

Fossil-bearing deposits from the Bukpyeong Formation (Miocene) in the Bukpyeong Basin at Donghae city, Gangwon-do, South Korea: occurrences, taphonomy and paleoenvironmental implications

Hyun Joo Kim (1), Eun Kyoung Jeong (2,3), Kazuhiko Uemura (4), Kyungsik Kim (3), and In Sung Paik (1)

(1) Department of Earth and Environmental Sciences, Pukyong National University, Busan, Korea(sunstay@pknu.ac.kr), (2) Institute for Biodiversity Research, Chonbuk National University, Jeonju, Korea, (3) Department of Biological Sciences, Chonbuk National University, Jeonju, Korea, (4) Department of Geology and Paleontology, National Museum of Nature and Science, Tsukuba, Japan

Abundant and diverse plant fossils such as land plants and subaqueous plants, freshwater mollusc fossils and invertebrate trace fossils are found in the Miocene Bukpyeong Formation at Donghae city, Gangwon-do, South Korea. Occurrences and taphofacies of the fossil-bearing deposits from the Bukpyeong Formation are described and their taphonomy and paleoenvironmental implications are interpreted. Based on fossil occurrences, lithofacies and sedimentary features of the fossil-bearing deposits, eight taphofacies are classified as the following: (1) Taphofacies 1: Gastropod fossils in massive silty mudstone; (2) Taphofacies 2: Bivalve fossils in massive silty mudstone; (3) Taphofacies 3: Plant fossils (leaf fossils) in massive silty mudstone; (4) Taphofacies 4: Gastropod and plant fossils in massive silty mudstone; (5) Taphofacies 5: Plant fossils in weakly fissile silty mudstone; (6) Taphofacies 6: Plant fossils (leaf fossils) in thin-bedded and graded silty mudstone to mudstone (claystone); (7) Taphofacies 7: Plant fragment fossils in thin-bedded and graded silty mudstone to mudstone (claystone); (8) Taphofacies 8: Plant debris in planar- to cross-laminated fine-grained sandstone. Taphonomy of taphofacies 1, 2, and 4 including freshwater mollusc fossils is interpreted to have been reworked or transported by turbidity currents after death and deposited in shallow lake to open lake. Taphonomy of taphofacies 3, 5, 6, and 7 including plant fossils is interpreted to have been transported by input of episodic flooding in the land and deposited by settling down in open lake. Taphofacies 8 including plant debris has been deposited in shallow lake by input of intensive episodic flooding from the land. The occurrences and taphofacies of the fossil-bearing deposits indicate that most of the fossils were transported by turbidity current induced by input of episodic flooding in the land and deposited in shallow lake to open lake. Moreover, plant fossils from the Bukpyeong Formation imply that the Miocene Bukpyeong lacustrine depositional environment was a terrestrial ecosystem under warm-temperate climate.