

Vertebrate footprints and other invertebrate trace fossils from the Late Pleistocene Hamori Formation of Jeju Island, Korea

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Mammalian and avian footprints and diverse invertebrate trace fossils are abundantly occurred from the Late Pleistocene Hamori Formation which is mainly composed of tuffaceous pebbly sandstones, sandstones, and shales deposited in the shoreline environment. The mammalian footprints are mostly of tracks of artiodactyls and perissodactyls. Artiodactyl footprints recognized by characteristic paired hooves are the most abundant. They are 78 to 114 mm in length, and are characterized by impressions of circular outlines, large rounded hills, tapered and divergent digits and open v-shaped, small interdigital areas between the medial hoof (III) and the lateral hoof (IV). These numerous tracks commonly associated with severely turbated structures probably made by deer trampling, herein called deer turbation, suggest that several deer herd walked on the shoreline environment. Perissodactyl footprints are not commonly occurred. They are 80 mm long and 80 mm wide in average. They are characterized by big rounded and circular hooves with V-shaped frog mark near the back of hoof. They are thought to be made by horses. Nearly circular shaped tracks with large size, about 25 cm in diameter, are probably attributed to small elephants are also observed. Avian footprints are also abundant and very diverse. Eight types of avian footprints are recognized on the basis of size, length/width ratio, interdigital angles, curvature of digit II and IV, presence of webs and hallix. These suggest that diverse birds including herons, ducks, and many kinds of wading shoreline birds, walked on the shoreline environment for fishing or hunting. Abundant invertebrate trace fossils recognized from the study area are Arenicolites, Cochlichnus, Diplocraterion, Helminthopsis, Planolites, Siskemia, Skolitos, Stiallia, Taenidium, and Thalassinoides. In addition, body fossils including crabs, gastropods, bivalves, and plants (*Magnolia* sp.) are occurred from the mudstones and the fine-grained

sandstones. All of these fossils reflect part of the wide diversity of population including mammals, birds, arthropods, molluscs, and plants present in Jeju Island during the Late Pleistocene (Paleolithic) Epoch.

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