AN INVENTORY OF PALEONTOLOGICAL RESOURCES FROM WALNUT CANYON NATIONAL MONUMENT, ARIZONA

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ABSTARCT -Walnut Canyon is carved into Permian sedimentary rocks on the southern margin of the Colorado Plateau in Arizona. The Coconino Sandstone and the Kaibab Limestone are well exposed fossiliferous units within Walnut Canyon. The canyon developed during the gradual uplift of the region, increasing stream downcutting. The ruins of approximately 300 rooms are preserved in the sedimentary cliffs within Walnut Canyon.

COCONINO SANDSTONE

The Coconino Sandstone is well exposed in Canyon National Monument Walnut cross-bedded, aeolian sandstone. This unit occurs throughout northern Arizona on the southern limits of the Colorado Plateau.

Low diversity vertebrate and invertebrate ichnofauna are reported from within the Coconino Sandstone, however, not specifically from Walnut Canyon National Monument. Lull (I 918) provides the first scientific description of Coconino tetrapods from Arizona. During the 1920s, Charles Gilmore produced a series of monographs on fossil vertebrate tracks from late Paleozoic strata in Grand Canyon National Park(Gilmore, 1926, 1927, 1928).

A revised ichnotaxonomy of Coconino vertebrate tracks was developed by McKeever and Haubold (1996). All Coconino tetrapod traces were identified within three ichnospecies of *Chelichnus. Chelichnus is* characterized by rounded manual and pedal impressions that are nearly equal in size and exhibit five short, rounded toe impressions. Trackways have a pace angularion of about 90 degrees and the manual and pedal impressions are close together (McKeever and Haubold, 1996). The three valid ichnospecies of *Chelichnus* are distinguished on the basis of size alone and are presumed to be the tracks of caseid-like reptiles.

KAIBAB LIMESTONE

The Kaibab Limestone overlies the Coconino Sandstone in Walnut Canyon. The Kaibab is a grey, sandy, marine limestone unit that forms the capping rock throughout the Colorado Plateau in north-central Arizona. The overhanging ledges formed at the base of the Kaibab Limestone were areas frequently utilized by the cliff dwellers of Walnut Canyon.

The Kalbah is very fossiliferous. The most comprehensive review of the Kaibab fauna was produced by McKee (I 938), who divided the formation into three members: Alpha (top), Beta (middle) and Gamma (lower). Hopkins (1990) more recently divided the Kaibab into two members. The Fossil Mountain Member equates to McKee's beta and

gamma members. The Harrisburg Dome Member equates to McKee's alpha member. Many dozens of marine invertebrate species have been reported from the Kaibab Limestone in Arizona. The assemblage of fossils from the Alpha member include pelecypods, gastropods and scaphopods. This assemblage indicates a shallow, near-shore, brackish, marine depositional environment.

Fossil sponges are often contained within silica concretions in the Kaibab. The brachiopods include productid and spiriferid species. Below is a composite list of paleontological resources from Walnut Canyon and the surrounding area.

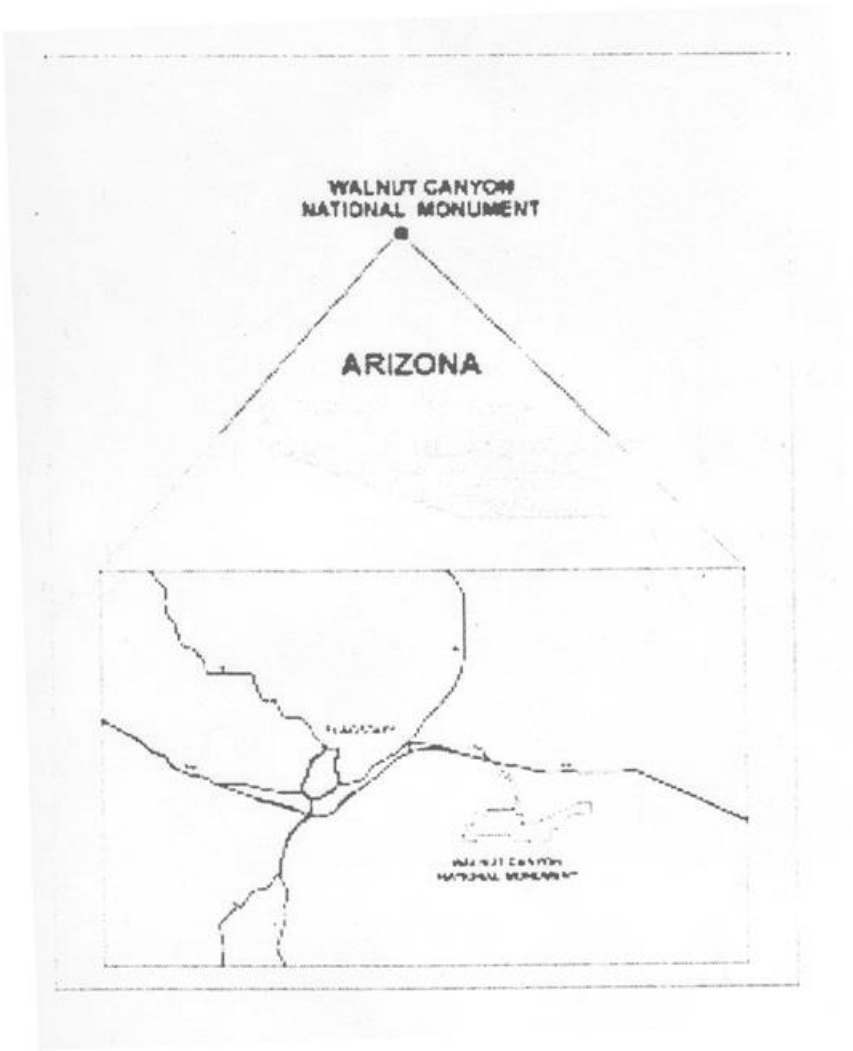


Figure 1. Map showing the geographic location of Walnut Canyon National Monument, Arizona.

PHYLUM BRYOZOA

Unidentified bryozoans are known only as fragmentary remains from the lower portion of the Alpha Member of the Kaibab Limestone.

PHYLUM MOLLUSCA

Class Gastropoda

- *Baylea* sp.
- *Bellerophon deflectus*
- *Euomphalus* sp.
- *Euphemites* sp.
- *Goniasma* sp.
- *Murchisonia* sp.
- *Naticopsis* sp.
- *Pennotrochus arizonensis*
- *Soleniscus* sp.
- *Busyconid gastropods*

Class Pelecypoda

- *Allorisma* sp.
- *Astarella* sp.
- *Aviculopecten kaibabensis*
- *Dozierella* sp.
- *Edmondia* sp.
- *Gramatodon politus*
- *Janeia* sp.
- *Kaibabella curvilinata*
- *Myalina* sp.
- *Myalinella adunca*
- *Nuculana* sp.
- *Nuculopsis* sp.
- *Palaeonucula levatiformis*
- *Parallelodon* sp.
- *Permophorous albequus*
- *Pleurophorus albequus*
- *Schizodus texanus*
- *Solemya* sp.
- *Solenomorpha* sp.

Class Scaphopoda

- *Plagioglypta canna*

Class Cephalopoda

- *Aulometacoceras* sp.
- *Metacoceras unklesbayi*
- *Stearoceras* sp.
- *Tainoceras* sp.

PHYLUM BRACH1OPODA

Chonetes sp.
Composita arizonica
Dictyoclostus sp.
Marginifera sp.
Peniculauris bassi
Quadrochonetes kaibabensis
Rugatia paraindica

PHYLUM ARTHROPODA

Class Trilobita
Anisopyge sp.
Ditomopyge sp.

PHYLUM ANNELIDA

Worm tubes have been identified on a specimen of the brachiopod *Marginifera.*

PHYLUM CHORDATA

A variety of shark's teeth are known from the Kaibab Limestone including: *Sandalodus, Deltodus, Symmorium, Petalodus, Orrodus* and phyllodont tooth plates.

PALEOECOLOGY

According to McKee (1938) the Alpha member of the Kaibab formation represents a regressive shallow marine facies. This member consists of dolomites, dolomitic sandstones and intraformational conglomerates. Nicol (1944) suggests that the pelecypod *Schizodus* indicates a shallow hypersaline environment within the Alpha member of the Kaibab Formation. The assemblage represents a near shore brackish environment which is supported by the absence of corals. Bryozoans are known only as fragmentary remains from the lower portion of the Alpha Member. The fossil assemblages also reflect a thanatocoenoses (a collection of dead organisms or parts of organisms that have accumulated after death - death assemblage). The Beta member (Nicol, 1944) includes sponges and echinoderms.

ACKNOWLEDGEMENTS

We would like to acknowledge the support of the staff at Walnut Canyon National Monument including Steve Mitchelson and Jeri DeYoung. Thanks to Tom Olson for reviewing this publication and to David Hays and Marikka Hughes for providing assistance with the locality map. Additional thanks to Deb Hill who provided assistance with research at the Museum of Northern Arizona.

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