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PLEISTOCENE MAMMALS FROM THE SOUTH SULPHUR RIVER, HUNT COUNTY, TEXAS

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ABSTRACT

Preliminary collecting and excavating along the South Sulphur River has produced a diverse list of fossil mammals. The pampathere, *Holmesina septentrionalis*, and the large armadillo, *Dasypus bellus*, with their southern affinities from the extinct megafauna, were found in association with *Microtus pennsylvanicus*, which has a northern distribution at present. This combination of species argues for climatic conditions and biotic communities during the Pleistocene that have no modern counterparts.

INTRODUCTION

One of us (LCD) has been collecting fossils along the South Sulphur River south and southwest of Commerce, Hunt County, Texas, since 1984. Although the focus was originally upon Cretaceous fish remains, several Pleistocene mammal fossils were collected through time. Efforts to measure the efficiency of collecting the bones and teeth have been reported (Ball and Davis, 1991).

The fossils are derived from Pleistocene and Recent sediments upon a Cretaceous bedrock of limestone or shale. Nothing has been noted to indicate the sediments differ in any major way from those described by Slaughter and Hoover (1963) from the North Sulphur River roughly 20 airline miles away to the northeast. As at the Ben Franklin quarries, river channelization has resulted in downcutting by 20 feet or more, freeing the fossils from their matrix. Gravel bars exposed during periods of low rainfall have been the chief source of the fossils reported in this study. In an attempt to deal only with Pleistocene materials, we have selected only those specimens which show some discoloration, particularly brown staining.

CHECKLIST OF FOSSIL MAMMALS OF THE SOUTH SULPHUR RIVER

Order Edentata
- *Holmesina septentrionalis*
- *Dasypus bellus*

Order Carnivora
- *Lynx rufus*
- *Taxidea taxus*

Order Rodentia
- *Castoroides ohioensis*
- *Castor canadensis*
- *Ondatra zibethicus*
- *Microtus pennsylvanicus*
- *Pitymys pinetorum* ?
- *Synaptomys cooperi*
- *Neotoma micropus* ?
- *Geomys bursarius*

Order Lagomorpha
- *Sylvilagus* sp.

Order Perissodactyla
- *Equus* sp.

Order Artiodactyla
- *Odocoileus virginianus*
- *Mylohyus nasutus*
- *Bison* sp.

Order Proboscidea
- *Mammuthus* sp.
- *Mammut americanum*

NOTES ON SPECIES

Holmesina septentrionalis

Referred specimens. One buckler osteoderm, one buckler or band osteoderm.

Discussion. This species is identified by the sculpturing around the perimeter of the external surface. One specimen, an irregular seven-sided polygon, is 8.7 mm thick and measures 44.1 mm by 39.9 mm. The other specimen tentatively assigned to this taxon is broken and abraded but appears to be the posterior part of an osteoderm from either the posterior row of the pectoral buckler (Fig. 7, Edmund, 1985) or the anterior row of a pelvic buckler (Fig. 8, Edmund, 1985).

The species has been recovered from 65 localities in the southeastern United States with Kanopolis, Kansas, being the northernmost record (Kurten and Anderson, 1980).

Dasypus bellus

Referred specimens. Seven buckler osteoderms, one band osteoderm.

Discussion. This species is recognizable by the characteristic sculpturing upon the armoring osteoderms. The band osteoderm is larger in width and thickness than the average of 194 osteoderms reported by Martin (Fig. 3.1, 1974). The buckler specimens have an average thickness of 4.8 mm.

This species ranged from Blackwater Draw, New Mexico (Harris, 1985) to Florida (Martin, 1974) and as far north as western Iowa (Rhodes, 1984). Its distribution was apparently limited by the availability of insects year round. Its presence indicates a climate no more severe than in north-central Texas today and a rainfall of more than 20 inches per year (Slaughter, 1961).

Lynx rufus

Referred specimens. Left ml.

Discussion. The specimen has a width of 5.0 mm (vs. 4.8 mm in a modern specimen from Newton County, Arkansas) and an anterior to posterior length of 11.1 mm (vs. 10.6 mm in the modern specimen). The length from the crown to the tip of the root measures 15.8 mm. The exposed enamel measures 6.2 mm vertically (vs. 5.8 mm in the modern specimen).

The bobcat is a common mammal in Pleistocene deposits, having been recovered in over 60 Rancholabrean sites from California to Florida, including Texas and Arkansas. The fossil record extends from the Blancan through the Recent.

The bobcat inhabits a wide range of environments, from desert to swamps. Rodents and rabbits make up a large percentage of its diet.

Taxidea taxus

Referred specimens. Olecranon process of the right ulna.

Discussion. The fossil bone and a Recent badger ulna differ only in the degree of development of muscle attachment ridges. The fossil ulna probably came from an older individual than the Recent speciman at hand.

This medium-sized carnivore prefers grasslands and a diet of rodents.

Castoroides ohioensis

Referred specimens. Enamel fragment from an incisor.

Discussion. The fragment measures 12.8 mm by 14.3 mm and has the

fluted pattern present on the anterolateral surface of *Castoroides ohioensis* incisors. Seven ridges are present within the 14.3 mm section of enamel. There are five flutes in a distance of one centimeter across the fossil specimen. This spacing of flutes matches that on a cast of a *Casteroides* incisor.

During the Pleistocene, the giant beaver was the largest rodent in North America. It inhabited lakes and ponds bordered by swamps. There is no evidence that it cut trees and built dams. Its diet consisted of swamp vegetation. Fossils of the giant beaver have been found from Alaska south to Florida and from Nebraska east (Kurten and Anderson, 1980).

Castor canadensis

Referred specimens. Seven molars, one incisor.

Discussion. Color variation of the molars range from white to a permineralized brown, the latter specimens being of presumably greater age. The average size of the seven molars is 20.9 mm in vertical length by 7.3 mm anterior to posterior length by 6.9 mm width. The beaver incisor is 27.8 mm (vertical length) by 7.3 mm (anterior to posterior length) by 5.4 mm (width).

The earliest record of *Castor canadensis* is late Blancan. Beavers are large aquatic herbivorous rodents that are abundant along the waterways of North America excluding southern Florida.

Ondatra ziebethicus

Referred specimens. Twelve molars.

Discussion. When the lengths and widths of three lower first molars are measured and plotted using the Nelson and Semken technique (Fig. 1, 1970), the molars suggest an age no older than Wisconsinan. However, if dentine tract heights alone are considered, two specimens seem to fit with the Illinoian distribution (Fig. 2).

Microtus pennsylvanicus

Referred specimens. Two right ml.

Discussion. The specimens display the characteristic five closed enamel triangles of the meadow vole with a sixth triangle that is nearly closed. The species has the largest range of any American *Microtus* but presently lives no closer to Hunt County, Texas, than northwest New Mexico or northern Missouri (Reich, 1981). Fossil specimens of *M. pennsylvanicus* have been recovered from Pleistocene sediments in Texas, Oklahoma, and Louisiana (Martin, 1968).

It prefers grasslands, particularly moist areas, but can also be found in woodlands (Burt and Grossenheider, 1964).

Pitymys pinetorum

Referred specimens. Left lower jaw with m1-m3, left ml.

Discussion. The isolated ml is a fragment that is interpreted as being an anterior trefoil with two confluent triangles. The jaw fragment is referred to this taxon on the basis of the tightness of closure of the fifth and sixth triangles from the anterior trefoil such as is seen in *Pitymys*. By comparison there is incomplete closure, allowing some dentine between the opposite plates of enamel, in *Microtus ochrogaster*. This distinction is not infallible, but *Pitymys* does live in Hunt County, Texas today. The closest places *M. ochrogaster* lives to the find site are central Oklahoma and southeast Texas.

The pine vole is characteristically found in forests or orchards.

Synaptomys cooperi

Referred specimens. Right M1.

Discussion. The specimen displays the deep enamel re-entrants, which pass from one side of the tooth to the other, characteristic of this genus. The tooth lacks the anterior loop but resembles the enamel pattern of a *S. cooperi* figured by Guilday *et al.* (Fig. 19, 1964). At 1.5 mm wide, it is slightly larger than their New Paris No. 4 material. They stated that *Synaptomys* exhibits a negative Bergmann's response, and their specimens correlated best with the small forms in eastern Canada. The more southerly Sulphur River form would be expected to be larger.

The southern bog lemming occupies low, damp bogs and meadows with heavy growth of vegetation. Those populations living in northeast Arkansas would be the closest to the find site.

Neotoma micropus ?

Referred specimens. Right m2, left M2, and one molar fragment.

Discussion. The genus *Neotoma* can be recognized by its rooted molars with thick enamel covering. The right m2 more closely resembles a specimen of *N. micropus* at hand than the molars of three *N. floridana* since it has an inflated rather than a compressed posterior loop, and the posterior border of its middle labial salient is perpendicular to the long axis of the tooth. The identity of the tooth remains uncertain since it has been compared with only a small number of modern specimens, but there seem to be no distinguishing features at all on the left M2.

The southern plains wood rat, *N. micropus*, lives in western Texas, Oklahoma, and most of New Mexico while the eastern wood rat, *M. floridana*, lives in Hunt County today.

Geomys bursarius

Referred specimens. Three upper left incisors, two upper right incisors, three upper premolars.

Discussion. The plains pocket gopher is identifiable by a small, shallow groove medial to a wider, deeper groove running the length of the upper incisors. The premolars of *Geomys* are recognized by a pair of squared enamel re-entrants that nearly bisect the tooth.

Geomys is a burrower and is seldom seen above ground. It prefers grasslands such as pastures, roadsides, and railroad rights-of-way (Burt and Grossenheider, 1964).

Sylvilagus sp.

Referred specimens. Two upper molars, one lower second premolar.

Discussion. The specimens can be matched for size and gross structure by teeth of *Sylvilagus floridanus*, but they have not been compared to other species of the genus, such as the swamp rabbit which also lives in the area of the find site. Both species prefer some brush in their habitat and can live in marshy or swampy areas.

Equus sp.

Referred specimens. Six molar fragments.

Discussion. The six fragments have lengths of 64 mm, 53 mm, 38 mm, 87 mm, 58.5 mm, 28.5 mm and display complex enamel foldings. They are referred to *Equus*, but no complete teeth were recovered from the study area, and no attempt is made to assign the fossils to any particular species.

Odocoileus virginianus

Referred specimens. Left m1, right m3, left p2, left P3.

Discussion. The specimens were identified by comparing them with the dentition of a modern *Odocoileus virginianus*.

The white-tailed deer is first found in late Blancan and continues in the stratigraphy to the present. This species is an inhabitant of woodlands, forest edges, and bottomlands. It forages on trees and shrubs, with acorns also being an important food source.

Mylohyus nasutus

Referred specimen. One molar.

Discussion. The specimen is nearly square with four cusps worn down to expose the dentine. All four roots, one of them broken, are preserved. In the absence of comparative material, no ettempt has been made to determine which molar is present. It is the belief of Kurten and Anderson (1980) that this is the only species of long-nosed peccary in the eastern and central United States in Rancholabrean times.

Bison sp.

Referred specimen. One large selenodont molar fragment.

Discussion. The tooth fragment, 34.0 mm length by 17.6 mm width, as preserved, is appreciably larger than the specimens assigned to the white-tailed deer. We are aware of the difficulty in separating *Bison* teeth from those of *Bos*, but the specimen shows the degree of staining characteristic of other Pleistocene specimens from the South Sulphur River.

Mammuthus sp.

Referred specimens. 28 chips of enamel.

Discussion. These fragments have enamel thicknesses in excess of two millimeters with a linear pattern of corrugations and lumps. Only one fragment preserves two parallel enamel plates, 4.4 millimeters apart, for a total maximum thickness of 7.1 mm.

The parallel plates of enamel perpendicular to the occlusal surface have been regarded as evidence that these animals were grazers.

Mammut americanum

Referred specimens. Two blocks of enamel.

Discussion. These fragments preserve the rounded cusp pattern of these browsing proboscidians, and the enamel is more than five millimeters thick.

DISCUSSION

Interpretation of the South Sulphur River (hereafter, S.S.R.) fossils is complicated by their not having been found in place, but their similarity to the Ben Franklin local fauna (Slaughter and Hoover, 1963) from 20 miles away on the North Sulphur River is unmistakable. The two faunas share 15 or 16 species. We also recovered *Sigmodon hispidus* teeth but did not include the specimens because they appeared too young. The *Holmesina pampathere*, badger, beaver, and bobcat of this paper were not recovered in the Ben Franklin fauna, and we did not recover the *Sorex cinereus*, *Blarina* sp., *Spermophilus franklini*, *Reithrodontomys* sp., *Canis latrans* or ?*Antilocapra americana* that Slaughter and Hoover obtained by removing and washing "several tons of matrix."

One line of evidence that the S.S.R. species were contemporaries is the fact that all the extant species include one region of northeastern Kansas and northwestern Missouri within their present distributions (share an area of sympatry). This area along the Missouri River valley is determined by the southern border of *Microtus pennsylvanicus* and the northern occurrence of *Neotoma* sp. The question as to the proper identity of the microtine m1 with three closed triangles is not, then, a critical factor in interpreting the fauna. An area of sympatry for all 10 forms except *Geomys* can be mapped in southwestern Ohio, and all species except *Pitymys* can be located in southwestern Colorado. Since all these areas are north of the find site, it might be argued that the faunal changes down to the present have been mostly the loss of megafauna species and the retreat of certain species northward. If this retreat has been due to intolerance for the hottest days of summer (Slaughter and Hoover, 1963), it would follow that summer temperatures in Hunt County were cooler at the time the remains of the S.S.R. species were being preserved.

The presence of *Sorex cinereus* in the Ben Franklin local fauna prevents any area of sympatry from being mapped. The southern limit of the distribution of the masked shrew does pass within one hundred miles of the Kansas-Missouri area of sympatry identified above. The presence of this shrew is a further indication of cooler summer temperatures. At the same time, the presence of *Dasypus bellus* in both collections and *Holmesina* in the S.S.R. collection suggests that winter temperatures were not exceedingly low if we can rely on the present distribution of armadillos as an index to their intolerance of frigid conditions.

SUMMARY

At least 19 species of mammals have been recovered from gravel bars of the South Sulphur River, and six are members of the extinct Pleistocene megafauna. The collection is similar to the Ben Franklin local fauna recovered 20 miles away on the North Sulphur River. The areas of sympatry for both faunas suggest a climate that was cooler when the fossils were being deposited than the present. The absence of extremely high summer daytime temperatures would have allowed micro-mammals that are presently northern-distributed to have occupied northeast Texas during the Late Pleistocene.

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