

# Ectoparasite loads of urban Texas horned lizards (*Phrynosoma cornutum*)

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## INTRODUCTION

- Texas horned lizards are a threatened species in Texas but still persist in some small Texas towns.
- In town they can be found at much higher densities (~50 lizards/ha) than in natural areas (3-10 lizards/ha).<sup>2,3</sup>
- Lizards are hosts for ectoparasites such as mites and some individuals in a population have relatively low parasite load while a few individuals are heavily parasitized.<sup>4</sup>
- As larvae, trombiculid mites are parasitic and feed on digested, liquefied skin until they fully engorge, drop off, and molt into the nymph stage (Fig. 2).<sup>5</sup>
- Ectoparasites have been relatively unstudied in horned lizards, and the objective of this study was to explore ectoparasite loads of Texas horned lizards living in an urban environment.



Figure 1. Texas horned lizard.

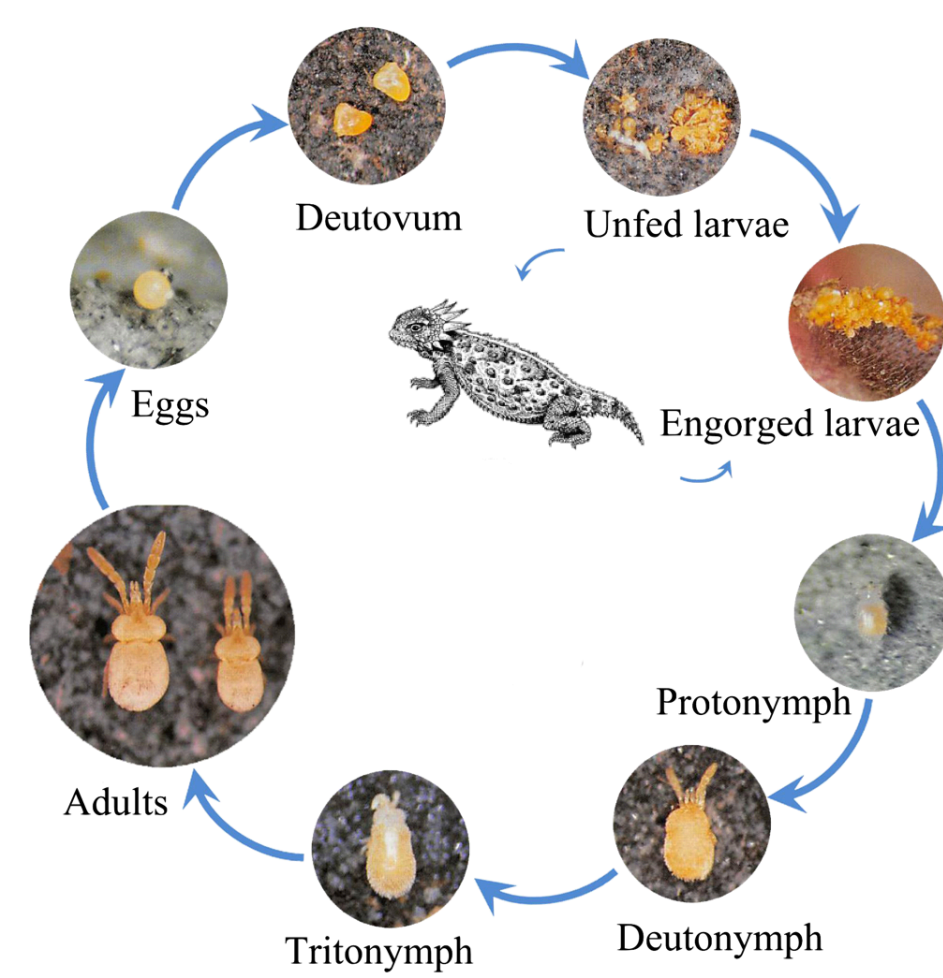


Figure 2. Trombiculid mite life cycle.

## METHODS

- We examined ectoparasite loads by performing daily transects at different sites within our field locations (Fig. 3, 5).
- Once we had found and captured a lizard we would record its sex, weight, SVL, and pit tag number.
- We would record if the lizard had ectoparasites and where they were located on the lizard's body.
- We would count individual mites on the lizard using loops or a hand lens (Fig. 5).
- If a lizard was heavily parasitized, we would take a picture of the area and blow up the picture to get an accurate count (Fig. 4).

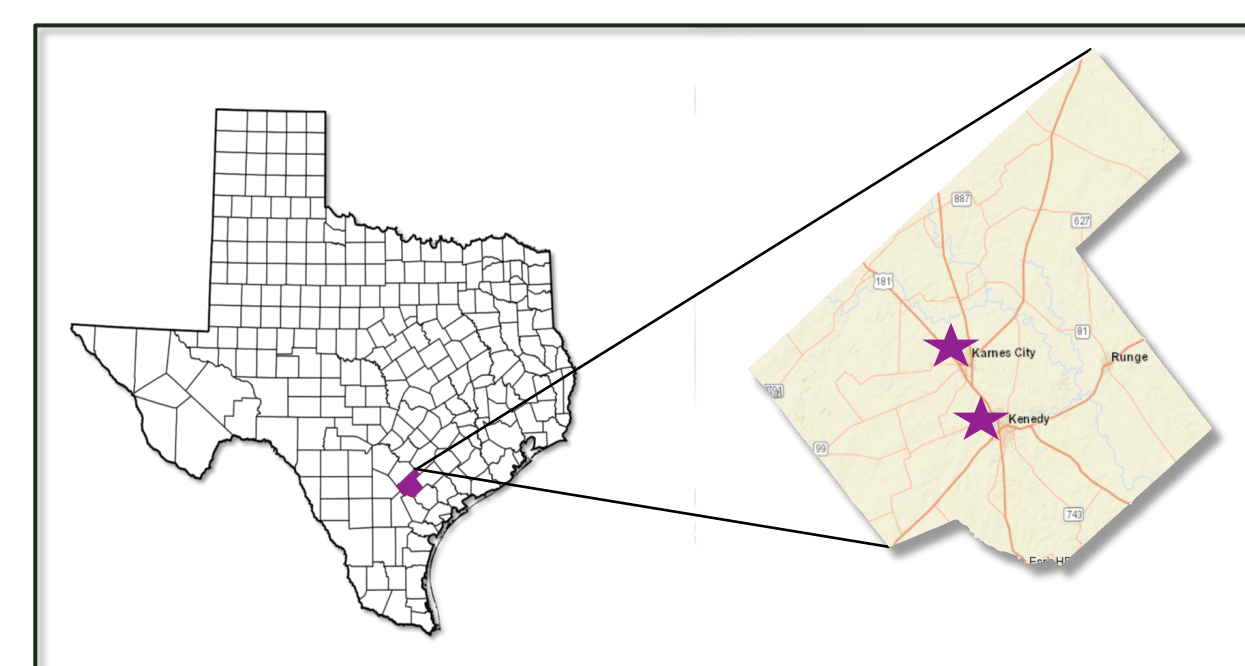


Figure 3. Map of our field sites in Kenedy and Karnes City, Karnes County, Texas.

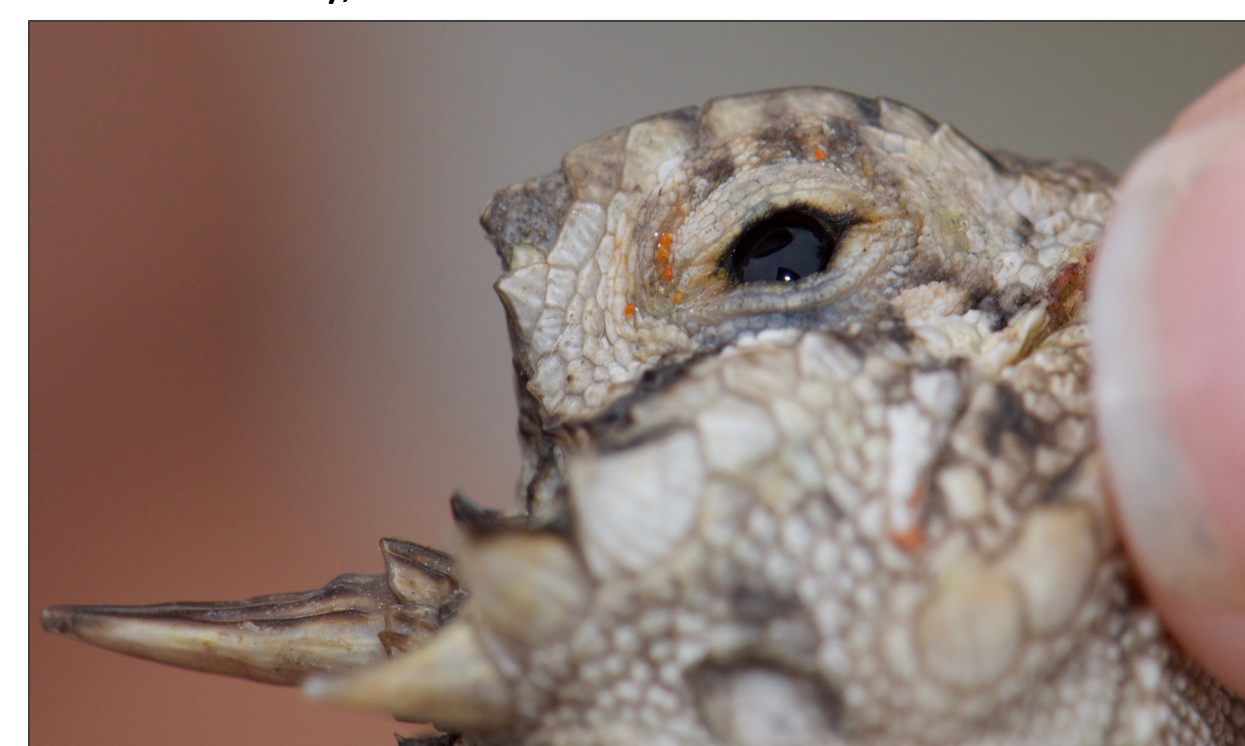


Figure 4. Texas horned lizard with mites around the eye area.

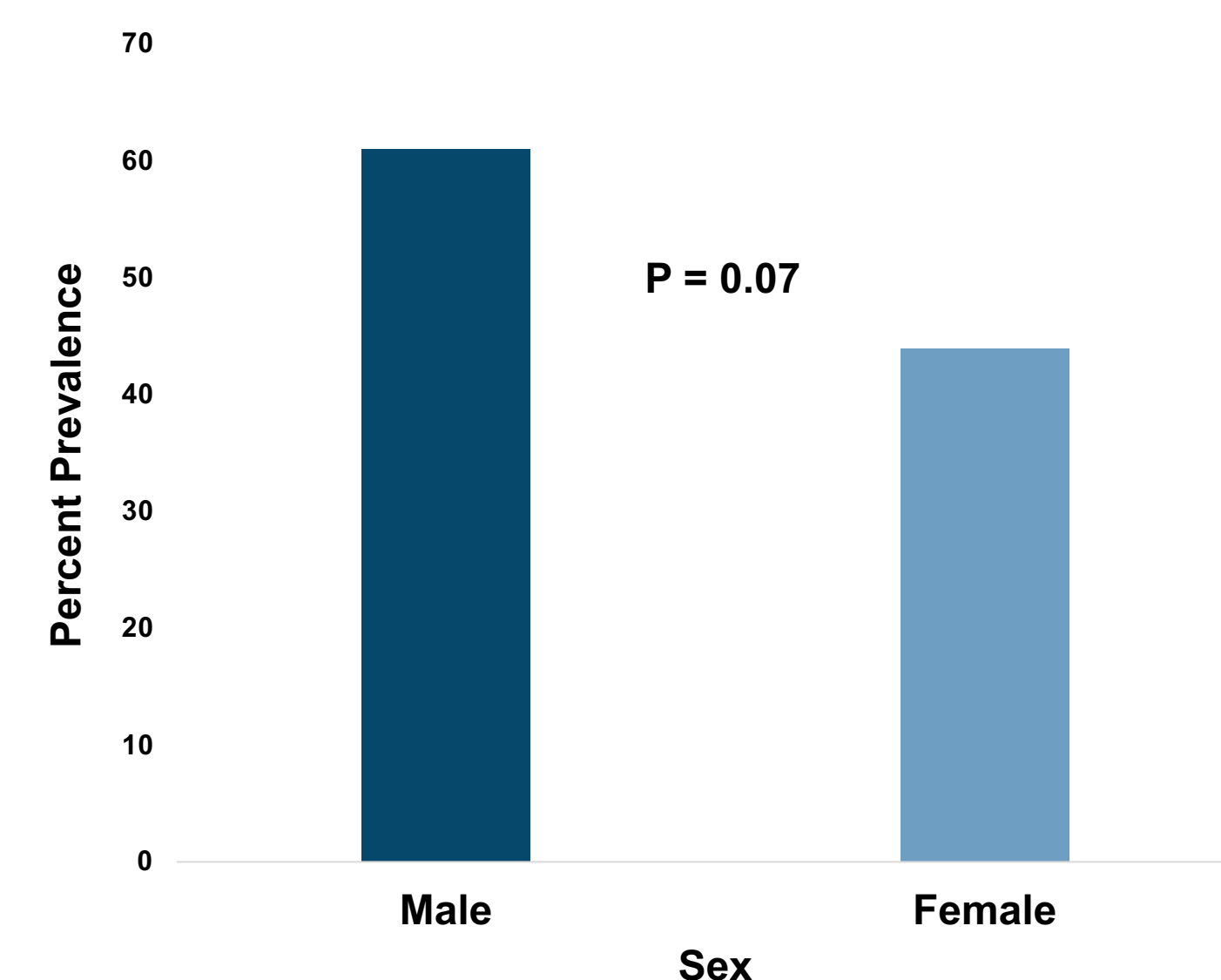


Figure 5. Cluster of ectoparasites on skin folds in gular region (left). Horned lizards were examined for ectoparasites using loops (center). Transects were performed daily to find horned lizards (right).

## RESULTS

### Were there differences in parasite prevalence between males and females?

NO



- Prevalence = infection status only (i.e. infected or not infected)
- We observed no significant difference between males (N=41) and females (N=41) (P = 0.07) (Fig. 6).

Figure 6. Percent individuals infected by sex.

### Was body condition correlated with parasite load?

NO

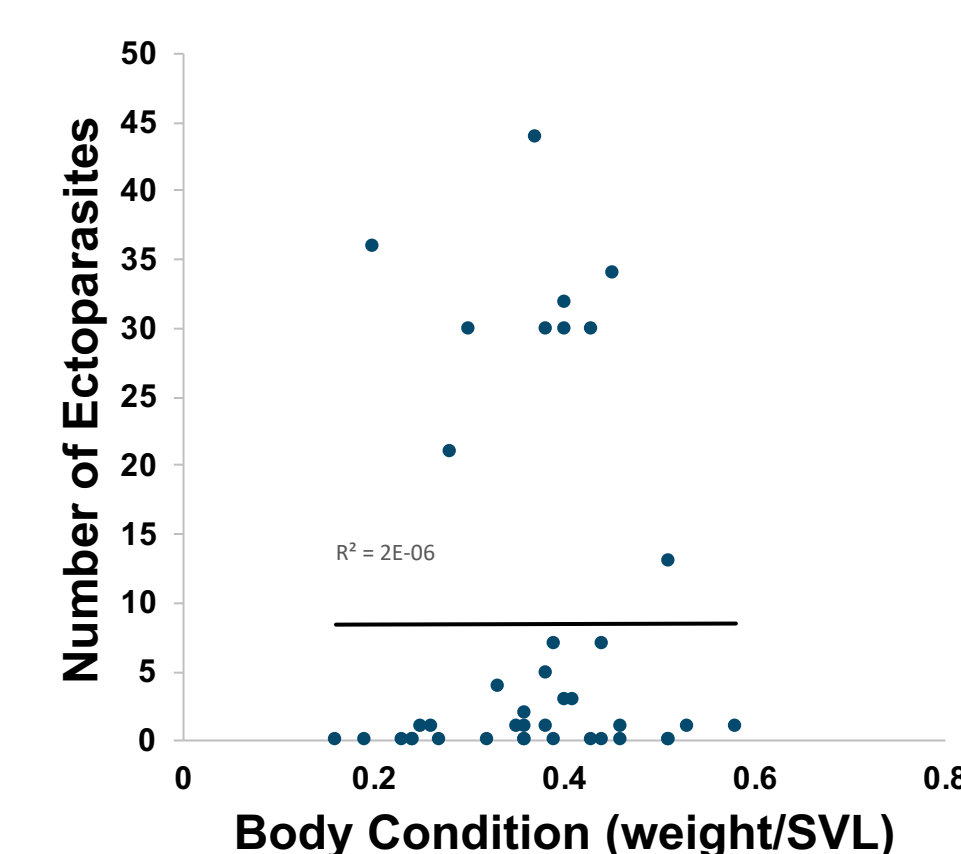


Figure 7. Number of ectoparasites vs. body condition for the male population.

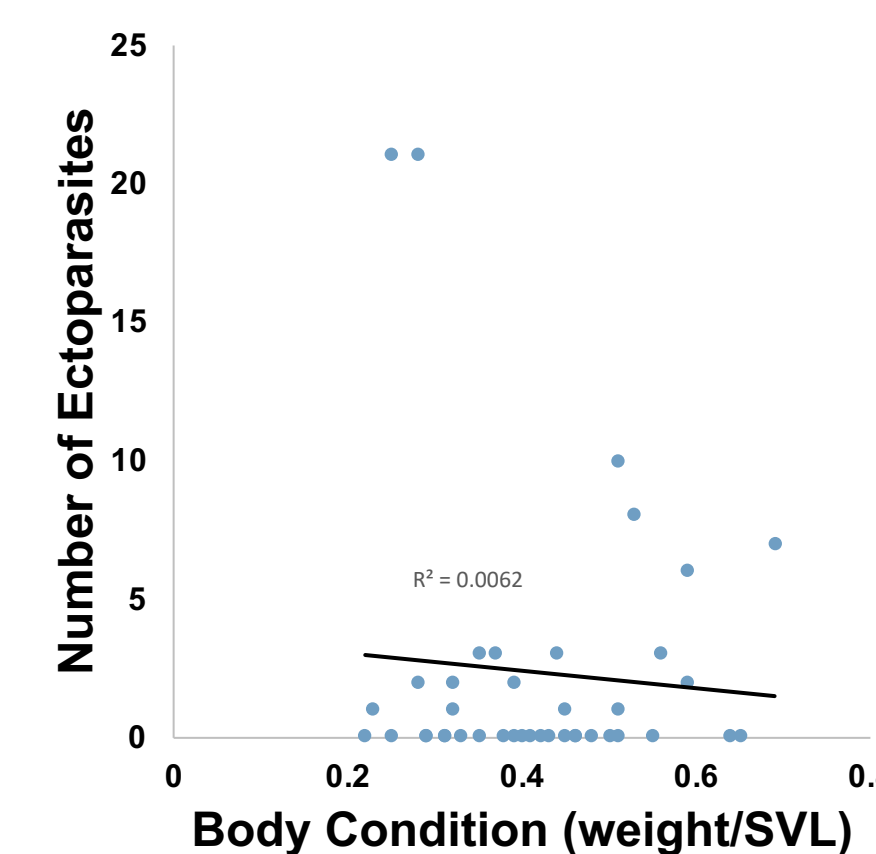


Figure 8. Number of ectoparasites vs. body condition for the female population.

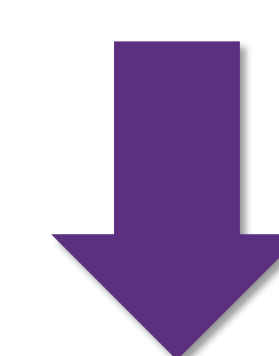
- Increased numbers of ectoparasites have been shown to decrease body condition.<sup>5</sup>
- We observed no correlation between body condition and number of ectoparasites for both males and females (Fig. 7-8).

### Were there differences in ectoparasite loads between males and females?

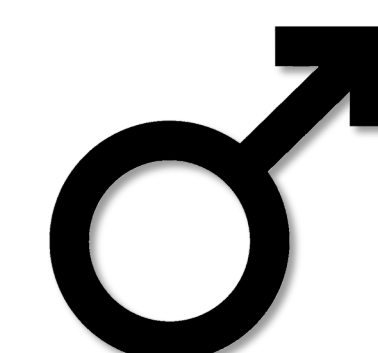
YES

- To determine the effects of sex, body condition, and habitat on ectoparasite load, we used a generalized linear model with a negative binomial distribution.
- Model selection was carried out in a stepwise manner.
- The best model was chosen by the lowest AIC value.
- The results indicate that only males are a significant predictor of the number of ectoparasites.

Number of Ectoparasites ~ Sex (M or F) + Body Condition (grams/mm) + Habitat (Alley or Field)



\* Males  
P < 0.001



## RESULTS

### Did ectoparasites prefer different body regions for attachment?

YES

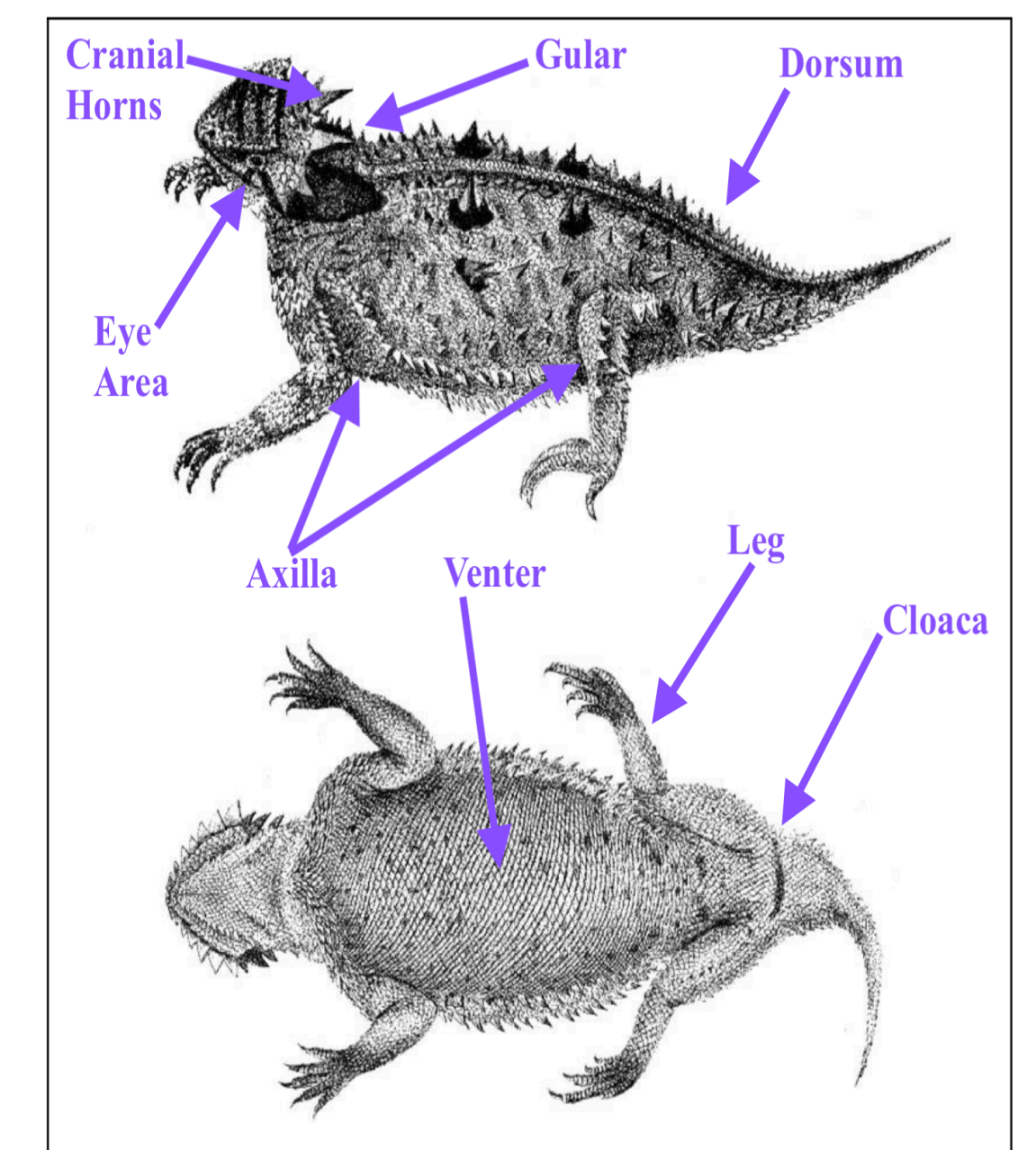
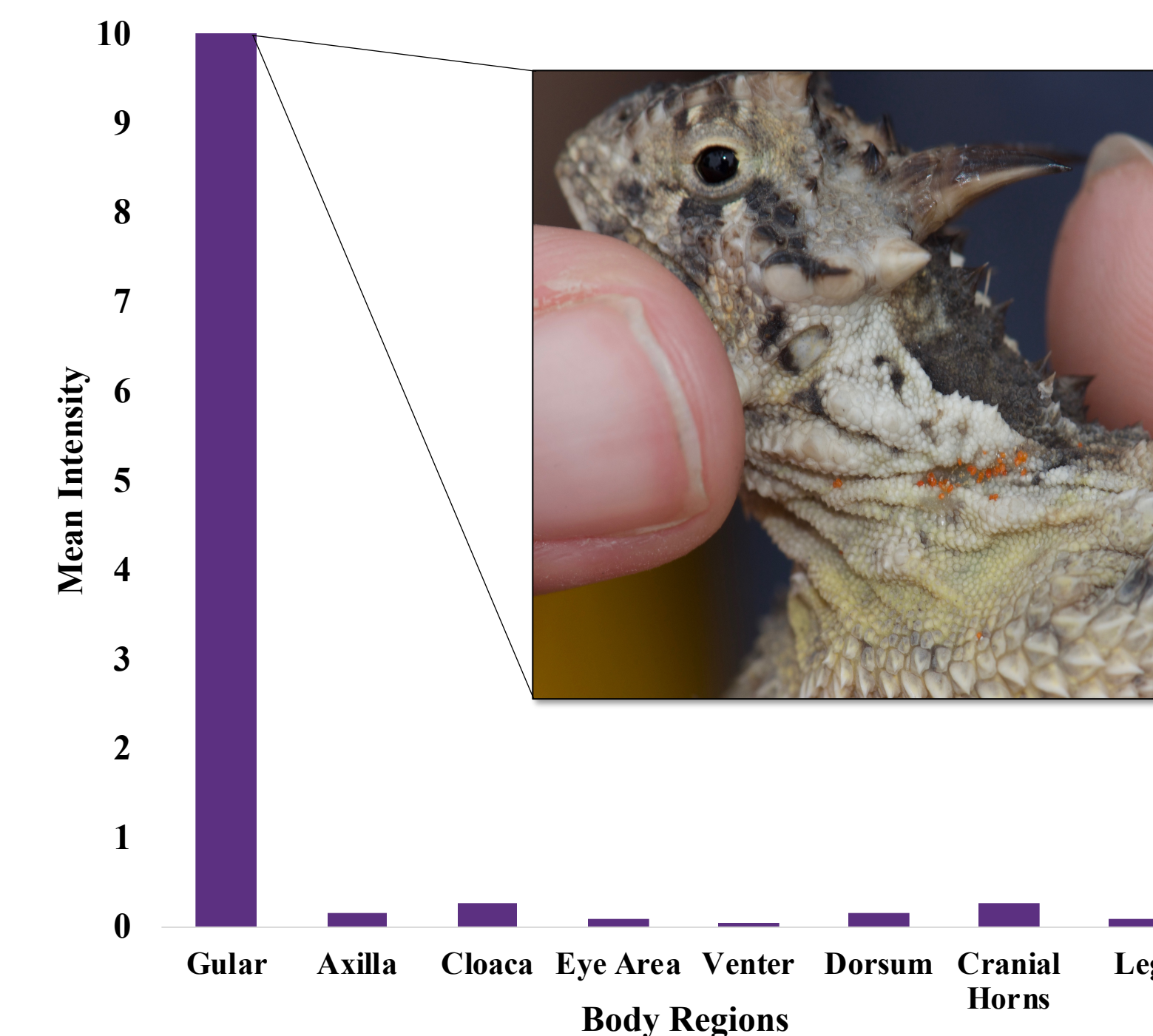


Figure 9. Mean intensity of ectoparasites by body regions and diagram of body regions on the Texas horned lizard.

- The body region where ectoparasites occurred with the highest mean intensity were the skin folds of the gular region (Fig. 9).
- The cranial horns and cloaca body regions were the second highest in ectoparasite mean intensity (Fig. 9).

## DISCUSSION

- Male-biased ectoparasite loads might be explained by increased testosterone levels in males during the breeding season.<sup>6</sup>
- Preliminary data suggest that Texas horned lizards living in rural environments could be less parasitized than those found in urban environments.
- Further studies needed to examine:
  - The effects of testosterone on ectoparasite load in Texas horned lizards.
  - If ectoparasite loads in rural environments are different than those found in urban environments.



## ACKNOWLEDGEMENTS

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