Black Iguanas (*Ctenosaura similis*) are among the most visible of Costa Rican reptiles, occurring in various habitats throughout the country.

Ticks (*Amblyomma* spp.) on Black Iguanas (*Ctenosaura similis*) in Costa Rica

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Reptiles can be exposed to various ectoparasites, some of which carry diseases or otherwise negatively affect their populations (Hanley and Stamps 2002, Wikelski 1999). Conventional wisdom suggests that animals with high parasite loads must be in worse physical condition than animals with lower infestations, but this assumption has not been documented in many reptiles. In the United States, a number of exotic ectoparasites have been introduced with their reptilian hosts (Burridge and Simmons 2003). Predicting the fates of these reptile-associated introductions is difficult without greater knowledge of the parasite-host systems. Data presented here on tick infestations of free-ranging Black Iguanas (*Ctenosaura similis*) from Palo Verde National Park, Costa Rica will add to the general body of knowledge for these kinds of systems.

In July 1996, I caught 20 *C. similis* (mean = 873 g, 240–2,080 g) near the Organization of Tropical Studies (OTS) Palo Verde Biological Field Station (10°21'N, 85°21'W; elevation ~10 m) by noosing them on branches or capturing them by hand in holes. Each animal was measured (SVL, to nearest cm), weighed (to nearest g), and the ticks on each were counted and classified visually into three size classes: small (< 2 mm), medium (2–4 mm), and large (> 4 mm). I also classified the shedding status of the iguana as recently shed, old shed, or shedding, depending on whether they had bright new skin without remnants of an old shed, some remnants of shed at the joints, or widespread larger patches of shedding epidermis, respectively. I used a non-parametric Kruskall-Wallis test to compare the effects of the shedding status on the number of ticks. The Fulton

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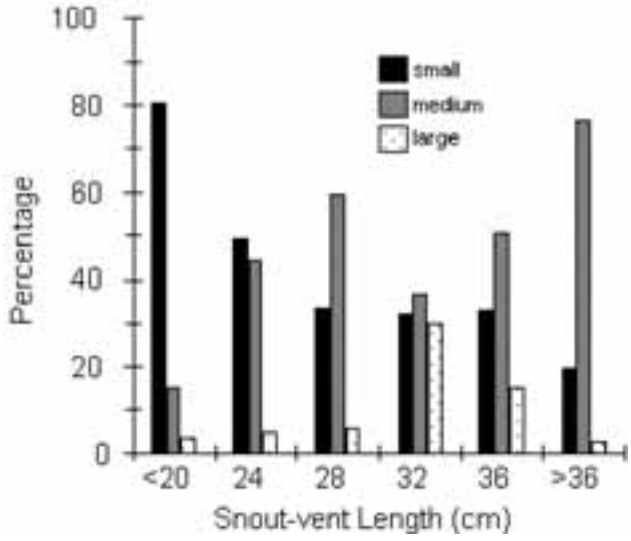
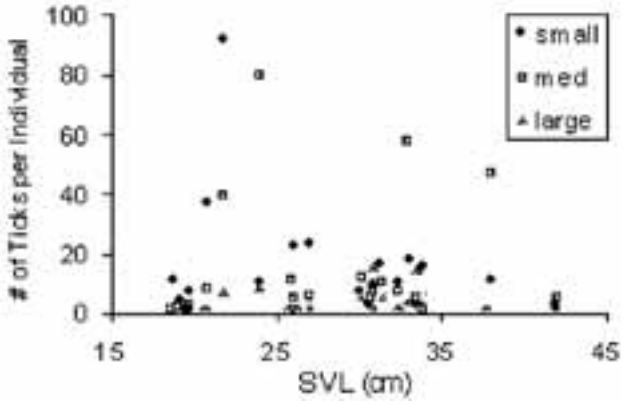
Even heavy tick infestations on free-ranging Black Iguanas (*Ctenosaura similis*) in Costa Rica seem to have little effect on the lizards' body conditions.



Percentage of each tick size class found on the different sizes of *Ctenosaura similis* in Palo Verde National Park, Costa Rica.



Number of ticks in each size class found on the different sizes of *Ctenosaura similis* in Palo Verde National Park, Costa Rica.

Index (Bolger and Connoly 1989) is a condition index that is calculated by dividing the mass of an individual by the cubic power of its length. I used Spearman correlation tests to assess the effects of tick infestations on the condition of the ctenosaurs and the effects of body size on the number of ticks present per individual.

I recorded two tick species on *C. similis*: *Amblyomma scutatum* and *A. dissimile*. *Amblyomma scutatum* was more abundant than *A. dissimile*. The mean number of ticks per animal was 56 (0–217). Only one animal did not carry ticks. I found no significant relationship between the total number of ticks

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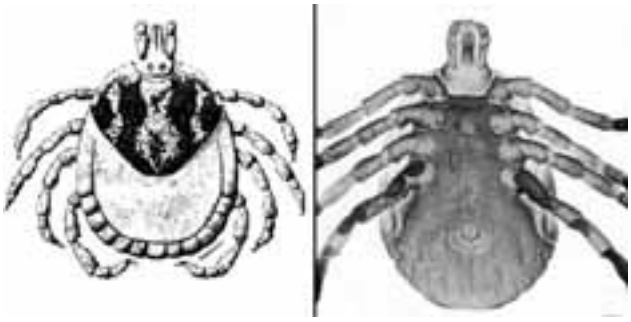
Ticks (*Amblyomma scutatum*, top; *A. dissimile*, bottom) embedded in the skin of Black Iguanas.



Ticks frequently found on Black Iguanas (*Ctenosaura similis*) in Costa Rica: *Amblyomma scutatum* (left) and *A. dissimile* (right).

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Unlike ctenosaurs in Palo Verde National Park, those in the dry forest in Puntarenas often are free of parasites. This individual had sought shelter in the hollow core of a fallen tree.

and the size of individual ctenosaurs (r = 0.18, P = 0.46; N = 20), but smaller *C. similis* seemed to have more small ticks, and medium-sized ticks seemed to be more abundant on larger ctenosaurs. Large ticks occurred in relatively low numbers across all sizes of ctenosaurs. Four animals had shed recently, seven were in the process of shedding, and eight had old skins. I found no significant differences in the number of ticks among the three shedding categories (Kruskall-Wallis test; $\chi^2 = 0.69$, P = 0.71).

Most of the study animals had a heavy tick load, but heavily infested animals did not appear to be in poorer physical condition. No correlation existed between the number of ticks and the condition of the animal as estimated with Fulton's Index (r = -0.38, P = 0.10; N = 20), suggesting that ticks may not be a burden to healthy ctenosaurs. Both this lack of relationship and the lack of relationship between shedding status and the number of ticks were unexpected. Both findings could be explained by a fast turnover of ticks on individual ctenosaurs, where each tick may spend but a short time on a given animal before attaching itself to another animal that has just shed. In view of the large number of exotic animals moving across national boundaries due to the pet trade, we must consider the potential effect of seemingly healthy animals introducing their parasites as well.

Acknowledgments

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Sonoran Mountain Kingsnake Survey

The Nevada Department of Wildlife and Great Basin National Park are pleased to announce the 3rd Annual Great Basin Sonoran Mountain Kingsnake Survey on 12–16 May 2008. For more information contact: Bryan Hamilton (bryan_hamilton@nps.gov).

BRYAN HAMILTON

The Sonoran Mountain Kingsnake (*Lampropeltis pyromelana*) inhabits rocky mountain habitats from 850–2,800 m in the western United States and adjacent regions in Mexico.