisen.html)  
[www.plantecology.ethz.ch/publications/books/kapisen](http://www.plantecology.ethz.ch/publications/books/kapisen)

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### Content

Our use of plants	3
Interactive exhibits	4
Our forests	6
Discovering our plants	8
Rarest plants	10
Our green insurance	12
Farmer's project	15
Activity page	16
Coco de Mer research	17
PCA News	18
Notes from the field	20
Readers' comments	22
About PCA	23
New Literature (Annex)	24

# Our Use of Plants

## A day in our life

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How important are plants in our everyday lives - for things that we need and use every day?

Of course there are food plants such as fresh fruits and vegetables and basic carbohydrate foods that we cook, such as rice, bread and cassava. But we often forget how much processing many plants require after harvesting and before we can cook them – e.g. white rice must first be milled to remove the outer husk, wheat must be ground into flour before it can be turned into bread or macaroni. And the food we buy in cans, jars and bottles all has to be processed in some way before we can eat it. And of course if you eat fish or meat (or even eggs, milk and cheese), remember that many animals require plants as food.

But are food plants the only plants we use every day? What about our clothes and shoes, our bed linen and curtains, our furniture, tools, bags, books and pencils? Even if they are not made directly from plants (e.g. clothes from cotton), there is often a close link, for example shoe leather is made from the skins of animals which ultimately depend on plants for food.

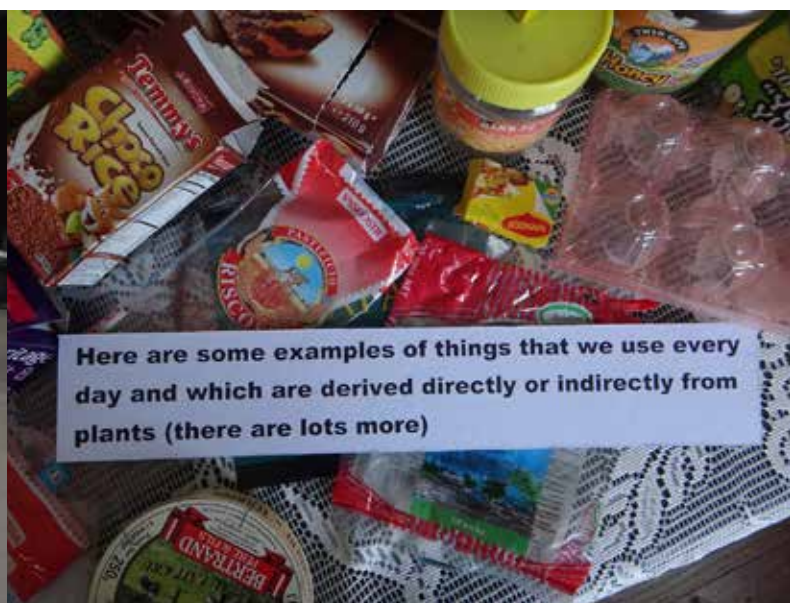
How do you keep your body, hair and teeth clean? Most probably using scented soap, shampoo and

toothpaste - all contain extracts from plants, as does the perfume you may use for a special night out. Clothes and cooking utensils and bathrooms also need to be kept clean, usually with detergents containing plant extracts and kept in plastic bottles. Although some plastics are now made from processed plant material, most are synthesized from petrochemicals derived from oil or coal. Extracted from under the ground, both coal and petroleum were once living plants that subsequently died and were fossilized and buried under layers of rock. This is also the origin of synthetic fibres used for fabrics.

Where does most of the energy come from to transport us to school and work, to light our homes and power our TVs and mobile phones, and bring the goods we need to import from overseas? Even glass jars, bottles, metal cans and china crockery require energy to extract the required substances from the ground and turn them into the containers we need. Hopefully you can work out the answer to this energy question!

And this is without mentioning the fact that plants provide us with oxygen, shade, act as carbon storage, help in providing us with a freshwater supply, perform many other vital roles in the environment (see page 7) as well as giving us joy in our gardens and beautiful scenery to admire and explore.

In other words, **OUR LIVES DEPEND ON PLANTS – NOU LAVI I DEPAN LO LAPLANT!**



From getting out of bed in the morning to going back to bed at night – some of the things we use every day.



# Interactive Exhibits

## Fun for all!

Learning can be much more enjoyable when there are things to do rather than just things to read! The most popular interactive exhibits were “Do you trust your nose?” and “Do you trust your fingers”, where children and adults alike enjoyed guessing what spices were in the small pots, and what fruits and seeds, etc were hidden in the box. (Photos for PCA by Katy Beaver and Elke Talma)





# Interactive Exhibits





# Our Forests

## History of forests in Seychelles granitic islands

### OUR FOREST HAS CHANGED

Humans often exploit their environment before they realize how their activities impact plant and animals species. Only slowly do they understand the effects of these changes on their own lives. Take a look at our own history as an example:

#### Before settlement

**1756** "The coast, on the east side, is in many places bordered by thick mangrove growth ..... In all parts of the island I visited, I found very fine and very straight trees of full maturity." (*Captain Morphey*)



#### After settlement

**1788** "[Near the port] the soil is mediocre in quality and is already suffering from erosion after destruction of the forests, nor are steps being taken to preserve it" (*Jean-Baptiste de Malavois*)



**1877/1878** "The soil ... has been much washed away since the principal woods were cut down ... Large trees are only to be found in the more inaccessible parts of the mountains" (*J G Baker*) Cinnamon covered the hills. "All the best (lower) land had been planted to coconuts" (*AWT Webb in "The story of Seychelles"*)



**1910s-1940s** Cinnamon was exploited for its oil. This required enormous amounts of firewood to supply the distilleries that processed the cinnamon leaves. The slopes became bare once more. Something had to be done!



### Fortunately humans are also very good at solving problems and fixing things!

**1950s-1960s** Timber trees such as Mahogany were planted. Fast-growing species, such as Albizia and Santol helped to prevent further soil erosion. People did not realise at the time that some of these tree species would become invasive.



**1970s-2010** Some land was protected as National Parks and as small conservation islands. Almost 50% of Seychelles land area now has protected status. BUT less than 10% of the original forest remains and most of this is invaded by alien plant species. Vegetation restoration has begun!

Photos: Plant Conservation Action group. Postcards reproduced courtesy of National Archives



For more information on Seychelles forests, read the main articles in Kapisen 12.



## How forests help us

### HIDDEN BENEFITS

Forest is not just up in the hills! There is also coastal, lowland and mangrove forest, even if only remaining in small patches or on small islands. And in the mountains there are different kinds - from mist forest and upland swamp forest to ravine forest and palm forest.

#### WHY IS IT IMPORTANT TO PROTECT FOREST ?

##### Mountain forests and our water supply



Tiny leaves of mosses and ferns capture the water held in clouds. The water drips to the ground and is absorbed into the leafy soil beneath.

The forest acts as a sponge. Rainfall is absorbed and slowly released into the rivers which supply us with most of our water.

Trees on either side of a river protect the soil banks. There is little erosion, even when the water is rushing past.

#### WHAT DOES FOREST GIVE YOU ?

- \* Timber, thatch and charcoal
- \* Nature walks
- \* Water
- \* Shade and coolness
- \* Exercise
- \* Stunning views
- \* Unique native wildlife
- \* Fruits
- \* Medicines
- \* Oxygen
- \* Removes carbon dioxide
- \* Craft materials
- \* Eco-tourism attraction
- \* Honey

##### Glorious glaci habitat



Glaci vegetation may seem more like bushes than forest, but it grows in difficult conditions. Little soil, exposure to sun and wind require special adaptations. Native species thrive. It is precious habitat.



**Nature has a right to exist for its own sake, not just for us**

##### The role of mangrove forest



Mangrove roots trap mud and debris brought down by rivers or washed up with the tide. Mangroves protect our coastline. Mangrove is an important habitat for baby fish (including edible species) and other specialized wildlife.



Photos: Plant Conservation Action group, Hicham Elzein, Elke Talma



For more information on Seychelles forests, read the main articles in Kapisen 12.



## Discovering more about our plants

### GREEN ADAPTATIONS

Plants are amazing! They have the most wonderful adaptations for survival in all kinds of environments, from exposed sunny glacis to damp dark cloud forest, and from salty mangrove to the edges of roadsides. Here are some examples:

#### Roots for stability



The buttress roots of Bodanmyen keep the tree firm in loose sandy soil.



The stilt roots of Latannyen lat and Vakwa parasol keep the trees firm at river edges and on steep slopes.



#### Roots for breathing



Mangrove trees have built-in snorkels! The soil is so muddy and water-logged that there is not enough air in it. So the pencil-like breathing roots of Mangliye blan and the knee-like roots of Mangliye lat allow these mangrove trees to breathe when the tide is low.

#### Leaves for exposed conditions



Leaves of Takamaka, Bwa ponm and Bwa kalou. Thick leathery leaves have a protective waxy layer that reduces evaporation of water. The glossy surface reflects excess heat and light.

#### Leaves for damp dark places



Belzamin sovaz  
Thin, soft, dark green leaves that easily dry out.



Mosses and Filmy ferns with tiny leaves, very thin and lacey.

#### Leaves with 'extras'



Personal water-collection system! Young leaf of Bwa rouz



How to climb higher to get more light!  
Leaf tendrils of Zolivav and Lalyann potao



Super insect food catcher! - a leaf extended into a pitcher, which contains a digestive liquid and has a very slippery surface.



Leaves with a defense system! Vakwa and Koko maron

Photos: Plant Conservation Action group



For more information about our native plants, try looking at the PCA website: [www.pcseychelles.org](http://www.pcseychelles.org)



## Discovering more about our plants

### FORGOTTEN PLANTS

We sometimes forget that seaweeds and sea grasses are really plants. Mosses are very small plants, so we tend to overlook them. And what about those strange patterns on rocks and tree bark - are they plants too? And what about mushrooms and toadstools?



Two different brown seaweeds (algae)



A green alga



A red alga



You probably use something containing seaweed extracts every day! They are used to thicken ice-cream and in toothpaste, soft drinks, glue. They make good fertilizer too as they contain useful minerals.



**Liverworts** are probably similar to the first plants to live on land. Liverworts and **mosses** do not have a vascular system to carry water inside the plant, so they prefer damp places. In the mist forest they even grow on tree leaves as well as on bark and rocks. The tiny leaves help to 'capture' water

**Sea grasses** are actually flowering plants adapted to living in salt water! Their roots hold sand in place and stop erosion.



**Lichens** are formed from a close partnership between an alga and a fungus. When growing on rocks they cause very slow chemical changes which weather the rock.



**Fungi** are vital in our world as they decompose dead wood and release the nutrients inside.

Some fungi help trees to grow, while others provide us with bread, wine, cheese and antibiotics!

Photos: Karen Chong-Seng (seaweeds)  
Plant Conservation Action group



For more information about Seychelles Forgotten Plants see Kapisen 10



## On the rarest plants of Seychelles

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### Introduction

This current issue of Kapisen is about “plants in our lives”. Therefore, as I was invited to contribute an article, I thought that it would be most appropriate to write about those plants which are most rare in our lives.

We often hear or think that the rarest plant of Seychelles (and maybe of the world) is the famous Bwa mediz (*Medusagyne oppositifolia*). This plant is indeed restricted to Seychelles (endemic) and it can be seen in a very limited number of sites. But how can we define and quantify “rarity”, and are there other species even rarer than Bwa mediz? These are actually difficult questions and regardless of definitions (e.g. Gaston & Fuller 2009; Kunin & Gaston 1997; Rabinowitz 1981), the native species of Seychelles have never been ranked for rarity. Important studies have been done, but focusing mostly on the endemics (Carlström 1996, Gerlach 1997, Huber & Ismail 2006, see also Kapisen No. 1 p.8, No. 3 p.14, No. 6 p.15).



*Piper silhouettanum*, known only from one locality in the “Pisonia forest” (= “Dans Mapou”), on Silhouette (B Senterre).



*Lastreopsis hornei* in a montane ravine close to Morne Seychellois; last seen by Horne in 1870s; rediscovered in 2011 (B Senterre).

Over the past few years, further work has been enabled through the ‘Herbarium Project’ (Kapisen 13), which has resulted in a large database of knowledge on the flora of Seychelles and on species distribution. This has been lately augmented through a major study on Seychelles Key Biodiversity Areas (KBA) in the inner granitic islands, funded by GEF, in which PCA was also a leader. These recent studies allowed us to assess with more detail the rare plants of Seychelles.

### Data collection

Among the ca. 376 native vascular plants (i.e. flowering plants and ferns) of the inner islands, a list has been compiled for the 152 rarest and/or most threatened species. For these species, all known records have been compiled in a database, including existing specimens, literature and orally transmitted sight records. In addition, extensive field explorations were set up on several islands in order to complete the dataset on species distribution. In total, 5493 records have been compiled for the selected 152 species, including 4862 records with known geographic coordinates.

### Estimation of rarity

The concept of rarity includes several aspects, such as geographic range, population size, species local abundance, ecological range, etc. Most of these data are still missing, but the recent studies introduced above provide the perfect material to assess one of the most important aspects of rarity, i.e. the area of occupancy (AOO). In order to rank species according to their rarity, we divided the Seychelles inner islands into a grid made of square cells, each one 500 x 500 m. Then, for each species, we counted the number of grid cells of occurrence (AOO).



## Results

The analyses show that ca. 70 species are actually rarer than *Bwa mediz* (known from 11 grid cells). These include 20 endemic species and 50 indigenous. Looking closer at the endemics, 4 are actually thought extinct (e.g. *Vernonia sechellensis*, *Oeceoclades sechellarum*) and 4 are still dubious taxa (e.g. *Bwa papay* varieties). Among the 12 other rarest endemics, we have *Psychotria silhouettae* and *Piper silhouettanum* both known from only one single grid cell. These species are indeed among the rarest plants in the world, and they both occur in the “Pisonia forest”, on Silhouette.

Another of the rarest endemics was recently rediscovered by us, and this is *Lastreopsis hornei*. This plant is a relatively large fern (up to 70 cm high) which had been seen only in the 1870s, by Horne. It is really a rare species, found only in the lower montane forest and especially in the tree fern belt (Senterre 2011) of Mahé and Silhouette. Each population is known from just a few individuals, clumped into deep ravines. What is also interesting about this species is that when Horne collected it, he missed the rhizome of the plant. Unfortunately, rhizome scales include the key characters to distinguish several closely related species found in Madagascar. So now that we have a rhizome specimen we can find out whether our rediscovery will confirm its endemism.



*Antrophyum callifolium* on a trunk of *Latanyen fey* at Jardin Maron (Silhouette); this is the only known individual; last seen by Horne in 1870s; rediscovered in 2012 (B Senterre):.

This example illustrates in my view that rarity at the national scale, and especially for oceanic island nations, is a more important criterion to consider than just endemism. Endemism is important of course, but it is often forgotten that there might be uncertainty on the endemism status of a given species. Several of the Seychelles “endemics” have now been discovered elsewhere (e.g. *Pisonia sechellarum* in Mayotte), or taxonomic studies have revealed that they were not significantly different from other species outside Seychelles (e.g. *Bwa sandal*, *Bwa dir ble*, *Bwa kasan-d-montanny*). Focusing only or too much on endemism is therefore very risky. In addition, quite a few indigenous species are also extremely rare (e.g. *Antrophyum callifolium* and spp., *Calanthe triplicata*, *Pseuderanthemum subviscosum*, *Viscum triflorum*, etc.) and deserve special attention in terms of conservation. For more details, see the KBA report (Senterre et al. 2013).

## Bibliography

- Carlström, A. (1996): Endemic and Threatened Plant Species on the Granitic Seychelles. Consultancy Report, Ministry of Foreign Affairs, Division of Environment, Victoria.
- Gaston, K.J. & Fuller, R.A. (2009): The sizes of species' geographic ranges. - *Journal of Applied Ecology* **46**: 1-9.
- Gerlach, J. (1997): Seychelles Red Data Book. Nature Protection Trust of Seychelles, Victoria.
- Huber, M. & Ismail, S. (2006): Suggested IUCN Red List Status of the Endemic Woody Plants of the Inner Seychelles. - Master Thesis, Eidgenössische Technische Hochschule Zürich (ETH), Institute of Integrative Biology Zurich (ibz), Zürich, 142 pp.
- Kunin, W.E. & Gaston, K.J. (1997): The Biology of Rarity: Causes and Consequences of Rare-Common Differences. Population and Community Biology Series. Vol. 17, Springer.
- Rabinowitz, D. (1981): Seven forms of rarity. - In: H. Syngé (ed.) The biological aspects of rare plant conservation. Pp. 205-218. - Wiley, New York, USA.
- Senterre, B. (2011): On the forest types of the Seychelles. - *Kapisen* **12**: 5-7.
- Senterre, B., Henriette, E., et al. (2013): Seychelles Key Biodiversity Areas. Consultancy Report, Ministry of Environment-UNDP-GEF project, Victoria, Seychelles.



## Our green insurance policy

### OUR ENDEMIC PLANTS ARE AT RISK !



There are 70 or so Seychelles flowering plant species that are found nowhere else in the world (i.e. they are endemic to Seychelles). Of these special flowering plant species, almost all are threatened to some extent:

About ONE QUARTER are Critically Endangered and could easily be lost if we are not careful.



ALMOST ONE HALF are either Endangered or Vulnerable.

The LAST QUARTER are in the categories Near Threatened or Least Concern.



This means that THREE QUARTERS of Seychelles endemic plants are in danger! We therefore have a great responsibility to protect them, to care for them, to ensure their survival, and also to try to restore their populations.



The poster shows only five examples of plant species in each of the highest risk categories. There are many more! Learn to recognize our endemic plants. You can help to protect them.

Actively helping and protecting our endemic plants is important. If we don't, they could become extinct and will then be lost FOREVER.

But we also need to look after ALL our plants, so that they will continue to support us and our future generations, for we are part of a larger ecosystem, part of planet Earth and we depend on the services which plants provide.

Actions that are helping our endemic plants include restoration and ex situ conservation (Kapisen 9), in situ conservation (Kapisen 8 & 14), upgrading the herbarium (Kapisen 13), public education and awareness (Kapisen 13 + almost all issues), and sharing scientific info (all Kapisen issues).



## Our green insurance policy

### WE CREATE THE THREATS !

In the past we humans had a huge impact on our island habitats. Deforestation, fire, the use of land for agriculture, housing, business and transport, all caused loss and alteration of habitat for our native plants. But what about now? What threats face our native plants today?

#### Fragmentation



Small plants, or plants with small populations, are separated by stretches of sea, or by houses and other developments. Genetic diversity is lost and the species becomes more vulnerable to other threats.

#### Lost partnerships



Some plants have close animal partners. They rely on each other for their survival. If one species is lost, the other may be lost too.

#### Invasive alien species



Introduced garden plants may be pretty, but if they escape into natural areas they compete with native plants for water, sunlight and nutrients.

#### Socio-economic development



This is less of a problem than before. But native vegetation is still being destroyed when some areas are developed.

#### New pests and diseases



Disease has already affected several forest tree species. New pests and diseases can arrive. We do not know how they will affect native plants. E.g. Melon fruit fly is a relatively new pest in Seychelles. Could it affect the unique Aride 'Kalbas maron'?

#### Fire



Bush fires continue to devastate native vegetation. The fires are man-made. Soil washes away, leaving hard sun-baked earth in which little can grow.

#### Climate change



Coastal vegetation is affected by storms and sand erosion. Extreme weather events are likely to increase. Sea level rise will make things worse.

#### Unsustainable harvest



Example: Rare species of medicinal plants are taken from the forest too often. The tree is damaged and dies, like this Bwa dou.



Mist forest contains many rare and specialized species. These species have nowhere to go if the cloud layer moves higher.

Photos: Plant Conservation Action group, Chris Kaiser-Bunbury, Hicham Elzein, internet (melon fly)



Threats to our native plants were the subject of Kapisen 11.



## Our green insurance policy

### HOW YOU CAN HELP

Here are some ideas for actions and activities that can help you and help our plants:



#### COMPOST

all waste plant material. Let your garden plants benefit from the nutrients.



**WALK** along a forest nature trail. Make sure you go slowly so that you observe all the plants.



**LEARN** about our native plants. Find books and/or people who know them.



#### PHOTOGRAPH

plants and take the photos to the Natural History Museum for the 'Plant Gallery'.



**JOIN** a group on a field trip into the forest. Discover more about all our plants.



**OBSERVE** the plants in your neighbourhood. Look after the useful ones.



#### USE

every piece of paper more than once. It will save trees.



**PLANT A TREE** and make sure you care for it afterwards.

**GROW** your own fruits, spices and vegetables. They are full of fresh vitamins for your body.



#### BUY LOCAL

fruits and vegetables if you cannot grow your own.



**ENJOY** the plants around you. There are so many different kinds, shapes and sizes and many have lovely colours.



**SHARE** your plant knowledge with others. E.g. how to identify or grow plants, how to use them in craft work, their medicinal properties and other uses.



**SPEAK OUT** if you think people are damaging our environment. Call the Green Line: 2722111.

### And here are a few things that we encourage you NOT to do!



- \* PLEASE do not bring into the country any plant without proper authorisation. Too many new species have been introduced which are becoming invasive and competing with our native species.
- \* PLEASE do not leave bare soil when clearing an area. Rain can quickly wash it away.
- \* PLEASE do not take any plant from the forest or a wild area. Buy from a nursery. They are not expensive.
- \* PLEASE do not damage plants or trample seedlings when you walk in the forest. Maybe they won't recover.



See also Kapisen 14, p.15.



## Saving neglected, rare and old local food crops

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We have started a project to collect and save old, neglected and rare local food crops. Many older varieties of agricultural crops are no longer cultivated, either because they have become rare or are less productive, or farmers simply prefer to buy newer high-yield varieties from overseas. Also, consumers lack awareness about these old food crops so there is little demand on the market, particularly amongst the younger generation. But if this continues, we will



Building the nursery for rare and unusual crops.

lose very important genetic diversity that could be useful to us in the future, particularly with climate change creating unpredictable conditions for small farmers. Some of these old varieties may be more able to withstand long droughts or heavy rainfall, so that they could provide us with food if the regular varieties fail.

Our project started towards the end of 2012 and has the support of the Seychelles Agricultural Agency (SAA), and we are supported by funding from the GEF Small Grants Programme. So far we have established an inventory of these crops; we have provided training for members of the Val d'Andor farmers association and their families about how to research these crops, as well as for other interested individuals in the community; and we have built a nursery in which to raise the crops and to produce further seeds for propagation. We have already collected a significant number of the crops featured in the inventory but we need to extend our efforts to further afield and collect plants from different locations.



Collecting and recording rare crop information from local residents.

We are happy that the Seychelles Agricultural Agency provided land on which we could build our nursery as our project is meant to contribute to national efforts. Although the project is a local community initiative, we hope that our work will spread beyond the Val d'Andor community. We plan to produce educational and awareness information so that many people can become interested and involved in the conservation of rare crops. They could provide us with more seeds and planting material or they may wish to grow some of these crops themselves, either on farms or in home gardens. So we will sell plants to the public at appropriate national events, such as the National Expo in June. We also want to encourage more people to consume these crops, so we may have to find new recipes for them to try. In October we shall be selling plants at a Tambola and "Manze Kreol dan leo Val dendor".



The farmers planting a variety of Patat (Sweet Potato) near the nursery

Among the crops we are collecting and growing are Indian Plum (mason), Surinam cherry (Rousay), Bilimbelle (Bilenbel), Manbolo, Grenadin, Patchouli (Patsouli), Vilakwa and Aerial Yam (Ponm edwar), as well as crop varieties such as Mayok Kafe, Patat Gro Fanm, Bannann Senzak Simiwe and Tomat Montanny.

All photos from Val D'Andor Farmers Association.



## Our native food plants

Imagine you were shipwrecked in Seychelles in 1513... 500 years ago! What would you find to eat? Perhaps fish, giant tortoises, blue pigeons or fruit bats... as long as you could catch them! But what about plants? Were there any native plants that could be used as food?

All the plants listed below are present in Seychelles **now** and can be eaten. **BUT which were present in Seychelles in 1513**, long before people settled here (1770)?

(Latin names have been included so that overseas readers can have a go at this activity too!)

Answers see page 22.



Kreson lanmar  
*Ceratopteris cornuta*



Bwa kalou  
*Memecylon eleagni*



Rousay  
*Eugenia uniflora*



Franbwaz  
*Rubus rosifolius*



Santol  
*Sandoricum koetjape*



Zak  
*Artocarpus heterophyllus*



Zanblon  
*Syzygium cumini*



Zanbroza  
*Syzygium jambos*



Vyeyfiy  
*Lantana camara*



Bigarad  
*Citrus reticulata*



Vavang  
*Vangueria madagascariensis*



Palmis  
*Deckenia nobilis*



Prin  
*Flacourtia jangomas*



Sapot  
*Pouteria campechiana*



Tanmaren  
*Tamarindus indica*



Prindefrans  
*Chrysobalanus icaco*



Bodanmyen  
Indian almond  
*Terminalia catappa*



Bwa dir  
*Pyrostria bibracteata*



Bilenbel  
*Phyllanthus acidus*

Photos:  
Prin: copyright Ken Love,  
all others: internet and  
PCA sources



## Exciting Coco de Mer research underway

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I'm a first-year PhD student from ETH Zürich (Switzerland) looking at regeneration in the endangered Seychelles endemic palm *Lodoicea maldivica* (Coco de mer) and the effects of past and present habitat degradation and fragmentation on the health of the species. Previous work has indicated that, under the current harvesting intensity of Coco de mer nuts, the proportion of juveniles and consequently the population size will gradually decline (Rist *et al.* 2010).

The three-year project involves examining the breeding system and population structure of Coco de mer, and mapping all individuals within natural-looking patches where many seedlings and young trees are clustered around a mother tree. I will work on the four remaining substantial populations of Coco de mer: Vallée de Mai, Fond Peper, Fond Ferdinand and Curieuse.

Between February and May this year, I completed my first field season in Seychelles. Among other activities I took small leaf samples for genetic analysis. The use of molecular techniques will provide answers to some questions which cannot easily be answered via other methods: Which trees are the



Emma relaxing on a beach.



Coco de Mer palm (L Chong-Seng).

mother and father of a particular juvenile? How far does pollen travel? Are there genetic differences between populations? What sex are the seedlings and juveniles? How inbred is each population?

My research is carried out in partnership with Seychelles Islands Foundation (SIF), and in collaboration with Seychelles National Parks Authority (SNPA), Praslin Development Fund (PDF) and with Global Vision International (GVI) on one aspect of the project. My supervisor in Seychelles is Chris Kaiser-Bunbury, and my supervisors in Switzerland are Chris Kettle and Peter Edwards.

With so many questions about Coco de mer remaining unanswered, partly due to the species' long life-span, hopefully I will return to Praslin next year with some interesting findings, contributing to the understanding of this iconic Seychelles palm.

### Literature

Rist L, Kaiser-Bunbury CN, Fleischer-Dogley F, *et al.* 2010. Sustainable harvesting of Coco de Mer, *Lodoicea maldivica*, in the Vallée de Mai, Seychelles. *Forest Ecology and Management* 260:2224-2231.



## PCA News

## eden project

In our 10<sup>th</sup> Anniversary Issue (November 2012), we forgot to mention an organisation, the **Eden Project** in UK, that was influential in promoting the formation of PCA and very supportive in the first years. In fact, two Eden Project staff, Tony Kendle and Juliet Rose, were present at PCA's first meeting in August 2002. At that first meeting, they emphasised the potential for international networking for plant conservation work in a small island nation, particularly with respect to the Global Strategy for Plant Conservation (GSPC). Indeed, PCA was later involved in preparing Seychelles' national response to the GSPC, which became one of the first such national initiatives worldwide (Kapisen 2 special issue). There was also close collaboration in the PhD research of Alistair Griffiths on the conservation of the critically endangered Belzamin sovaz (*Impatiens gordonii*) (Kapisen 2, p 6-7), and in 2008, Alistair returned as part of an Eden Project team that facilitated an inspirational 3-day workshop on education for sustainability (Kapisen 9, p 17).

**North Island collaboration:** The new "North Island Vegetation Management Plan 2013-2017" is the second five year plan for North Island that PCA has completed in collaboration with senior landscape and environment staff on the island. It will guide the vegetation rehabilitation programme for the next few years, again taking an ecosystem and adaptive management approach. The main focus will be consolidation of what has already been achieved, through linking smaller zones into major areas where native species are becoming dominant so that there is less fragmentation and fewer edge effects. Our partnership with North Island has recently changed so that we can be more flexible. We will continue to follow general progress in the rehabilitation programme and provide advice when requested, but any other work will be carried out through mutual agreement on a consultancy basis.

One aspect of our previous vegetation monitoring on North Island in the last few years has been the effects of the prolonged drought. Not only has there been less rain during the dry seasons but also relatively little during the wet season, so that the total annual rainfall for each of the past 3 years (2010-2012) has been considerably less than that of the previous 5 years (2005-2009). In fact for 2012 the annual rainfall was half that of the average for that 5 year period (1148 mm compared with an average 2139 mm). Consequently, in bouldery areas with relatively little soil, the rehabilitated native vegetation suffered, losing many leaves and in some cases even dying.



The same rehabilitated rocky area of North Island on 28 Aug 2010, after 1 year of drought, and 01 Sept 2012, after 3 years of drought.



## Awareness and outreach – Photo Competition Exhibition

As well as taking the main PCA plant exhibition from the capital, Victoria, out to communities in other areas of Mahé, at the end of 2012 we took the **Plant Photo Competition Exhibition** (Kapisen 14, pp 10, 11, 16) even further afield, to the island of Praslin. The display was mounted at both the community centres on Praslin, as well as at the Visitor Centre of Vallée de Mai World Heritage Site, with the assistance of Seychelles Islands Foundation (SIF).



Plant Photo Competition winning photos displayed at a community centre on Praslin (SIF).

## Awareness and outreach – Earth Day 2013

For **Earth Day 2013**, a youth event drawing attention to “The Face of Climate Change” was mounted at the University of Seychelles. PCA took part with a small display highlighting the possible effects of climate change on the biodiversity of the mist forest - if the temperature rises, the cloud layer might form above the mountain tops for increasing periods, reducing the humidity required by the flora and fauna living there. Where can they go? There is no higher ground! (Kapisen 12, p 8-9)

Another event was Biodiversity Day, focussing on water and biodiversity, and this event was held in a shopping mall, so a greater variety of people came through to view the different displays by government and non government organisations. For these kinds of events, PCA can make good use of the posters which were developed for the Herbarium Project exhibition (see photo), because they are all relevant to the importance of plants in our lives and to the plant conservation work of our organisation.



PCA displays: Earth Day (22 April): “The Face of Climate Change” (left) and Biodiversity Day (22 May): “Water and Biodiversity”.

**Collaboration with ETH Zurich:** Marine Beaud, who did the field work for her Master thesis on the functional diversity of the Seychelles flora in November/December 2010, in collaboration with PCA and under the supervision of Christoph Kueffer, won the ETH silver medal for her Master thesis. This is a prize awarded each year to the very best theses across all ETH departments. Congratulations Marine!



## Notes from the Field

### New Pest

Unfortunately we have to report yet **another new pest introduction** into Seychelles. A new species of mealy bug is attacking mainly Papaya trees, badly affecting the growth and ripening of the fruits, and eventually killing the tree. According to Seychelles Agriculture Agency, this pest is mainly in the north and east of Mahé at the moment but is highly likely to spread, so do keep a look out for it, especially on papaya, frangipani and hibiscus. But more importantly, if anyone sees this insect on a native plant species, please let us know, giving plant name, location, date and if possible a photo (our contacts are on page 23). Do not confuse this mealy bug with a more common white waxy mealy bug which has yellow markings and is already found on certain native species e.g. *Ficus lutea* (lafous granfey). The new mealy bug species is usually present in large numbers and as the insects grow larger they become covered with a mass of white threads that looks like cotton wool. When there are many insects together, this is what seems to cover whole fruits.



New mealy bug pest of Papaya - on fruits (top, right) and on underside of leaf (lower, left); lower, right - another common mealy bug (K Beaver).

### Moyenne Island

The first PCA field trip of 2013 was to **Moyenne Island**, which at just 9 hectares, is the smallest and the most recently designated (2008) of Seychelles' National Parks. The island is now managed by the Moyenne Island Foundation, a non-profit organisation set up by the previous owner, Brendon Grimshaw, who died in 2012. Brendon and his Seychellois friend Rene Lafortune, between the early 1970s and 2012, converted the scrub covered island into peaceful shady woodland, much loved by overseas visitors and locals alike. Although Brendon introduced many native plant species, particularly in later years, much of the island is covered with introduced species such as Mahogany and Kalis dipap (*Tabebuia*), which were the most abundant seedlings available from the Forestry Department in the 1970s and '80s. However there are native coastal species such as Var (*Hibiscus tiliaceus*), Vakwa bordmer (*Pandanus balfourii*), many planted Takamaka (*Calophyllum inophyllum*) and an old Mangliye pasyans (*Xylocarpus moluccensis*) tree; and Brendon planted several endemic Bwadnat (*Mimusops sechellarum*) which have grown into tall mature trees, as well as Bwa kalou (*Memecylon eleagni*), Kafe maron gran fey (*Paragenipa wrightii*) and indigenous Gayak (*Intsia bijuga*). There are also a few planted endemic palms, including Coco de mer, and until recently there was a wonderful specimen of one of the rarer Bwa bannann (*Polyscias [Gastonia] sechellarum*) but something fell on it and it gradually faded away. So, in the future PCA would like to assist with the continued addition of native species to this special little island.



## Moyenne Island - photos



Moyenne Island - Shady open woodland and spectacular eroded granite boulders with a view of the nearby islands of Ste Anne Marine National Park (B Hortence)

## Baobab

PCA member, Andre Dufrenne, who works on Ste Anne Island (not far from Mahé), notes that there is a magnificent old **Baobab tree** on the island, quite close to one of the small roads constructed during the 1980s. Baobab ('Moulapa' in Creole) is an introduced species in Seychelles and relatively rare. In fact 2 different species of Baobab have been introduced, both probably in the late 19<sup>th</sup> Century. Globally, there are 8 species of Baobab (*Adansonia*), 6 of them native to Madagascar, 1 in Africa and Arabia, and 1 in Australia. The one on Sainte Anne is *Adansonia digitata* (the African species), the same species as the well known trees on La Digue. Both have huge trunks, with all the branches concentrated near the top of the tree. The leaves are palmate and the large velvety fruits are oval. Apparently the dried pulp of the fruits is edible, as are the leaves, but Seychellois don't normally eat them. Another species, *Adansonia madagascariensis* can be found for example at La Plaine St Andre on Mahé. This species also has palmate leaves but the fruits are smaller and round.



The giant trunk of the Baobab on Ste Anne Island measures 5 metres in circumference (A Dufrenne)



Flower, fruit, adult tree and leaf of *Adansonia digitata* (drawing by K Beaver from "Nature Trails and Walks in Seychelles, No. 10 La Digue", 1990)



## Thank you to readers of our 10th Anniversary issue!

*"I really enjoy 'Kapisen' and reading it gives me a sense of joy that is rare in my hurried days."*

**Mathieu LaBuschagne**

*"Congratulations on your 10th anniversary, and thanks to the PCA for all your wonderful work. It is only through enthusiasts like you that we will make a dent in saving the world's flora, and that of the Seychelles is extremely special. I look forward to following what you are up to for the next 10 (and hopefully more) years!"*

**Wendy Strahm**

*"Very nice, comprehensive, well documented, and well presented. Congratulations."*

**Pascal Bovet**

*"Many thanks for sending the latest issue of Kapisen, which I always enjoy. It is indeed a pleasure to see the review of ten years of great achievements by the PCA. Many congratulations."*

**Peter Wyse Jackson**

*"I have been reading "Kapisen" for 5 years now. And I wish PCA a Happy 10th Anniversary and keep up the good work that you are doing. I am learning a lot from you guys and thank you for sharing your knowledge and expertise with all of us. I wish you all the best in the future as I know you have a bright one ahead of you."*

**Philomena Hollanda**

*"The Special Issue looks really good. Well done!"*

**Aline Finger**

*"I read 'Kapisen' with great interest, and this special edition was amazing. I am awestruck that you have managed to create such an active plant-conservation community in the Seychelles. There are many parts of the world that are larger and have many more resources that haven't a fraction of what you have. You should be very proud. Congratulations on 10 very productive years!"*

**Greg Plunkett**

*"Another excellent issue!"*

**Steve Blackmore**

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### Activity Page - Our Native Food Plants (answers)

Only FIVE of the edible plants shown in the photos were present on the islands before people settled:

**Bodanmyen** (you can eat the nut inside the fruit)

**Bwa dir** (edible fruits)

**Bwa kalou** (edible fruits)

**Kreson lanmar** (you can cook the leaves)

**Palmis** (the palm heart makes a salad)

All the other edible plants shown on the poster have been introduced during the past 243 years (with the possible exception of Vavang)



# About PCA

## Plant Conservation Action group – who we are and what we do

**When we started:** November 2002

**Who we are:** We are a **voluntary** membership organisation (**NGO**), with a committee elected annually. We have monthly meetings and regular field trips.

**Our main aim is to further plant conservation in Seychelles** and to work on projects that promote conservation action and awareness about plants in Seychelles, especially native plants.

### What we do:

- Plant species identifications
- Advice on vegetation restoration/rehabilitation
- Vegetation surveys and management plans
- Research and monitoring
- Conservation action for plants
- Capacity building
- Raising awareness about plants
- Field trips for members and plant enthusiasts



**Our latest major project:** The Herbarium project, which you can learn about in “Kapisen” Issue No. 13.

**Website:** <http://www.pcaseychelles.org>

**Contacts:** [pca.seychelles@gmail.com](mailto:pca.seychelles@gmail.com); Telephone +248 4241104 or +248 2574619





## ANNEX TO KAPISEN 15: New Literature relevant to Seychelles since 2011

- Ba AM, Duponnois R, Moyersoer B, Diedhiou AG (2012) Ectomycorrhizal symbiosis of tropical African trees. *Mycorrhiza* 22 (1):1-29. doi:10.1007/s00572-011-0415-x
- Baret, S., Baider, C., Kueffer, C., Foxcroft, L.C., Lagabrielle, E. (2013) Threats to paradise? Plant invasions in protected areas of the Western Indian Ocean Islands. In: Foxcroft LC, Pyšek, P, Richardson, DM, and Genovesi, P, editors. *Plant invasions in protected areas: patterns, problems and challenges*. Dordrecht: Springer, in press.
- Buerki S, Phillipson PB, Callmander MW (2011) A taxonomic revision of *Gouania* (Rhamnaceae) in Madagascar and the other islands of the Western Indian Ocean (the Comoro and Mascarene Islands, and the Seychelles). *Annals of the Missouri Botanical Garden* 98 (2):157-195. doi:10.3417/2007075
- Buerki S, Devey DS, Callmander MW, Phillipson PB, Forest F (2013) Spatio-temporal history of the endemic genera of Madagascar. *Botanical Journal of the Linnean Society* 171 (2):304-329. doi:10.1111/boj.12008
- Callmander MW, Phillipson PB, Gautier L (2011) Notes on the flora of Madagascar, 14-21. *Candollea* 66 (2):397-401
- Couteyen S, Papazian M (2012) Catalogue and geographical affinities of the Odonata of the neighboring islands of Madagascar (Insecta: Pterygota). *Annales De La Societe Entomologique De France* 48 (1-2):199-215
- Daniels SR (2011) Reconstructing the colonisation and diversification history of the endemic freshwater crab (*Seychellum alluaudi*) in the granitic and volcanic Seychelles Archipelago. *Molecular Phylogenetics and Evolution* 61 (2):534-542. doi:10.1016/j.ympev.2011.07.015
- De Bruyn A, Villemot J, Lefeuvre P, Villar E, Hoareau M, Harimalala M, Abdoul-Karime AL, Abdou-Chakour C, Reynaud B, Harkins GW, Varsani A, Martin DP, Lett J-M (2012) East African cassava mosaic-like viruses from Africa to Indian ocean islands: molecular diversity, evolutionary history and geographical dissemination of a bipartite begomovirus. *Bmc Evolutionary Biology* 12. doi:22810.1186/1471-2148-12-228
- Ellis, J. C., P. J. Bellingham, E. K. Cameron, D. A. Croll, G. S. Kolb, C. Kueffer, G. H. Mittelhauser, S. Schmidt, V. E, and D. A. Wait. (2011) Effects of Seabirds on Plant Communities. Pages 177-211 in C. P. H. Mulder, W. B. Anderson, D. R. Towns, and P. J. Bellingham, editors. *Seabird Islands: Ecology, Invasion, and Restoration*. Oxford University Press, Oxford.
- Ewel, J. J., J. Mascaro, C. Kueffer, A. E. Lugo, L. Lach, and M. R. Gardener. (2013) Islands: Where novelty is the norm. Pages 29-44 in R. J. Hobbs, E. S. Higgs, and C. M. Hall, editors. *Novel Ecosystems. Intervening in the New Ecological World Order*. Wiley-Blackwell, Oxford.
- Feare CJ, Doherty PF, Jr. (2011) Age at first breeding and pre-breeding survival in Seychelles sooty terns *Onychoprion fuscatus*. *Marine Ornithology* 39 (2):221-226
- Finger A, Kettle CJ, Kaiser-Bunbury CN, Valentin T, Doudee D, Matatiken D, Ghazoul J (2011) Back from the brink: potential for genetic rescue in a critically endangered tree. *Molecular Ecology* 20 (18):3773-3784. doi:10.1111/j.1365-294X.2011.05228.x
- Finger A, Kaiser-Bunbury CN, Kettle CJ (2012a) Development of polymorphic microsatellite markers of the Seychelles endemic tree *Glionnetia sericea* (Rubiaceae). *Conservation Genetics Resources* 4 (2):239-241. doi:10.1007/s12686-011-9515-3
- Finger A, Kettle CJ, Kaiser-Bunbury CN, Valentin T, Mougali J, Ghazoul J (2012b) Forest fragmentation genetics in a formerly widespread island endemic tree: *Vateriopsis seychellarum* (Dipterocarpaceae). *Molecular Ecology* 21 (10):2369-2382. doi:10.1111/j.1365-294X.2012.05543.x
- Fleischer-Dogley F, Kettle CJ, Edwards PJ, Ghazoul J, Maeaettaenen K, Kaiser-Bunbury CN (2011) Morphological and genetic differentiation in populations of the dispersal-limited coco de mer (*Lodoicea maldivica*): implications for management and conservation. *Diversity and Distributions* 17 (2):235-243. doi:10.1111/j.1472-4642.2010.00732.x
- Gaigher R, Samways MJ (2013) Strategic Management of an Invasive Ant-scale Mutualism Enables Recovery of a Threatened Tropical Tree Species. *Biotropica* 45 (1):128-134. doi:10.1111/j.1744-7429.2012.00898.x
- Gaigher R, Samways MJ, Henwood J, Jolliffe K (2011) Impact of a mutualism between an invasive ant and honeydew-producing insects on a functionally important tree on a tropical island. *Biological Invasions* 13 (8):1717-1721. doi:10.1007/s10530-010-9934-1
- George SE, Lowry PP, II (2011) A new name for the endemic species of *Diospyros* L. (Ebenaceae) in the Seychelles. *Candollea* 66 (2):422-423
- Gerlach J (2011a) Development of Distinct Morphotypes in Captive Seychelles-Aldabra Giant Tortoises. *Chelonian Conservation and Biology* 10 (1):102-112
- Gerlach J (2011b) The potential effects of climate change on the status of Seychelles frogs (Anura: Sooglossidae). *Journal of Threatened Taxa* 3 (11):2153-2166



- Goodman SM, Puechmaille SJ, Friedli-Weyeneth N, Gerlach J, Ruedi M, Schoeman MC, Stanley WT, Teeling EC (2012) Phylogeny of the Emballonurini (sheath-tailed bats) (Emballonuridae) with descriptions of a new genus and species from Madagascar. *Journal of Mammalogy* 93 (6):1440-1455. doi:10.1644/11-mamm-a-271.1
- Government of Seychelles (2012) Seychelles Sustainable Development Strategy 2012-2020
- Gower DJ, San Mauro D, Giri V, Bhatta G, Govindappa V, Kotharambath R, Oommen OV, Fatih FA, Mackenzie-Dodds JA, Nussbaum RA, Biju SD, Shouche YS, Wilkinson M (2011) Molecular systematics of caeciliid caecilians (Amphibia: Gymnophiona) of the Western Ghats, India. *Molecular Phylogenetics and Evolution* 59 (3):698-707. doi:10.1016/j.ympev.2011.03.002
- Gunn BF, Baudouin L, Olsen KM (2011) Independent Origins of Cultivated Coconut (*Cocos nucifera* L.) in the Old World Tropics. *Plos One* 6 (6). doi:e2114310.1371/journal.pone.0021143
- Henriette E, Rocamora G (2011) Comparative use of three methods for estimating the population size of a transferred island endemic: the endangered Seychelles White-eye *Zosterops modestus*. *Ostrich* 82 (2):87-94. doi:10.2989/00306525.2011.603462
- Henriette E, Rocamora G (2012) Survival rates of a tropical island endemic following conservation introduction on a rehabilitated island: the case of the endangered Seychelles White-eye. *Revue D Ecologie-La Terre Et La Vie* 67 (2):223-236
- Hromadka L (2011) Revision of the genus *Gabrius* STEPHENS 1829 from Madagascar and adjoining Islands (Coleoptera: Staphylinidae: Pilonothina). *Linzer Biologische Beitrage* 43 (2):1377-1397
- Hugel S (2012) New and little known Phisidini from Madagascar, Comoros and Seychelles (Orthoptera, Ensifera, Meconematinae). *Zoosystema* 34 (3):525-552. doi:10.5252/z2012n3a3
- Krishnankutty SM, Dietrich CH (2011) Review of Mileewine Leafhoppers (Hemiptera: Cicadellidae: Mileewinae) in Madagascar, With Description of Seven New Species. *Annals of the Entomological Society of America* 104 (4):636-648. doi:10.1603/an11022
- Kueffer, C. (2011) Preventing and managing plant invasions on oceanic islands. *BGjournal – Journal of Botanic Gardens Conservation International* 8:14-17.
- Kueffer, C. (2012) The importance of collaborative learning and research among conservationists from different oceanic islands. *Revue d'Ecologie (Terre et Vie) Suppl.* 11:125-135.
- Kueffer, C. (2013) Integrating natural and social sciences for understanding and managing plant invasions. Pages 71-96 in S. Larrue, editor. *Biodiversity and Society in the Pacific Islands*. Presses Universitaires de Provence. Collection "Confluent des Sciences" & ANU ePress, Marseille, France & Canberra, Australia.
- Kueffer, C., K. Beaver, and J. Mougil. (2013) Management of novel ecosystems in the Seychelles. Pages 228-238 in R. J. Hobbs, E. S. Higgs, and C. M. Hall, editors. *Novel Ecosystems. Intervening in the New Ecological World Order*. Wiley-Blackwell, Oxford.
- Lawrence JM, Samways MJ, Henwood J, Kelly J (2011) Effect of an invasive ant and its chemical control on a threatened endemic Seychelles millipede. *Ecotoxicology* 20 (4):731-738 doi:10.1007/s10646-011-0614-4
- Lawrence, James M., et al. (2013) Population dynamics of a threatened giant millipede: implications for restoration. *Invertebrate Biology*, Volume 132, Issue 1, pages 46–51
- Lawrence, James M., et al. (2013) Beyond vegetation-based habitat restoration for a threatened giant Spirostreptid millipede. *Journal of Insect Conservation* in press. doi:
- Le Goff G, Bousses P, Julienne S, Brengues C, Rahola N, Rocamora G, Robert V (2012) The mosquitoes (Diptera: Culidae) of Seychelles: taxonomy, ecology, vectorial importance, and identification keys. *Parasites & Vectors* 5. doi:20710.1186/1756-3305-5-207
- Lim, T. K. (2012) *Lodoicea maldivica*. *Edible Medicinal and Non-Medicinal Plants*. Springer Netherlands. 399-401.
- Lima A, Harris D.J., Rocha S., Miralles A, Glaw F, Vences M. (2013) Phylogenetic relationships of *Trachylepis* skink species from Madagascar and the Seychelles (Scincidae: Lygosominae). *Molecular Phylogenetics and Evolution*, in press.
- Linz, Jeanine, et al. (2013) Host plant-driven sensory specialization in *Drosophila erecta*. *Proceedings of the Royal Society B: Biological Sciences* 280.1760
- Mac Niocaill, Conall. (2013) Plate tectonics: Calling card of a ghost continent. *Nature Geoscience* 6.3: 165-166.
- Madl M, Matyot P (2012) Notes on Lucanidae of the Republic of Seychelles (Coleoptera: Scarabaeoidea). *Linzer Biologische Beitrage* 44 (2):1215-1220
- Mortimer JA, Camille J-C, Boniface N (2011a) Seasonality and Status of Nesting Hawksbill (*Eretmochelys imbricata*) and Green Turtles (*Chelonia mydas*) at D'Arros Island, Amirantes Group, Seychelles. *Chelonian Conservation and Biology* 10 (1):26-33
- Mortimer JA, von Brandis RG, Liljevik A, Chapman R, Collie J (2011b) Fall and Rise of Nesting Green Turtles (*Chelonia mydas*) at Aldabra Atoll, Seychelles: Positive Response to Four Decades of Protection (1968-2008). *Chelonian Conservation and Biology* 10 (2):165-176

- Motomura H, Bearez P, Causse R (2011) Review of Indo-Pacific specimens of the subfamily Scorpaeninae (Scorpaenidae), deposited in the Museum national d'Histoire naturelle, Paris, with description of a new species of Neomerinthe. *Cybium* 35 (1):55-73
- Mougal J, Henriette E (2012) Management of Invasive Alien Creepers: Recommended practice for the management of a selection of priority Invasive Alien Creepers, A Guidebook. Government of Seychelles-UNDP-GEF Biosecurity Project
- Noble T, Bunbury N, Kaiser-Bunbury CN, Bell DJ (2011) Ecology and co-existence of two endemic day gecko (*Phelsuma*) species in Seychelles native palm forest. *Journal of Zoology* 283 (1):73-80. doi:10.1111/j.1469-7998.2010.00751.x
- Oschadleus, H. Dieter, Riaz Aumeeruddy, and Sjouke A. Kingma. (2013): Longevity of the Seychelles Fody *Foudia sechellarum*. *Ostrich* 84.1: 89-91.
- Patel, Seema. (2012) Exotic tropical plant *Psidium cattleianum*: a review on prospects and threats. *Reviews in Environmental Science and Bio/Technology* 11.3: 243-248.
- Platnick NI, Duperre N, Ott R, Baehr BC, Kranz-Baltensperger Y (2012) The Goblin Spider Genus *Pelcinus* (Araneae, Oonopidae), Part 1. *American Museum Novitates* (3741):1-43
- Pocs T (2011) Type studies of some African Lejeuneaceae. *Acta Botanica Hungarica* 53 (1-2):181-192. doi:10.1556/ABot.53.2011.1-2.18
- Robert V, Rocamora G, Julienne S, Goodman SM (2011) Why are anopheline mosquitoes not present in the Seychelles? *Malaria Journal* 10. doi:3110.1186/1475-2875-10-31
- Rocha S, Harris DJ, Posada D (2011) Cryptic diversity within the endemic prehensile-tailed gecko *Urocytyledon inexpectata* across the Seychelles Islands: patterns of phylogeographical structure and isolation at the multilocus level. *Biological Journal of the Linnean Society* 104 (1):177-191. doi:10.1111/j.10958312.2011.01710.x
- Rocha, S., Posada, D., and Harris, D.J. (2013) Phylogeography and diversification history of the day-gecko genus *Phelsuma* in the Seychelles islands. *BMC evolutionary biology* 13.1: 3. Doi:
- Rowson B, Tattersfield P, Symondson WOC (2011) Phylogeny and biogeography of tropical carnivorous land-snails (Pulmonata: Streptaxoidea) with particular reference to East Africa and the Indian Ocean. *Zoologica Scripta* 40 (1):85-98. doi:10.1111/j.1463-6409.2010.00456.x
- Smale DA, Barnes DKA, Barnes RSK, Smith DJ, Suggett DJ (2012) Spatial variability in the structure of intertidal crab and gastropod assemblages within the Seychelles Archipelago (Indian Ocean). *Journal of Sea Research* 69:8-15. doi:10.1016/j.seares.2012.01.002
- Stroinski, Adam. (2013) A New Extraordinary Genus of Ricaniidae from the Seychelles (Hemiptera: Fulgoromorpha)." *Annales Zoologici*. Vol. 63. No. 1. Museum and Institute of Zoology, Polish Academy of Sciences
- Taylor ML, Bunbury N, Chong-Seng L, Doak N, Kundu S, Griffiths RA, Groombridge JJ (2012) Evidence for evolutionary distinctiveness of a newly discovered population of sooglossid frogs on Praslin Island, Seychelles. *Conservation Genetics* 13 (2):557-566. doi:10.1007/s10592-011-0307-9
- Taylor R (2012) Habitat Restoration Effectiveness in Restoring Plant-Seed Disperser Interactions Using Seychelles' Inselbergs as Model Systems. MSc Thesis, University of Zurich, Switzerland
- Thürlimann N (2013) Frugivory and Seed Dispersal by the Seychelles Skink (*Mabuya sechellensis*) and its Response to Habitat Restoration. MSc Thesis, University of Zurich, Switzerland
- van de Crommenacker J, Komdeur J, Burke T, Richardson DS (2011) Spatio-temporal variation in territory quality and oxidative status: a natural experiment in the Seychelles warbler (*Acrocephalus sechellensis*). *Journal of Animal Ecology* 80 (3):668-680. doi:10.1111/j.1365-2656.2010.01792.x
- von Brandis, Rainer G. (2012) Rehabilitation of abandoned coconut plantations at D'Arros Island, Republic of Seychelles. *Ocean & Coastal Management* 2012
- Waibel, Annika, et al. (2013) Does a giant tortoise taxon substitute enhance seed germination of exotic fleshy-fruited plants?. *Journal of Plant Ecology* 6.1: 57-63.
- Wurmser F, Ogereau D, Mary-Huard T, Loriod B, Joly D, Montchamp-Moreau C (2011) Population transcriptomics: insights from *Drosophila simulans*, *Drosophila sechellia* and their hybrids. *Genetica* 139 (4):465-477. doi:10.1007/s10709-011-9566-0
- Yoshimura M, Fisher BL (2011) A revision of male ants of the Malagasy region (Hymenoptera: Formicidae): Key to genera of the subfamily Dolichoderinae. *Zootaxa* (2794):1-34
- Yoshimura M, Fisher BL (2012) A Revision of Male Ants of the Malagasy Amblyoponinae (Hymenoptera: Formicidae) with Resurrections of the Genera *Stigmatomma* and *Xymmer*. *Plos One* 7 (3). doi:e33325