Journal of Vertebrate Paleontology 22(3):716–718, September 2002

NOTE

RICH DINOSAUR NESTING SITE FROM THE CRETACEOUS OF BOSUNG COUNTY, CHULLANAM-DO PROVINCE, SOUTH KOREA

MIN HUH[1] and DARLA K. ZELENITSKY[2], [1]Faculty of Earth Systems and Environmental Sciences and Dinosaur Research Center, Chonnam National University, Kwangju 500-575 Korea; [2]Department of Geology and Geophysics, University of Calgary, Calgary, Alberta, T2N 1N4, Canada, zelenits@geo.ucalgary.ca

The first discoveries of dinosaur remains in Asia occurred in China and Mongolia in the 1910s and 1920s (Andrews, 1932; Riabinin, 1925). These early discoveries included skeletal remains from both countries, as well as egg clutches from the latter. The first fossil vertebrate remains discovered in Korea were dinosaur eggshell fragments found in 1972 in the southeastern Korean province of South Gyeongsang (Yun and Yang, 1997). Since that time, more than 40 dinosaur and other vertebrate fossil sites have been located in this country, although only a few have been described in the literature. Track sites comprise the majority of fossil localities (Yang, 1982; Lim et al., 1989; Huh et al., 1996, 1997; Lockley et al., 1997; Baek and Seo, 1998); skeletal material has been found at only a few sites (Lee et al., 1997; Paik et al., 1998).

The first dinosaur egg locality in Korea that yielded clutches with complete eggs was found in 1999. This site is located in Bosung County in the southwestern province of Chullanam-do and stretches three kilometers along the south coast of the Korean peninsula (Fig. 1). The rocks exposed at the Bosung site are referred to the Seonso Conglomerate and are Cretaceous in age; further refinement of the age of these rocks is currently in progress. Eggs are found in four main areas of this site and occur within at least five different stratigraphic levels. The strata consist of alternating sandstones and mudstones, which represent channel and floodplain deposits respectively, with the majority of the eggs associated with calcareous paleosols. The egg remains include egg clutches, isolated eggs, and isolated shell fragments. The specimens are found in situ in outcrop, in blocks detached from the cliff face, and within unconsolidated beach deposits. To date, five groups of eggs have been excavated from the site, and approximately 10 clutches are currently exposed in outcrop. The Bosung site represents a rich and diverse nesting area, containing at least three different egg species, possibly belonging to sauropods, ornithopods, and turtles. This paper is intended as a preliminary report of the egg fossils found at the Bosung site.

Institutional Abbreviation—**DRCC**, Dinosaur Research Centre, Chonnam National University, Kwangju, South Korea.

SYSTEMATIC PALEONTOLOGY

OOFAMILY SPHEROOLITHIDAE Zhao and Li, 1988
OOGENUS *SPHEROOLITHUS* Zhao and Li, 1988
SPHEROOLITHUS sp.

Material—DRCC-B101, partial egg clutch; DRCC-B106, partial egg clutch; DRCC-B108, DRCC-B103, isolated eggs.

Locality—Sites 2, 3, and 4, Bosung County, Chullanam-do Province, South Korea.

Description—The eggs in both clutches are well-preserved and several have maintained their spherical shape. One clutch (DRCC-B106) contains four complete and four partial eggs; these eggs appear to be unhatched (Fig. 2A). A second clutch (DRCC-B101) consists of six to eight eggs with their upper portions eroded. The eggs are tightly grouped in both clutches and occur randomly in a single layer. A vertical separation of 10–30 mm is visible among adjacent eggs in DRCC-B106.

Well-preserved eggs range from 75–84 mm (n = 5) in diameter. The eggshell has a smooth outer surface and ranges in thickness from 1.83–2.52 mm (n = 25). Examination of five thin sections indicates that the shell units are columnar to fan-shaped and tightly abutting (Fig. 2B). The units display a sweeping extinction pattern typical of the spherulitic morphotype. These eggs are similar in form and structure to spheroolithids described from Mongolia (Mikhailov, 1994) and China (Zhao and Jiang, 1974).

FAVEOLOOLITHIDAE Zhao and Ding, 1976
FAVEOLOOLITHUS Zhao and Ding, 1976
FAVEOLOOLITHUS sp.

Material—DRCC-B110, partial egg clutch; DRCC-B105, two eggs; DRCC-B104, isolated egg.

Locality—Sites 1, 2, 4; Bosung County, Chullanam-do Province, South Korea.

Description—A partial clutch (DRCC-B110) was collected from a block detached from the cliff face. This clutch contains six compressed eggs, three of which are complete and three are partial (Fig. 2C). Eggs within the clutch occur randomly in a single layer. The central portions of the upper halves of the eggs are missing, indicating that the eggs hatched prior to burial.

The crushed eggs range from 150–200 mm in diameter. The eggshell has a smooth outer surface and ranges in thickness from 1.33–2.10 mm (n = 22). Examination of six thin sections indicates that the eggshell is somewhat recrystallized. In some thin sections, individual shell units are visible and contain pore canals (Fig. 2D). Pore canals are numerous, branching, and filled will secondary calcite. The porosity of the eggshell is high (25–30%), which is indicative of underground incubation. This porosity, however, may have been augmented somewhat by diagenesis. The egg morphology and eggshell structure are like those of faveoloolithid eggs from China (Zhao and Ding, 1976) and Mongolia (Mikhailov, 1994). Faveoloolithid eggs from Mongolia have been attributed

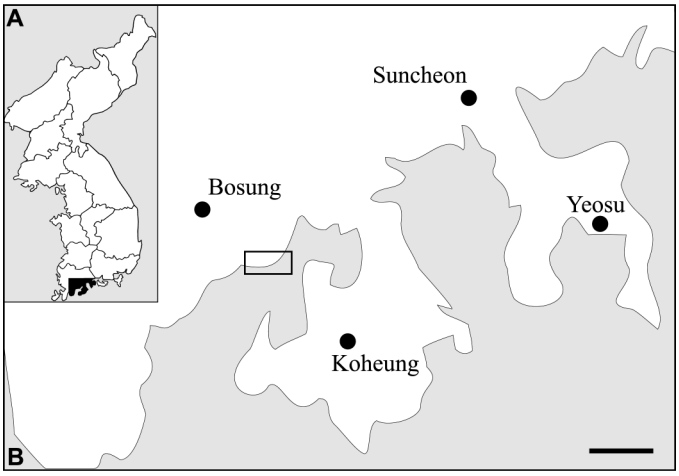

FIGURE 1. **A**, map of Korea showing general location (shaded region) of Bosung County site in Chullanam-do Province, Korea. **B**, Detailed map of shaded area from 'A' with location (rectangle) of egg site. Scale bar equals 10 km.