Preliminary Report for 2004 Fieldwork on the Lizard Fauna of Vanuatu

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This is a preliminary report for fieldwork conducted between 27 June 2004 through 21 August 2004. During this time, I conducted research on seven islands in Vanuatu: Efate, Aneityum, Futuna, Tanna, Ambae, Pentecost, and Erromango. Lizards were collected during visual surveys during both daylight and evening hours and from a variety of habitats on each island. Although an effort was made to search all habitats, it is likely that these species list generated for each island may be incomplete due to the short duration of each survey period. Lizards were collected by hand, with the use of a blowgun, and with the assistance of local villagers. Specimens were taken only when necessary. For commonly observed species, a small number of voucher specimens was taken at each locality and the remaining individuals were released following identification. When possible, only tail tips were collected for molecular research, and lizards were subsequently released. Tissue samples were stored in 95% ethanol in the field. Specimens were field preserved using 4% formalin. Specimens collected during this field season will be transferred to 70% ethanol for storage at Louisiana State University Museum of Natural Sciences in the United States.

Included in this report are distributional data for lizard species from Vanuatu based on 2004 fieldwork. Observations on ecology and habitat use recorded during this field season are also presented. Significant findings from this field season include broader distributions than previously recognized for some species, and the identification of a potential new species endemic to Vanuatu.

Notes on Lizard Species Occurrence, Abundance, and Habitat Use (by Island)

Efate:

Emoia cyanura
Emoia cyanogaster
Emoia nigromarginata
Emoia sanfordi
Gehyra oceanica
Lepidodactylus lugubris
Lipinia noctua
Nactus pelagicus

Fieldwork was conducted at two separate sites on Efate: on the northeast coast at Epau and the northwest coast around the grounds of Ulei Secondary School, near the village of Tanoliu. *Emoia sanfordi* was relatively abundant at Epau, and was observed in a variety of habitats. It was most frequently seen in coconut plantations. *Emoia sanfordi* appeared to be quite rare at Tanoliu. The species was occasionally observed in areas of coconut plantations. Despite extensive searching, it was not seen in more densely forested areas. Only one *E. sanfordi* was collected at Tanoliu; this specimen was found in the top of a coconut tree by a student from the secondary school.

The gecko species *Nactus pelagicus* was commonly found under rock piles and piles of copra in Epau. This species was also found in Tanoliu, but did not appear to be as common.

Aneityum:

Emoia cyanura
Emoia aneityumensis
Emoia nigromarginata
Caledoniscincus atropunctatus
Gehyra oceanica
Lepidodactylus lugubris
Lipinia noctua
Nactus pelagicus

The large-bodied skink, *E. sanfordi*, does not occur on Aneityum. However, another apparently closely related large skink, *E. aneityumensis*, occupies the same habitat niche. This species is very common on Aneityum and was observed in coconut plantations and forested areas consisting of mixed hardwood species. A second arboreal species of skink, *E. nigromarginata*, was also found to be common on Aneityum. Its habitat use appears similar to that of *E. aneityumensis*.

Caledoniscincus atropunctatus was observed to be exclusively terrestrial, and very common under leaf litter on the forest floor. The genus *Caledoniscincus* is associated with New Caledonia, and the presence of this species on Aneityum has been previously considered to be extra-limital by other researchers.

Nactus pelagicus is a species of particular interest on Aneityum, as previous researchers have suggested that two races of this lizard (bisexual and parthenogenetic) co-occur on this island (Moritz, 1987). I found *N. pelagicus* to be less common than expected. Individuals were found under stones and piles of rocks, but did not occur under dry wood and piles of coconut husks, as on Efate and other islands where research was previously conducted.

Futuna:

Emoia cyanura
Emoia erronan
Emoia sp. nov.
Gehyra oceanica
Lepidodactylus lugubris
Lipinia noctua
Nactus pelagicus
Cryptoblepharus novahebredensis
Caledoniscincus atropunctatus

Emoia sanfordi and *E. aneityumensis* were both absent from Futuna. However, another closely related skink, *E. erronan*, was fairly abundant. According to Brown (1991), this species is endemic to Futuna. Observations on Futuna indicate that this species is highly arboreal and appears to occupy the same niche as both *E. sanfordi* and *E. aneityumensis* on other islands. A second large arboreal skink was collected from Futuna. This species is thought to represent an undescribed species. After this lizard's species status is verified by morphological and molecular analysis, I will inform the Environment Unit. Should this prove to be a new species of *Emoia*, it is likely endemic to Futuna and represents the second new *Emoia* species discovered during my work in Vanuatu.

Caledoniscincus atropunctatus was very common on Futuna. The range of this species within Vanuatu was previously thought to be limited to Aneityum. Thus, its presence on Futuna indicates a broader distribution.

Nactus pelagicus was extremely rare on Futuna. Despite intensive searching, only a few specimens were collected.

Cryptoblepharus novahebredensis was common along the coast and rocky areas of the shoreline. This species was not seen in any other habitat.

Tanna:

Emoia cyanura
Emoia cyanogaster
Gehyra oceanica
Lepidodactylus lugubris
Lipinia noctua
Nactus pelagicus
Caledoniscincus atropunctatus

No large-bodied skinks were seen in Tanna, nor were any large-bodied *Emoia* specimens recognized by local villagers. Fieldwork on Tanna was conducted at only one site, Port Resolution. It is possible that large *Emoia* are present elsewhere on the island.

Nactus pelagicus were quite abundant and were found in a variety of habitats, such as under tree bark, rotting wood, piles of rocks, and piles of drying coconut husks. Both males and females were found, indicating the presence of a bisexual population. Data published previously by Moritz reported the presence of only a parthenogenetic population on Tanna.

Caledoniscincus atropunctatus was very common on Tanna. The range of this species within Vanuatu was previously thought to be limited to Aneityum. Thus, its presence on Tanna and Futuna, as previously mentioned, indicates a broader distribution.

Ambae:

Collections on this island were very limited, as this is my second trip to Ambae. The purpose of this trip was not general survey work, but to collect specific data found to be necessary after preliminary analysis.

Emoia cyanura
Emoia cyanogaster
Emoia nigra
Emoia sanfordi
Emoia sp. nov. (Identified during 2002 fieldwork)
Nactus pelagicus
Ramphytophlops braminus

Fieldwork on this island was narrow in its focus and limited in duration. The main goal of work on Ambae was to supplement data collected for *E. sanfordi* and individuals of a new species discovered during my 2002 fieldwork. Observations this year suggest that these two species appear to use the same habitat, as both were collected from coconut plantations and forested areas of mixed hardwood species.

An interesting collection of two *R. braminus* was made in coconut plantations on Ambae. This small snake was found under piles of coconuts in areas of moist soil. Its habitat use appeared similar to that of *N. pelagicus*. This introduced species did not seem to be very common.

Pentecost:

Emoia cyanura
Emoia cyanogaster
Emoia nigra
Emoia sanfordi
Gehyra oceanica
Gehyra vorax
Nactus pelagicus

Emoia sanfordi was most common in coconut plantation areas. On Pentecost, this species was not as common in areas of secondary forest, despite intensive survey work.

Emoia nigra was extremely abundant. It was the dominant member of the terrestrial lizard fauna, being even more common than its counterpart, *E. cyanura*.

Nactus pelagicus was very common on Pentecost and was found in a variety of habitats: under tin, around houses in villages, coconut plantations, under rocks, in areas of moist soil, under piles of coconut husks, and in areas of dense secondary forest.

Two specimens of *G. vorax* were collected from this island. These specimens were found on large trees. This species appears to be fairly common on Pentecost.

Erromango:

Emoia cyanura
Emoia cyanogaster
Emoia sp.
Gehyra oceanica
Lepidodactylus lugubris
Lipinia noctua
Nactus pelagicus
Caledoniscincus atropunctatus

The absence of *E. sanfordi* on Erromango was tempered by the presence of an as-yet unrecognized large-bodied *Emoia*. I am not positive whether these specimens represent a new species or are simply morphologically variable members of the species *E. aneityumensis*. Observations on Erromango indicate that this species is highly arboreal

and appears to occupy the same niche as both *E. sanfordi* and *E. aneityumensis* on other islands. After this lizard's species status is elecidated by morphological and molecular analysis, I will inform the Environment Unit of its status.

Caledoniscincus atropunctatus was very common on Erromango. The range of this species within Vanuatu was previously thought to be limited to Aneityum. Thus, its presence on Erromango, along with the other islands surveyed in Tafea Province (Tanna anf Futuna) indicates a much broader distribution within Vanuatu.

Nactus pelagicus was relatively rare on this island. Specimens were collected from under rocks in garden areas, as well as from rocky areas in dense forests.

Plans for Continued Fieldwork

When I return to LSU in August, I will continue ongoing research on the reconstruction of the evolutionary relationships of the large-bodied *Emoia* species in the *Emoia samoensis*-group designated by Brown (1991). Completion of this project is now possible, due to the collection of tissues of *E. nigromarginata, E. erronan,* and several potential new species. I will also begin determining the status of new species collected during 2002 and 2004 fieldwork and will send copies of all resulting new species descriptions to the Environment Unit once they are published.

I also will continue to examine the population genetic data for nuclear and mitochondrial gene regions for *E. sanfordi* and *N. pelagicus* from islands throughout Vanuatu. As patterns of population history begin to emerge, I will compare them with geologic history to enable an interpretation of patterns of speciation events in Vanuatu.

I plan to return to Vanuatu in 2005 to finish data collection on a few islands I have not yet been able to survey (primarily Ambrym, Epi, and the Shepherd's group). I will likely wish to revisit a few previous survey sites to collect additional data.

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