SHORT COMMUNICATION

THE FIRST FOSSIL RECORD OF BOROPHAGINE DOGS (MAMMALIA, CARNIVORA) FROM SOUTH CAROLINA, U.S.A.

Z. JACK TSENG*1 and JONATHAN H. GEISLER1,2Division of Paleontology, American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024, U.S.A.; tsengzhijie@gmail.com; 2Department of Anatomy, New York Institute of Technology College of Osteopathic Medicine, Northern Boulevard, Old Westbury, New York 11568, U.S.A., jgeisler@nyit.edu

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Borophagine canids are among the most commonly found fossil carnivores in Neogene deposits of North America. Fossil records of the 23 genera of this extinct subfamily of dogs range from the Orellan (~34 Ma) to Blancan (~2 Ma) North American Land Mammal Ages (NALMAs; Wang et al., 1999). This subfamily includes the largest known canid, Epicyon haydeni, which exhibited hyena-like craniodental capabilities for durophagy (Tseng and Wang, 2010). Borophagines were assumed to have been widespread throughout the contiguous 48 states and into both Canada and Mexico, but the most conspicuous gaps in the geographical record of this subfamily, and of other Neogene mammals in general, are along the Atlantic Coast. We describe the first occurrence of this canid subfamily in South Carolina, adding to the sparse record along the Atlantic Coast. The new specimen is assigned to Borophagus, the terminal genus of borophagines.

Prior to this study, borophagines have been found along the Atlantic Coast in Florida, Maryland, and North Carolina (Tedford and Hunter, 1984; Wang et al., 1999; Eshelman and Whitmore, 2008). Those occurrences are represented by highly fragmentary specimens except for those from Florida. Sixteen taxa of borophagines are known from 12 fossil localities in Florida, including five species of Borophagus: Borophagus pugnator (Mixson’s Bone Bed, Withlacoochee River 4A and 4X, early Hemphillian; Palmetto Fauna, late Hemphillian), B. orc (Withlacoochee River 4A, early Hemphillian), B. hilli and B. dudleyi (Palmetto Fauna, late Hemphillian), and B. diversidens (Santa Fe River 1 and North Port Charlotte, late Blanccan). Of these, B. orc and B. dudleyi are known only from Florida (Wang et al., 1999). The borophagine specimens from Maryland, assigned to ?Cynarctus marylandica, are a jaw fragment with first and second molars (USNM 15561) and a second fragment with a fourth premolar (USNM 299471; Wang et al., 1999). Borophagine material from North Carolina, collected from the Lee Creek Mine, has been identified as Borophagus cf. B. dudleyi and includes a left dentary of a juvenile (USNM 437475), a maxillary fragment (USNM 205029), and upper (USNM 214511) and lower (USNM 26311) first molars of adult individuals. In addition, a femoral fragment was identified as Borophagus cf. B. orc (USNM 206166; Eshelman and Whitmore, 2008). Taken together, these occurrences document a moderate diversity of borophagines throughout the current eastern deciduous forest region, in an area where Neogene mammal faunas are rare, in contrast to the low-lying, swampy regions of Florida (Tedford and Hunter, 1984; Eshelman and Whitmore, 2008).

MATERIALS AND METHODS
All measurements were taken with vernier calipers to the nearest 0.1 mm.

Anatomical Abbreviation—p4, fourth lower premolar.
Institutional Abbreviations—AMNH, American Museum of Natural History, New York; CMNH, Carnegie Museum of Natural History, Pittsburgh; FAM, Frick Mammal Collection of the American Museum of Natural History; HAFO, Hagerman Fossil Beds National Monument, Idaho; IGMI, Instituto de Geologia Museo, Universidad Nacional Autonoma de Mexico, Mexico; IMNH, Idaho Museum of Natural History, Idaho; KUP, Division of Vertebrate Paleontology, Museum of Natural History, University of Kansas, Lawrence; PPHM, Panhandle Plains Historical Museum, Canyon, Texas; UCMP, University of California Museum of Paleontology, Berkeley; UF, University of Florida, Gainesville; USNM, Nebraska State Museum, University of Nebraska, Lincoln; USNM, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

SYSTEMATIC PALEONTOLOGY
Class MAMMALIA Linnaeus, 1758
Order CARNIVORA Bowdich, 1821
Suborder CANIFORMIA Cretzoi, 1943
Family CANIDAE Fischer de Waldheim, 1817
Subfamily BOROPHAGINAE Simpson, 1945
Genus BOROPHAGUS Cope, 1892
BOROPHAGUS HILLI (Johnston, 1939)
BOROPHAGUS cf. B. HILLI
(Fig. 1, Table 1)

Referred Specimen—AMNH 144657, isolated lower left p4 with complete posterior root.

Locality and Age—Martin Marietta Orangeburg Quarry, just west of County Line Road in Orangeburg County, South Carolina. Approximate coordinates are 33°20'50" N, 80°15' W. This quarry is within a few miles of the better known Martin Marietta Berkeley Quarry, also known as the Cross Quarry, and has similar faunas and geology. In these quarries a prominent disconformity separates the Pliocene Raysor and Goose Creek Formations from the underlying Cross Member of the Tupelo Bay Formation (Ward et al., 1979; Campbell and Campbell, 1995; Geisler et al., 2005). The closest Miocene strata are more than 30 km to the southeast (Weems and Lewis, 2002), and so far no Miocene fossils have been reported in the lag at the base of

*Corresponding author.

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