


# GEKKO

The Journal of the Global Gecko Association  
Volume Three, Issue Two





# Gecko Hunting in New Caledonia

High elevation humid forest featuring tree ferns on one of the many massifs in Province Nord.

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## Introduction

New Caledonia is a nation located in the southern Pacific Ocean 1,509 km east of Australia and just 1,708 km north of New Zealand. Its total landmass is approximately 18,760 km<sup>2</sup>. The geographic region known as New Caledonia includes the main island of New Caledonia (also known as the Grande Terre), the three Loyalty Islands (Ouvéa, Lifou, and Maré), the Isle of Pines and many smaller islands including the Belep Islands to the north. The Grande Terre itself is approximately 16,648 km<sup>2</sup> in size (Bauer and Sadlier, 2000). It is divided into two provinces (Province Nord and Province Sud) each of which is largely

independently governed. The islands have long geologic histories with the island of Grande Terre being essentially isolated for at least 65 million years with only periodic connections to other landmasses in the area. Such isolation has allowed evolution to take directions within New Caledonia that were not taken elsewhere. There are many endemic taxa in New Caledonia, including approximately 75% of the plant species and many of animals.

The climate of New Caledonia is locally highly variable with major rainfall differences depending upon whether the site is east or west of the central mountain chain and also depending upon elevation. Sites can get an average rainfall of less than 900 mm or more than 4000 mm. Average daily temperatures (averaging daytime and nighttime temperatures) can vary annually by several degrees with winter temperatures averaging around 19° C and summer temperatures of 27° C. Nighttime temperatures are often much cooler than day.

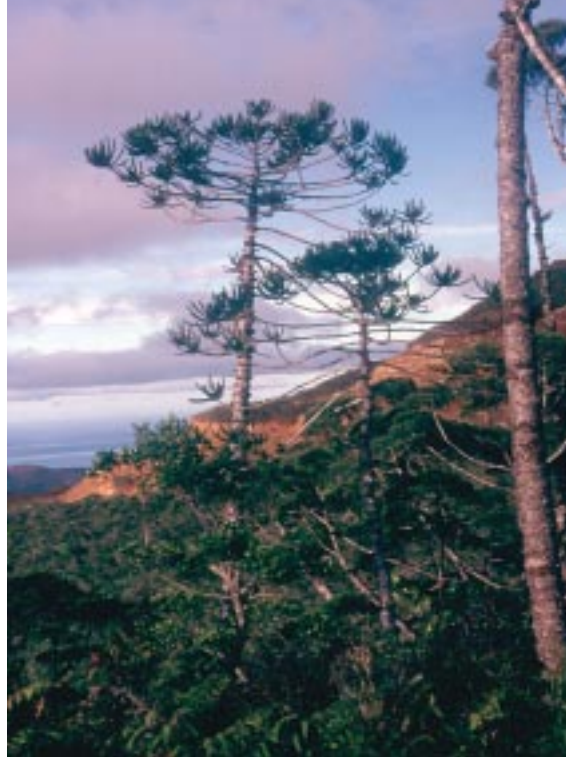
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## The Expedition

In January 2003 it was my privilege to join an expedition to the island of New Caledonia. The expedition was split into two groups, one for Province Nord and the other for Province Sud. The southern team included Dr. James D. Lazell, Dr. Wenhua Lu, Jonathan Kolby, Kerry Sherred and Elisabeth Hills. The northern team included Dr. Aaron Bauer, Ross Sadlier, Dr. Todd Jackman and Dr. Sarah Smith. I spent the majority of my time with the northern team, but also spent a week in the south.

The goals of the two teams were similar: to find and collect reptiles from areas either only recently surveyed herpetologically, or areas that had never been surveyed herpetologically. The southern team focused on small offshore islands that had never been surveyed previously, whereas the northern team visited areas of the mainland that had only recently been open to surveys. Both teams had high expectations for finding new species and extending geographic ranges of known taxa.

For my two weeks with the northern expedition we visited a dozen or so unique localities from sea level to 1,200 meters in elevation. The sites were highly varied, some being former nickel mines while others were pristine reserves. We endured heat, fire ants, windstorms, dust, toxic plants, thirst, baguettes (New Caledonia is a French colony... baguettes are cheap, but have a short shelf life. One can easily break a tooth

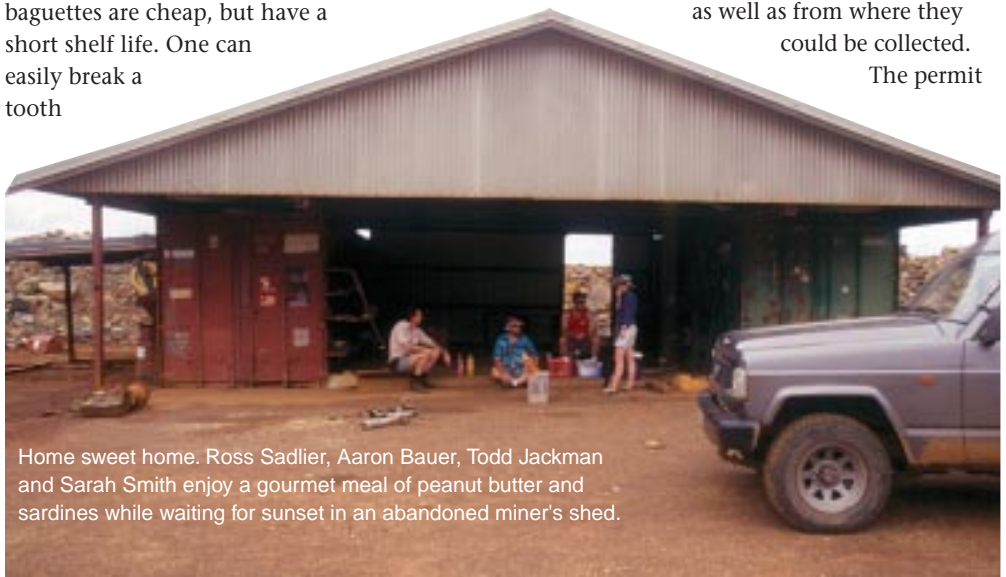


The ancient *Araucaria* trees are among the plants unique to New Caledonia.

on a day-old baguette ... but you can pound in tent stakes with them too!), giant spiders, snoring, bad smells, lack of showers, and yet we remained friends. Everyone in the group was dedicated to the cause. What hardships there were we endured together with the daily promise of new lizards to be seen.

Our scientific collecting permit for Province Nord was specific in terms of what species could be captured for ongoing research as well as from where they could be collected.

The permit



Home sweet home. Ross Sadlier, Aaron Bauer, Todd Jackman and Sarah Smith enjoy a gourmet meal of peanut butter and sardines while waiting for sunset in an abandoned miner's shed.



Typical maquis habitat where *Eurydactylodes* and *Bavayia validiclavis* could be found.

situation in New Caledonia has become more sensitive in recent years following several arrests of smugglers professing to be herpetologists conducting research. All were smuggling geckos. None was legitimate and they have done little more than raise the suspicions of the law enforcement offices for anyone venturing to New Caledonia with the true intent of studying the herpetofauna of this region. Sadly, some of the names of those arrested will be familiar to geckophiles. A word to the wise: obtain your New Caledonian endemics as captive-bred animals. Do not plan to go catch them yourself or get them cheaply from somebody who claims to have permits. New Caledonia does not issue permits to the pet trade and only under extremely important conditions (with significant scientific justification) will they issue permits to export live animals. These extreme cases tend to be zoos or researchers studying reproductive physiology. Such permits typically do not allow offspring of such

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animals to be given away or sold and all the original animals must be accounted for.

This being the case, our permit allowed us to survey some very interesting localities and collect many species of gecko and skink. We collected fewer than we saw of most species. The majority of specimens collected represent potentially new taxa whose DNA will be sequenced allowing new species to be described in the near future. It is important to note that all of the specimens we collected are now in the collections of recognized museums where they will serve to represent their species for all future researchers. This is important because many of the new taxa will need immediate protection since they live in very small areas and are likely to be too tempting to pass by for poachers. It is a point worthy of repeating. Although nickel mining and forestry in New Caledonia do a great deal of damage to large areas, a single unscrupulous collector can potentially wipe out a species whose natural range is only the size of a football field.

## The Non-Endemic Geckos

*Lepidodactylus lugubris*, *Hemidactylus garnotii*, *Hemidactylus frenatus*, *Hemiphyllodactylus typus* and *Nactus pelagicus* all occur on New Caledonia. The first three are thought to be introduced species. The origin of the latter two is uncertain (Bauer, 1999). *Gehyra vorax* occurs in the Loyalty Islands but has not been recorded from mainland New Caledonia.

*Lepidodactylus lugubris* is a parthenogenetic species and occurs mainly around settlements or in coastal habitats. It is very common in the city of Nouméa where two clones occur. Clone A is the most common, but Clone C also occurs in some areas. We found it was most common on buildings and coconut palms (see Bauer and Sadlier, 2000).

We did not see *Hemidactylus garnotii* at any site, but *H. frenatus* was common everywhere. It was not only on buildings in towns, but also on shrubs far from human activities. It was dis-

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appointing to be in areas that were seemingly pristine *Araucaria* forests where every plant was something unique to New Caledonia and yet hear house geckos chirping at night. In a few areas, we encountered nothing but house geckos where just six months ago *Bavayia* and *Eurydactyloides* had been the most common geckos. Although the data are only circumstantial, it seems possible that the *Hemidactylus* may be putting some competitive pressure on the endemic species. At the very least, the endemics may demonstrate seasonality with respect to density and activity that the introduced taxa do not.

*Nactus pelagicus* is also parthenogenetic and occurs throughout the region. However, we found none in the north. The southern team found them near buildings on ornamental trees. *Hemiphyllodactylus typus* was not encountered during this expedition.

## The Endemic Geckos

The geckos of New Caledonia include all known species of *Rhacodactylus*, *Bavayia*, and *Eurydactyloides*. These genera are found in New Caledonia and nowhere else on Earth.

*Bavayia* is widespread. The twelve currently recognized species can be sorted into three main species groups: *sauvagii* group, *cyclura* group, and *validiclavis* group. They each differ not only morphologically, but also in terms of habitat utilization and habitat type.

The *sauvagii*-group geckos comprise *B. sauvagii*, *B. exsuccida*, *B. pulchella* and *B. geitaina*. We found them in maquis, sclerophyll, and humid forests. At night they were on short shrubs, usually near the trunk. By day they hide under rotting logs or rocks on the forest floor. The dorsal pattern for this group is variable and appears to change in some cases between juvenile and adult. Daytime temperatures were variable depending upon habitat type. The maquis habitat was the hottest and approached 30° C in the day, dropping into the low 20°s C at night, with cooler temperatures in areas of high



*Bavayia cyclura* hanging on the underside of a *Delonix regia* branch within an urban area.



*Bavayia montana* from a high elevation humid forest in the north.

wind or coastal breezes. The mountain humid forests were cooler with highs around 26° C in the day. Nighttime temperatures in those habitats can seasonally get much lower.

The *cyclura*-group comprises *B. cyclura*, *B. montana*, *B. crassicolis*, and *B. robusta*. This group is highly variable in terms of color, body size, and habitat. It occurred in mangrove forests, sclerophyll forests, maquis, humid forests, and even on ornamental trees in yards near the coast. At night they were often a few meters up in trees. By day they hid in moist places. As these lizards are found in the greatest diversity of habitats, the many species in this group prefer very different temperature ranges in the wild. The mangrove species likely endure not only high temperatures, but also salt spray from the seawater.

Their appearance can be as diverse as their choice of habitat. Some have lemon yellow bellies and *Oedura*-like marble patterns on the back, whereas others are nearly entirely dark brown with a light peppering of gold or white flecks. The range in body size for this group is

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impressive and some rival *Rhacodactylus sarasinorum* in size!

One of the most interesting stories from the trip involved a member of the *cyclura*-group. As its name suggests, *Bavayia montana* is a mountain gecko. It can be found high in the mountain ranges where they endure very strong winds, high humidity, fog, and relatively cool temperatures. They are large geckos and typically brown, though some of those we found had *cyclura*-like banding. Some were nearly striped. The most amazing catch we had for this species was an individual that somehow fell into our vehicle while we left it parked on a mountain pass. None of us noticed for some time. Then Sarah and I each went back to the car to get some gear. She and I each opened opposite doors to the back seat of the SUV, I on the driver's side and she on the passenger's side. Shortly thereafter, she exclaimed, "there's a *Bavayia* on Ross's seat!" As she pointed, it ran away from her, across the back of the driver's seatbelt latch and jumped toward the open door where I stood. It ran fast on the floor mat and was quickly at the edge of the open doorway. I grabbed it as it jumped and ended up with the gecko caught by its hips between my middle and index finger. It writhed, defecated, and tried to bite but fortunately did not lose its tail. For the rest of the trip we referred to this individual as "truck gecko".

In addition to *sauvagii* and *cyclura* geckos, we encountered some *Bavayia* that were of the *validiclavis* group (which comprises *B. septu-*

*Bavayia validiclavis* from maquis habitat in the north.



*Eurydactylodes agricolae* is slow moving and camouflages well on small twigs.

*iclavis* and *B. validiclavis*). The *B. validiclavis* that we encountered were typically in sclerophyll or maquis habitats. At night they could be found drinking nectar from acacia flowers. When startled they would often drop from the branch to the ground without warning, disappearing into the leaf litter. Geckos of this group were among the smallest *Bavayia* we encountered and all had paired white stripes on the back. In some cases this pattern became very bold at the pelvis. They also lost their tail very easily. Daytime temperatures where we found them would reach as high as 29°C but be around 24°C at night.

The remaining two species do not easily fit into any species group, though *B. ornata* is most similar to *B. sauvagii* (see Bauer and Sadlier, 2000). *Bavayia madjo* has features of both *sauvagii* and *cyclura* groups. We encountered neither species during this expedition.

*Eurydactylodes* is a very strange genus of gecko. None of the three species (*E. agricolae*, *E. symmetricus* and *E. vieillardii*) acts like a gecko. They act more like chameleons. They are active at night and prefer to be on small twigs. There they are often found just above head-height drinking nectar from flowers. Of the three species, we found two in the north (*E. vieillardii* and *E. agricolae*) all specimens of which were in maquis habitat, though they can be found in other habitats as well (see Bauer and Sadlier, 2000).

*Rhacodactylus* is a genus of large geckos. There are currently six recognized species (*R. auriculatus*, *R. chahoua*, *R. ciliatus*, *R. leachianus*, *R. sarasinorum* and *R. trachyrhynchus*) in the genus and we found two of them.

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At one field site, about halfway through the northern trip, I stood in the parking lot for a few minutes scanning the trees with my headlamp while the rest of the group searched ahead. Within a minute I picked up an image that I will forever remember: glowing eyes. All geckos have eye-shine, but few have eye shine as large as marbles. Fortunately it was low on a tree and the gang could see it clearly given my nervous description (I'm sure the excitement in my voice made it hard to understand me.... but my thoughts were clear). Everyone saw the gecko and Todd grabbed it. My first wild *Rhacodactylus chahoua*!!! No sooner had we all taken a look at this beast and begun to disperse than I scanned up a tree not more than thirty feet from the first and saw that bright eye-shine again. This time it came from nearly seven meters up a large tree. Fortunately, as we watched the gecko it ventured onto a vine that was not connected to any large tree. Todd and Aaron began to shake the vine and the gecko dropped onto a sapling tree, but still four meters above the ground. Aaron and Todd are both rather strong guys and they bent the sapling over like an archery bow. When it was nearer to the ground, Todd jumped NBA-style and effortlessly snatched the gecko from the branch: another *R. chahoua*. These two individuals are now the only two voucher specimens of *Rhacodactylus* from this site and as such their



A male *Rhacodactylus leachianus* from a small off-shore island in Province Sud.

value to understanding the diversity of New Caledonian lizards is priceless.

Around the same time, in the south, Jonathan Kolby was jumping into a strangler fig chasing a large gecko. He grabbed it with one hand, grabbed it with the other, and then realized gravity still owned him. He slid down the tree approximately three meters to the ground, with a growling, jaw-snapping male *R. leachianus* in his hands. The only other *leachianus* I saw during the trip had been “collected” by a domestic cat and its hind limbs had been eaten. The owner of the cat had given the gecko, presumably dead already, to the research station in Nouméa where it waited for us in the freezer.

## Summary

Although mining, and other human activities, has taken its toll on the landscape of New Caledonia, hope still remains. The mining companies now leave parts of the land as reserves and seem to have some level of genuine interest in the native wildlife. Additionally, the region's policies on wildlife collecting and export will help curtail the number of endemic taxa that unscrupulously end up in pet store cages or in deli cups at expos. Recently, the World Wildlife



The author with a friend on his shoulder.  
Photo: Ross Sadlier



This *Rhacodactylus chahoua* was the first of the genus encountered by the author in the wild.

Fund has started a long-term project in New Caledonia geared at saving land and educating the public on the unique natural history of this isolated land. The Parc Forestier (New Caledonia's zoo) and L'Aquarium de Noumea also have many education programs and breeding projects involving species endemic to the region.

I will always have fond memories of my time in New Caledonia. The friendships, the geckos, the scenery and even the baguettes and cheap beer. I look forward to the day when I may return. There are surely more geckos to be found there in the forgotten places of this land lost in time.

## Literature Cited

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*All photos by the author except where noted*

