

Inferring predator identity from skeletal damage of small-mammal prey remains

Rebecca C. Terry*

*Department of Geophysical Sciences, University of Chicago,
5734 S. Ellis Avenue, Chicago, IL 60637, USA*

ABSTRACT

Questions: Do predator-derived small-mammal skeletal assemblages record statistically distinguishable predator-specific damage signatures? Can a given skeletal assemblage of unknown origin be correctly attributed to a specific predator based on skeletal damage? Has the type of predator responsible for creating the Holocene faunal sequence at Homestead Cave, Utah, remained constant over the depositional history of the record?

Data incorporated: Two data sets were compiled from published counts of small-mammal skeletal material recovered from modern scatological assemblages produced by a variety of predators from around the world. One data set contained skeletal part frequencies, whereas the other contained proportional fragmentation information. Skeletal part frequencies and proportional fragmentation data were also compiled for 15 strata spanning the Holocene from Homestead Cave, Utah.

Method of analysis: Principal components analysis and discriminant function analysis with cross-validation of predator classification success rates.

Conclusions: Modern small-mammal skeletal assemblages produced by owls are reliably differentiable from those produced by diurnal raptors and mammalian carnivores. Owl-produced assemblages are characterized by a low frequency of fragmentation and the survival of a high proportion of fragile skeletal specimens, whereas assemblages produced by diurnal raptors and mammalian carnivores exhibit increased bone destruction and a residual concentration of teeth. The ability to perform species-specific predator identifications is not supported, but skeletal damage patterns are extremely useful for identifying the general type of predator responsible for creating a skeletal concentration of unknown origin, with classification success rates of 70–100%. Finally, application of the method indicates that owl prey were the dominant source for skeletal material over the entire depositional history of the Holocene Homestead Cave record.

Keywords: Homestead Cave (Utah), discriminant function analysis, paleoecology, predation, principal components analysis, skeletal damage patterns, small mammals, taphonomy.

* e-mail: rcterry@uchicago.edu

Consult the copyright statement on the inside front cover for non-commercial copying policies.



www.evolutionary-ecology.com

***Evolutionary Ecology Research* is delighted that you wish to consult one of its articles.**

You may if your library or laboratory subscribes.

Ask your librarian or library committee why your place does not already subscribe to the low-cost journal that is publishing splendid science in a socially responsible manner. *EER*'s low prices have helped librarians to rein in the indefensible cost increases that have reduced our access to science all over the world! Just ask our partners at [SPARC](#) — the Scholarly Publishing & Academic Resources Coalition of the Association of Research Libraries.

Or maybe you should just remind the folks who order your journals to contact us and subscribe! You need — and they should support — the journal that:

- Invented the instant publication of reviewed, revised and accepted e-editions.
- Vests the copyrights of all articles in their authors while preserving the rights of educational and research groups to use its material in classes, seminars, etc. at no additional cost.
- Maintains a unified data-base of articles, thus doing away with your need to worry about issue numbers, author order, and other such impediments to easy access.
- Provides *Webglimpse* so that you can search any word, place, species, variable, phrase or author in any article *EER* has ever published.
- Pioneered e-only subscriptions while maintaining, at the same time, a traditional print edition, too.

Some 10,000 readers per week have it right. *EER* is the place to go for great science, responsible publication policies and easy access!

[Click here for the Table of Contents](#) of the most recent issue of *Evolutionary Ecology Research*

[Click here for full access to a sample issue](#) of *Evolutionary Ecology Research*

[Click here for SUBSCRIPTION INFORMATION](#)