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GENERAL INFORMATION

Title of Dataset: Data Files for *Variation and Taphonomic Implications of Composition in Modern and Fossil Malacostracan Cuticles*

Author/Principal Investigator Information

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Date of data collection: 1987-1989

*Geographic location of data collection:*

Specimen collections: Bermuda, Georgia (U.S.A.), Lake Tanganyika, Burundi; South Dakota, Texas. Data analysis at Department of Geological Sciences, University of Illinois at Chicago (currently Department of Earth and Environmental Sciences).

*Funding sources that supported the collection of the data:*

Bermuda Biological Station for Research, the Whitehall Foundation, the Petroleum Research Fund of the American Chemical Society, the University of Illinois at Chicago, and the American Museum of Natural History

SHARING/ACCESS INFORMATION

Licenses/restrictions placed on the data:

CC0

Links to publications that cite or use the data:

*Variation and Taphonomic Implications of Composition in Modern and Fossil Malacostracan Cuticles* by Roy E. Plotnick and Steve McCarroll. Journal of Crustacean Biology. (in press).

Recommended citation for this dataset:

DATA & FILE OVERVIEW

Each data file has a name and/or an original file number. These are listed, along with the taxonomic data, in Supplemental File S4 of the paper, included here.

*Georgia:*

Armases cinereum.xlsx

Callinectes similis.xlsx

Clibanarius vittatus.xlsx

Eurypanopeus depressus.xlsx

Lepidopa websteri.xlsx

Menippe mercenaria.xlsx

Ocypode quadrata.xlsx

Pagurus pollicaris.xlsx

Panopeus herbstii.xlsx

Uca pugnax.xlsx

*Bermuda:*

Gecarcinus lateralis transects.pdf

Gecarcinus lateralis.xlsx

Lobopilumnus agassizii.xlsx

Lygia sp..xlsx

Mithraculus forceps.xlsx

Neogonodactylus bredini.xlsx

Neogonodactylus spinulosus.xlsx

Omalacantha bicornuta.xlsx

Pachygrapsus transversus.xlsx

Panopeus herbsti.xlsx

Panopeus occidentalis.xlsx

Panulirus guttatus.xlsx

Percnon gibbesi.xlsx

Petrolisthes armatus.xlsx

Platyactaea setigera.xlsx

Portunus depressifrons.xlsx

Williamstimpsonia denticulatus.xlsx

*Africa:*

African crab.xlsx

*Fossil and taphonomy*:

fossil data.xlsx

Taphonomy Study.xlsx

Data was originally on dot matrix computer printouts. These were typed into Excel spreadsheets by Erin Conley. Original hard copies of the summary data and the point-by-point analyses are stored in Roy Plotnick’s office in 2454 SES.

METHODOLOGICAL INFORMATION

This data set contains major element chemical analyses (Ca, Mg, Na, P) using SEM-EDS of modern crustacean exoskeletons from Bermuda, Georgia (U.S.A.), and Lake Tanganyika, Burundi and fossil specimens from Texas. Elemental compositions of these cuticles were determined utilizing a JEOL JSM-35CE Scanning Electron Microscope (JEOL, Tokyo, Japan) equipped with a Tracor Northern 5500 (Microscan Energy Dispersive Spectrometer (EDS) (Tracor Northern, Middleton, Wisconsin, USA), using Bence-Albee or ZAF quantitative methods.

The ZAF analyses reported by the probe software were elemental weight percents, whereas Bence-Albee (BA) analyses were reported as normalized oxide weight percents. For consistency, the oxide values were converted to elemental values. This was a two-step process:

1. The normalization of the oxide values needed to be reversed. This required locating the original data for the total percents for each data point. The normalized data could then be converted back to the “calculated weight” for the oxide. For example:
   1. Normalized weight percent CaO = 50.43%
   2. Total non-normalized weight percent all data = 85.06%
   3. Original calculated (non-normalized) percent CaO = 42.90%
2. The oxide percents could then be converted to element percent using the following conversion factors:
   1. Ca = CaO \*0.71469
   2. Mg = MgO \* 0.60311
   3. Na = Na2O \* 0.74186
   4. P = P2O5 \* 0.43642

ZAF: remainder of weight assumed to be oxygen

BA – remainder CO2 by stochiometry