HEMPHILLIAN RODENTS FROM NORTHERN OREGON AND THEIR BIOSTRATIGRAPHIC IMPLICATIONS

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ABSTRACT

Hemphillian localities south of the Columbia River in northern Oregon have produced thousands of small mammalian fossils. Castorids, geomyids, cricetids, and a murid described herein were derived from the Arlington, Ordnance, and McKay Reservoir localities. Large sample sizes allow a greater understanding of the range of variation and ontogenetic changes, as well as paleoecology and biostratigraphic distribution. Two new taxa are described, Parapliosaccomys wittei sp. nov., a geomyine, and Paronychomys woodburnei, a hypsodont cricetid. Castor, Dipoides, and Parapliosaccomys indicate the assemblages are late Hemphillian in age, although certain taxa indicate temporal differences among the localities. The lower Arlington and Ordnance localities are the oldest, Arlington 15 is medial, and McKay Reservoir is the youngest of the assemblages. A Castor-Parapliosaccomys Concurrent Range Biozone is named for the interval represented by the assemblages from northern Oregon and is correlated to Christmas Valley, OR, possibly Churchill Butte and Hoye Canyon, NV, as well as with assemblages from the Great Plains at Pliohippus Draw, ZX Bar, Mailbox, and Honey Creek, NE. The appearances of Prosomys and Spermophilus (Spermophilus) at the McKay Reservoir Locality provide another important datum indicating latest Hemphillian time.

INTRODUCTION

R.W. Wilson’s (1937b) review of Hemphillian rodents marked the culmination of investigations begun earlier in that century. Other than Shotwell’s (1956, 1970) works, largely concerned with paleoecology, small mammals from the Hemphillian of the Pacific Northwest have received relatively little attention. Our collections from northern Oregon (Figure 1) from Arlington, Ordnance, and McKay Reservoir produced very large samples that illustrate intraspecific variation and stratigraphic distribution.

Prior to this research, information of the biostratigraphic distribution of rodents in northern Oregon was limited. At many of the northern Oregon localities, good exposures, identifiable basalt flows, and the relative absence of channel deposits allowed recognition of vertical distribution of mammalian taxa. The abundant rodents were utilized to determine relative age differences in the Pacific Northwest, and their ranges allowed correlation with other Hemphillian rodent assemblages in North America.

This investigation includes lithostratigraphy, vertebrate paleontology, and correlation in Gilliam, Morrow, and Umatilla counties (Figure 1). The original Ordnance Locality (=Westend Blowout of University of Oregon) occurred in Morrow County about 16 km south of the Columbia River, formed in a 1.5 square kilometer aeolian blowout.

An assemblage from McKay Reservoir south of Pendleton, Umatilla County, was described (Shotwell, 1956), and we have collected for the past 25 years. These specimens increase morphological knowledge of known species, add new elements, and provide refinement of age and environment of deposition. The McKay specimens were found along the eastern shoreline from about 150 m of lateral exposure. Vertical distribution is somewhat limited, but fossils were found in situ from the upper 15 m of exposure.

The third area, south of Arlington, Gilliam County, consists of 12 localities (including the CIT Krebs Ranch localities). From 20 square kilometers, localities produced fossils with the greatest vertical distribution, illustrating biostratigraphic and environmental differences.

METHODS

To organize fossiliferous localities stratigraphically, geological correlations were made among localities. At Arlington, three distinct lithologies persist through the uppermost exposures where most specimens were found. Specimens were collected relative to distribution within discrete geological