





































## Supplementary Figure Legends

**Supplementary Movie.** A rotating view of the 3D positions of male and female ecomorph densities shown in figure 2. The 3D object was plotted using `ks`<sup>32</sup> and `misc3D`<sup>33</sup> in the R statistical language<sup>34</sup>. We created a movie of the 3D object using the `rgl` package<sup>35</sup> to create a stack of pictures, and `imageJ`<sup>36</sup> to produce a movie from the stacked images.

**Supplementary figure 1.** The phylogenetic hypotheses used in the study. The species included in the study were a subset of the larger *Anolis* phylogeny<sup>37</sup>. The tree is ultrametric and branches are drawn proportionally to time, with the time depth from tip species to root equal to time=1.0.

**Supplementary figure 2.** Two dimensional graphs of morphospace overlap between ecomorph-sex classes. These graphs were constructed using 2D KDA<sup>32</sup> on can1, can2 (A) and separately on can2, can3 (B; see description for 3D analysis). Plotted are the inner 20% contours for the ecomorph-sex classes. Individual datapoints are overlaid on the color regions. crown-giant = green diamonds, grass-bush = yellow triangles, trunk-crown = red circles, trunk-ground= blue squares, twig = purple crossed boxes and asterisks. Females are depicted in lighter colors and open symbols, males are darker colors with filled symbols.

**Supplementary References:**

1. SAS Institute Inc. Version 9 of the SAS system for Unix. (2002-2003). SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.
2. Butler, M. A. & Losos, J. B. Multivariate sexual dimorphism, sexual selection, and adaptation in Greater Antillean *Anolis* lizards. *Ecological Monographs* 72, 541-559 (2002).
3. Floyd, H. B. & Jenssen, T. A. Food habits of the Jamaican lizard *Anolis opalinus*: Resource partitioning and seasonal effects examined. *Copeia* 1983, 319-331 (1983).
4. Preest, M. R. Sexual size dimorphism and feeding energetics in *Anolis carolinensis*: Why do females take smaller prey than males? *Journal of Herpetology* 28, 292-298 (1994).
5. Perry, G. The evolution of sexual dimorphism in the lizard *Anolis polylepsis* (Iguania): Evidence from intraspecific variation in foraging behavior and diet. *Canadian Journal of Zoology* 74, 1238-1245 (1996).
6. Parmelee, J. R. & Guyer, C. Sexual differences in foraging behavior of an anoline lizard, *Norops humilis*. *Journal of Herpetology* 29, 619-621 (1995).
7. Lister, B. C. Seasonal niche relationships of rain forest anoles. *Ecology* 62, 1548-1560 (1981).
8. Schoener, T. W. Ecological significance of sexual dimorphism in size in the lizard *Anolis conspersus*. *Science* 155, 474-476 (1967).
9. Schoener, T. W. *Anolis* lizards of Bimini: resource partitioning in a complex fauna. *Ecology* 49, 704-726 (1968).
10. Schoener, T. W. & Gorman, G. C. Some niche differences in three Lesser Antillean lizards of the genus *Anolis*. *Ecology* 49, 819-830 (1968).
11. Talbot, J. J. Time budget, niche overlap, inter- and intraspecific aggression in *Anolis humilis* and *Anolis limifrons* from Costa Rica. *Copeia* 1979, 472-481 (1979).
12. Collette, B. B. Correlations between ecology and morphology in anoline lizards from Havana, Cuba and southern Florida. *Bulletin of the Museum of Comparative Zoology* 125, 137-162 (1961).
13. Andrews, R. M. Structural habitat and time budget of a tropical *Anolis* lizard. *Ecology* 52, 262-271 (1971).
14. Lister, B. C. Nature of niche expansion in West-Indian *Anolis* lizards. 1. Ecological consequences of reduced competition. *Evolution* 30, 659-676 (1976).
15. Lister, B. C. & Aguayo, A. G. Seasonality, predation, and the behavior of a tropical mainland anole. *Journal of Animal Ecology* 61, 717-733 (1992).
16. Pounds, J. A. Ecomorphology, locomotion, and microhabitat structure: patterns in a tropical mainland *Anolis* community. *Ecological Monographs* 58, 299-320 (1988).
17. Powell, G. L. & Russell, A. P. Locomotor correlates of ecomorph designation in *Anolis*: an examination of three sympatric species from Jamaica. *Canadian Journal of Zoology* 70, 725-739 (1992).
18. Rand, A. S. & Rand, P. J. Field notes on *Anolis lineatus* in Curacao. *Studies on the Fauna of Curaçao and other Caribbean Islands* 24, 112-117 (1967).
19. Rand, A. S. Ecology and social organization in the iguanid lizard *Anolis lineatopus*. *Proceedings of the United States National Museum* 122, 1-79 (1967).
20. Rand, A. S. The ecological distribution of the anoline lizards around Kingston, Jamaica.

- Breviora* 272, 1-18 (1967).
21. Rodríguez Schettino, L. & Martínez Reyes, M. Algunos aspectos de la ecología trófica de *Anolis argenteolus* (Sauria: Polychridae) en una localidad de la Costa Suroriental de Cuba. *Biotropica* 28, 252-257 (1996).
  22. Schoener, T. W. & Schoener, A. Structural habitats of West Indian *Anolis* lizards. I. Lowland Jamaica. *Breviora* 368, 1-53 (1971).
  23. Schoener, T. W. & Schoener, A. Structural habitats of West Indian *Anolis* lizards. II. Puerto Rican uplands. *Breviora* 375, 1-39 (1971).
  24. Scott, N. J., Wilson, D. E., Jones, C. & Andrews, R. M. The choice of perch diameters by lizards of the genus *Anolis* (Reptilia, Lacertilia, Iguanidae). *Journal of Herpetology* 10, 75-84 (1976).
  25. Janssen, T. A. The ethoecology of *Anolis nebulosus* (Sauria, Iguanidae). *Journal of Herpetology* 4, 1-38 (1970).
  26. Irschick, D. J., Vanhooydonck, B., Herrel, A. & Meyers, J. Intraspecific correlations among morphology, performance and habitat use within a green anole lizard (*Anolis carolinensis*) population. *Biological Journal of the Linnean Society* 85, 211-221 (2005).
  27. Herrel, A., Joachim, R., Vanhooydonck, B. & Irschick D. Ecological consequences of ontogenetic changes in head shape and bite performance in the Jamaican lizard *Anolis lineatopus*. *Biological Journal of the Linnean Society* 89, 443-454 (2006).
  28. Losos, J. B. Ecomorphology, performance capability, and scaling of West-Indian *Anolis* lizards: an evolutionary analysis. *Ecological Monographs* 60, 369-388 (1990).
  29. Butler, M. A., Schoener, T. W. & Losos, J. B. The relationship between sexual size dimorphism and habitat use in Greater Antillean *Anolis* Lizards. *Evolution* 54, 259-272 (2000).
  30. Langerhans, R. B. & DeWitt, T. J. Shared and unique features of evolutionary diversification. *American Naturalist* 164, 335-349 (2004).
  31. Olejnik, S. & Algina, J. Measures of effect size for comparative studies: Applications, interpretations, and limitations. *Contemporary Educational Psychology* 25, 241-286 (2000).
  32. Duong, T. ks: Kernel smoothing, R package version 1.3.4. <http://web.maths.unsw.edu.au/~tduong>. (2005).
  33. Feng, D. & Tierney, L. misc3D: Miscellaneous 3D Plots, R package version 0.3-1. (2005).
  34. R Development Core Team. A language and environment for statistical computing, version 2.2.0. <http://www.R-project.org>. (R Foundation for Statistical Computing, Vienna, 2005).
  35. Adler, D. rgl: 3D visualization device system (OpenGL), R package version 0.65-2. <http://rgl.neoscientists.org>. (2005).
  36. Rasband, W. S. ImageJ, <http://rsb.info.nih.gov/ij/>. (U.S. National Institutes of Health, Bethesda, 1997-2005).
  37. Nicholson, K. E., Glor R. E., Kolbe, J. J., Larson A., Hedges, S. B. and Losos, J. B. Mainland colonization by island lizards. *Journal of Biogeography* 32, 929-938 (2005).