

**A new theropod locality at the
Jurassic Recreation Red Beds,
Tucson Mountains, Arizona**

by

Mark J. Collins, B.Sc.*
2 Grange Abbey Dr.
Donaghmede, Dublin
Ireland

Arizona Geological Survey
Contributed Report CR-06-B

August 2006

Arizona Geological Survey
416 W. Congress, Suite #100
Tucson, Arizona 85701

www.azgs.az.gov

*e-mail: collinsmarko@hotmail.com

ABSTRACT

A 70% complete *Herrerasaurus*-like footprint was discovered and photographed at the foot of a hill in the Recreation Red Beds close to the Saguaro National Park visitor's center in Tucson. The footprint has been assigned the name of *Herrerasauripus ratkevichi*. This find is the first evidence of dinosaur activity in the Recreation Red Beds. The age of the Recreation Red Beds is uncertain, however a minimum age of 159 Ma has been inferentially assigned due to the presence of a small igneous intrusion of that age. The morphology of the imprint is indicative of *Herrerasaurus* or other similar sized theropod.

INTRODUCTION

Since no other record of dinosaur activity has been detected in the Recreation Red Beds, the footprint has been assigned the name of *Herrerasauripus ratkevichi*, meaning 'Herrerasaurus footprint' and after local paleontologist and co-discoverer Ron Ratkevich. The naming of trace fossils, ichnotaxonomy, is a parataxonomy as the names are not derived from known body fossils (Lockley et al., 1995). It is, however, impossible to truly know which animal created this footprint until exceptionally sound evidence is found linking the trace fossil to a particular animal. Indeed the same is true of all trace fossils.

STRATIGRAPHY

The Recreation Red Beds have not been comprehensively studied, therefore data is sparse, however the following data have been obtained. The Red Beds are composed of argillite, known locally as 'pipe stone' which is composed of mud and fine silt deposits, and includes siltstone and sandstone (Lipman, 1993). Unfortunately the Red Beds can only be inferentially dated, with the best constraint being an igneous unit that intruded the Red Beds and has an age of 159 Ma, which tells us that the strata are at least that old (Bikerman and Damon, 1966). The sediments that formed the Red Beds appear to have been a highly oxidizing substrate that were therefore destructive of biological matter, as no body fossils have yet been found in these strata.

A small group of hills composed of Recreation Red Beds is located west of the Arizona-Sonora Desert Museum in the northwest quarter of section 1, T. 14 S., R. 11 E. (Lipman, 1993). The footprint reported here was found near the middle of the exposed stratigraphic section of the Recreation Red Beds in these hills.

PALEONTOLOGY

The fossil consists of three toe imprints, however the anterior end of the foot and hallux are absent (Figure 1). The span of the three toes is 4.5 inches at its widest point, the length of the left toe is 2.25 inches, the right toe is 2 inches and the middle toe is 2.5 inches in length. This fossil was found loose amongst countless shards of rock, and was

temporarily removed and stained for photographic purposes. Claw imprints are clearly visible at the tips of the middle and left toes. This footprint occurs in association with small lizard tracks as well as fossil rain-drop indentations.

The size and structure of the footprint are morphologically consistent with that of *Herrerasaurus*, hence the naming of the footprint. However it must be noted that this does not necessarily mean that the creator of the footprint was *Herrerasaurus*. Firstly, the age of the footprint is uncertain with a minimum age of 159 Ma, which means that the print could have been produced anywhere between the late Jurassic right up to the Triassic (and possibly beyond?). Body fossils of *Herrerasaurus* have been found in northern Arizona from the late Triassic, which could point towards the producer of this footprint being either *Herrerasaurus* or an ancestor of *Herrerasaurus*. And secondly, it is possible that this footprint was left by an unknown, and therefore new species of theropod given the lack of body fossils from this ancient ecological niche.

ACKNOWLEDGEMENTS

The author would like to thank the following people: Ron Ratkevich for his invaluable input and information on local geology and paleontology, which greatly aided the writing of this paper, and Dr. David A. Kring for help with assigning an age to the Red Beds.

REFERENCES CITED

- Bikerman, M., and Damon, P.E., 1966, K-Ar chronology of the Tucson Mountains, Pima County, Arizona: Geological Society of America, v. 77, p. 1224-1234.
- Lipman, P.W., 1993, Geologic map of the Tucson Mountains caldera, southern Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-2205, 2 sheets, scale 1:24,000.
- Lockley, M. and Hunt, A.P. 1995, Dinosaur Tracks and other fossil footprints of the Western United States, Columbia University Press, NY, p. 16.

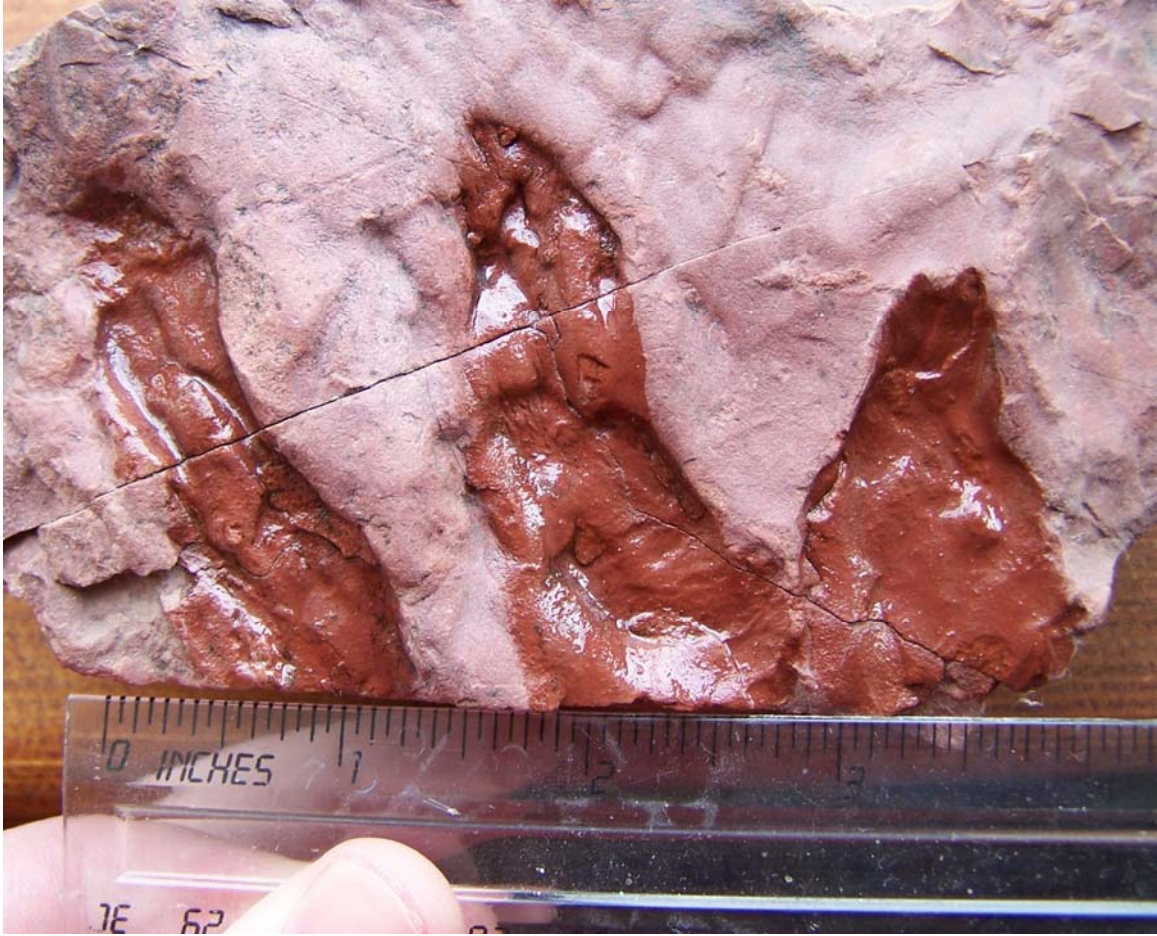


Figure 1. Photograph of theropod footprint.