ARPHA Conference Abstracts 1: e29878
doi: 10.3897/aca.1.e29878

Conference Abstract

Ecological and Evolutionary Classification of Subterranean Organisms

David C Culver‡, Tanja Pipan§

‡ The American University Dapartmemt of Biology, NW Washington DC, United States of America
§ Karst Research Institute, Postojna, Slovenia

Corresponding author: David C Culver (dculver@american.edu)

Received: 18 Sep 2018 | Published: 19 Sep 2018

Citation: Culver D, Pipan T (2018) Ecological and Evolutionary Classification of Subterranean Organisms . ARPHA Conference Abstracts 1: e29878. https://doi.org/10.3897/aca.1.e29878

Abstract

Evolutionary processes, including natural selection, neutral mutation, and habitat filtering, act upon morphology and other aspects of their biology, as well as species composition itself, to produce the observed patterns or community structure and morphology. The context for these evolutionary processes (the ecological theater in G.E. Hutchinson's phrase) are the subterranean habitats. We have a relatively rich vocabulary to describe habitats (e.g., MSS, epikarst, hypotelminorheic) and to describe the closeness of association of a particular species or population with these habitats (e.g. trogloxene, troglophile, and troglobiont). Trajano provides a bridging principle between the ecological theater and the evolutionary play with the concept of source and sink populations. What has been given much less attention is the morphological side, coined by Christiansen, that is the results of the evolutionary play. The word we have available is "troglomorphy", which has been taken to mean

1. loss of eyes and pigment,
2. loss of eyes and pigment as well as increases in extra-optic sensory structures,
3. any convergent change in any subterranean population.

Only regressive changes are included in the first meaning; both regressive and progressive changes are included in the second; and the third includes autamorphy as well as homoplasy. Typically, it is used for the suite of characters involved, rather than an individual

character. We suggest that the term “troglomorphy” be restricted to convergent changes (in the sense of [2] above) in subterranean habitats, and that the phrase “cave-dependent”, also used by Christiansen, be used when considering only caves, and perhaps be joined by phrases such as “MSS-dependent”. Additionally, the phrases ‘cave-dependent”, “MSS-dependent”, etc. be used for individual characters.

Keywords

stygobiont, troglobiont, troglomorph,

Presenting author

David C Culver