

**Notes on the Biology
of the Green Tree Skink
Lamprolepis smaragdina philippinica
(Scincidae) in
Siquijor Island, Philippines**

Abner A. Bucol
Silliman University Angelo King Center for Research
and Environmental Management

Michael Lawton R. Alcala
Biology Department
Silliman University

Rosalina Catid
Siquijor State College
Larena

Jocelyn Elise Basa
Biology Department
Silliman University

Irish Sequihod
St. Paul University
Dumaguete City

Albert Pagente
Siquijor State College
Larena

Will Kilat
Siquijor State College
Larena

Observations on the biology of the Green Tree Skink *Lamprolepis smaragdina* were conducted in Siquijor Island, Philippines. Morphological features such as body proportions, scale counts, and coloration of the population in Siquijor were contrasted with those from neighboring population on Negros Island. The population density of the species was also determined. Incidental observations on the foraging behavior are also presented.

KEYWORDS: biology, behavior, *Lamprolepis smaragdina*, skink, Siquijor

INTRODUCTION

The Green Tree Skink *Lamprolepis smaragdina philippinica* Mertens, 1929 is widely distributed from Taiwan and the Philippines southward and eastward, through the Indo-Australian Archipelago, to northern Australia (Cape York), the Solomon Islands, Santa Cruz Islands, and to easternmost parts of Micronesia (Brown & Alcala, 1980; Perry & Buden, 1999; Iskandar & Erdelen, 2006; Linkem et al., In Press).

The species is characterized by having only the head and anterior part of the body green and the rest of the body brown (Brown & Alcala, 1980; Brown et al., 1996). However, some of its populations in small islands like in Micronesia (Perry & Buden, 1999), Caluya Island (Siler & Linkhem, 2011) and Siquijor (this study) in the Philippines are generally green with black blotches on dorsum while the brown or rufous region is limited only in the proximal dorsal portion of hind limbs.

METHODS AND MATERIALS

On several occasions, we made several opportunistic observations on the biology of *Lamprolepis smaragdina* in Siquijor (Figure 1) on the following dates: 15-20 February, 18-20 March, 05-08 April, 15-16 May, 20-21 June, and 16 July, 2011.

In addition, short-term observations of the species in other islands such as in Luzon (15 May 2009), Negros (July, August, September 2009), Panay and associated smaller islands of Gigantes (15 December

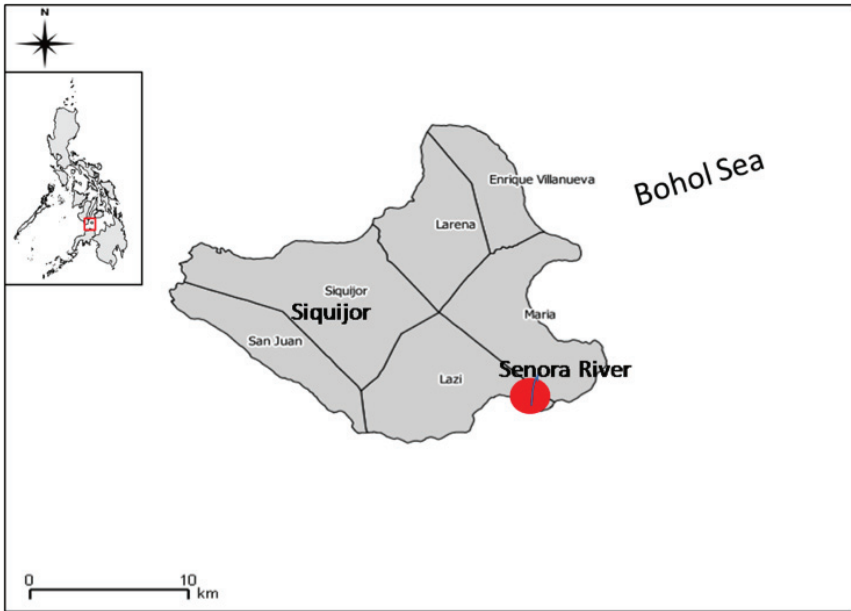


Figure 1. Map of Siquijor Island showing the location of the study area.

2009) and off Carles, Nasidman and Calbasas off Ajuy (12 May 2010) made by the first author were also noted.

Preserved specimens at the Silliman University-Rodolfo Gonzales Museum of Natural History (SU-RBG) were also examined.

RESULTS AND DISCUSSION

Morphological Variations

In most regions within the Philippines, the species is characterized by having only the head and anterior part of the body green and the rest of the body brown (Brown & Alcala, 1980; Brown et al., 1996). The color pattern of the population in Negros appeared consistent in other populations such as in Luzon, Mindanao, Panay and associated islets except in Caluya (see photos by C.D. Siler in Herpwatch.org). The population in Siquijor has generally green body with black longitudinal streaks forming obscure blotches on dorsum while the brown or rufous region is limited only in the proximal dorsal portion of hind limbs.



Figure 2. Live photo of the Green Tree-skink (*Lamprolepis smaragdina*) in Lazi, Siquijor. Photo by J.E. Basa.

A summary of the morphometric features of the skink is presented in Table 1. Compared with the available specimens of the neighboring population in Negros Island, the Siquijor population appears to have [1] higher SVL measurements (76-105mm vs. 83mm SVL); [2] higher dorsal (48-51 vs. 42-44) and ventral scale counts (52-59 vs. 51); and [3] color (predominantly green vs. generally brownish). These characteristics were consistent in both juvenile and adult stages of the two populations.

The overall green coloration of isolated population in Siquijor Island (Figure 2) has been documented elsewhere such in Micronesia (Perry & Buden, 1999) and Indonesia (Iskandar & Erdelen, 2006). This

Table 1.

Summary of Morphometric Features of *Lamprolepis smaragdina* in Siquijor.

Characters	N	Mean±S.E.	Ranges (mm)
Total Length (mm)	7	245.57±9.39	217-283
Snout-Vent Length (mm)	8	97.63±3.28	76-105
Tail (mm)	6	142.67±7.37	130-178
Axilla-Groin Distance (mm)	8	49.75±1.81	41-57
Forelimb (mm)	8	33.63±0.65	30-36
Hind Limb (mm)	8	42.25±1.51	34-47
Head Width (mm)	8	13.88±1.18	10.5-19
Head Length (mm)	5	21.90±0.33	21-23
Body width (mm)	8	19.25±1.01	15-23
Dorsal Scales	8	49.50±0.42	48-51
Ventral Scales	8	55.25±0.84	52-59
Axilla-Groin Scales	7	32.00±0.69	29-34
Upper Labial Scales	8	7.88±0.23	7-9
Lower Labial Scales	8	7.88±0.23	7-9
Fourth toe Lamellae	8	33.25±1.50	30-43

case might be attributed to “founder effect” as suggested by Perry and Buden (1999).

It should be noted that Siquijor Island has been isolated from the rest of the Visayan Ice-age Islands (also known as the Visayan Pleistocene Aggregate Island Complex by other authors) during the last glacial maxima (Brown et al., 2001, 2008). A molecular phylogenetic study of the *L. smaragdina* by Linkhem et al. (*In Press*) revealed that the population in Siquijor is more affiliated to the populations in Camiguin Sur and Palawan and not of the Negros and neighboring islands like Bohol. Aside from *L. smaragdina*, another lizard (*Draco spilopterus*) has been known to exhibit slight morphological variation in Siquijor (e.g., color differences; McGuire & Alcala, 2000; McGuire & Heang, 2001).

Habits and Behavior

The species is generally arboreal but may reach the ground and nearby man-made structures when foraging (Reyes, 1957; Brown & Alcala, 1980; Buden, 2000). The species was often encountered foraging on trees, especially near colonies of ants and termites. It was also seen in

mangroves, probably feeding on insects. In one occasion, it was seen feeding on the flying lizard (*Draco spilopterus*) in Siquijor (E. Basa and M.L.R. Alcala, pers. obsrv.).

Sightings of active *L. smaragdina* (presumed foraging) were usually between 09h00-14h00, with ambient temperatures ranging from 26-30°C. The skinks were not observed during heavy downpour of rain. Skinks were also seen basking about 30 minutes after a short duration of rain had completely stopped.

Population Density

In a coconut plantation (with an area of 0.5 ha) in Lazi, Siquijor, we counted 22 individuals, thus the species' extrapolated population density would be 44 individuals/hectare in that area alone. It appears that the density of the green skink is dependent on the availability of trees. This species is most frequently observed in coconut plantations around Siquijor's heavily populated coastal areas.

It is interesting to note the significant decline (from about 1,500 individuals in the early 1960s to about 10 individuals in 2010) in the population of *L. smaragdina* in Silliman University Campus where A.C. Alcala monitored the population of *L. smaragdina* for at least three years (1962-1965). Although the number of rain trees (*Samanea saman*) is more or less the same as it was in the 1960s, it is possible that the skink's food items (mainly Lepidoptera, Coleoptera and Hymenoptera) may have declined as a result of recent developments such as construction of new concrete buildings. Another potential reason for the species' population decline is that more skinks may have been sacrificed for classroom studies (as initiated earlier by Reyes, 1957). These possibilities, however, needs further quantitative investigations.

CONCLUSIONS AND RECOMMENDATIONS

The above findings highlight the need to conduct a more detailed study on the biology of the green skink *L. smaragdina* in Siquijor Island. There is also a need to monitor the population of this arboreal skink because most of Siquijor's forests have been converted to open agricultural lands, mainly for corn and cassava.

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REFERENCES

- Alcala, A.C. (1966). Populations of three tropical lizards on Negros Islands, Philippines. Dissertation. Stanford University. 269p.
- Brown, W. C. & Alcala, A.C. (1980). *Philippine lizards of the family Scincidae*. Silliman University Natural Sciences Series No. 2. Dumaguete City, Philippines: Silliman University Press.
- Brown, R. M., Ferner, J.W., Sison, R.V., Gonzales, P.C., & Kennedy, R.S. (1996). Amphibians and reptiles of the Zambales mountains of Luzon Island, Republic of the Philippines. *Herpetological Natural History*, 4(1), 1-22.
- Brown, R.M., Oliveros, C.H., Siler, C.D., & Diesmos, A.C. (2008). A new Gekko from the Babuyan Islands, Northern Philippines. *Herpetologica*, 64(3), 305-320.
- Buden, D.W. (2000). The Reptiles of Sapwuahtik Atoll, Federated States of Micronesia. *Micronesica*, 32(2), 245-256.
- Esselstyn, J.A., Oliveros, C.H., Moyle, R.G., Peterson, A.T., McGuire, J.A. & Brown, R.M. (2010). Integrating phylogenetic and taxonomic evidence illuminates complex biogeographic patterns along Huxley's modification of Wallace's Line. *Journal of Biogeography* 2010, 1-13.
- Iskandar, D.T. & Erdelen, W.R. (2006). Conservation of amphibians and reptiles in Indonesia: Issues and problems, 4(1), 60-87.
- Linkem, C. W., Brown, R. M., Siler, C.D., Evans, B. J., Austin, C.C., Iskandar, D.T., Diesmos, A.C., Supriatna, J., Andayani, N., & McGuire, J. A.. (In Press). Stochastic faunal exchanges drive diversification in widespread Wallacean and Pacific Island lizards (Squamata: Scincidae: Lamprolepis smaragdina). *Journal of Biogeography*, 40, 507-520.
- McGuire, J.A. & Alcala, A.C. (2000). A taxonomic revision of the flying lizards (Iguania: Agamidae: Draco) of the Philippine Islands, with a description of a new species. *Herpetological Monographs*, 14, 81-138.
- McGuire, J.A. & Heang, K.B. (2001). Phylogenetic systematics of Southeast Asian

flying lizards (Iguania: Agamidae: Draco) as inferred from mitochondrial sequence data. *Biological Journal of the Linnean Society*, 72, 203-229.

Perry, G. & Buden, D.W. (1999). Ecology, behavior and color variation of the green tree skink, *Lamprolepis smaragdina* (Lacertilia: Scincidae), in Micronesia. *Micronesica*, 31(2), 263-273.

Reyes, A. Y. (1957). Notes on the food habits of a Philippine skink *Dasia smaragdina philippinica* Mertens. *Silliman Journal*, 4, 180–191.

Siler, C.D. & Linkem, C.W. (2011). *Lamprolepis smaragdina philippinica* (Emerald Green Tree Skink. Color variation. *Herpetological Review*, 42, 605.

MATERIALS EXAMINED

Lamprolepis smaragdina philippinica

SIQUIJOR ISLAND (1 specimen), Siquijor, Caticugan, coll: A. Bucol, L. Averia, and M.L.R. Alcala; 7 August 2010; (7 specimens); Lazi town; coll: A. Bucol, M.L.R. Alcala, E. Basa, I. Sequihod, and R. Catid; 1 July 2011.

NEGROS ISLAND, Damsite, Murcia, Negros Occidental; coll: Bago River Project Team; 12 February 2010; 1 specimen.