Dinosaur track-bearing deposits of the Cretaceous Gyeongsang Supergroup, Korea: Stratigraphic occurrences and paleoecological implications

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Abstract:

Dinosaur track-bearing deposits are common in the Cretaceous Gyeongsang Supergroup (Hauteri-vian to Maastrichtian) (Fig. 1), Korea. The Gyeongsang Supergroup consists of alluvial fan, fluvial plain, and lacustrine deposits and is composed of a variety of siliciclastic and tuffaceous rocks, some carbonates and evaporites. The dinosaur track-bearing deposits of the Gyeongsang Supergroup show variation in stratigraphic occurrences. Whereas dinosaur bone fossils occur in the lowermost Nakdong Formation (alluvial fan with some ponds) and are common in the overlying Hasandong Formation (fluvial with some lakes), dinosaur tracks are absent in the Nakdong Formation and scarcely present in the Hasandong Formation. Body fossils of dinosaurs are very rare throughout the Gyeongsang Supergroup except the Hasandong Formation, however, dinosaur tracks are common in the upper part of the Jinju Formation (lacustrine), the Haman Formation (alluvial plain with some ponds) and the Jindong Formation (alluvial plain and playa lakes). It is unusual that dinosaur tracks are absent in the Chilgok Formation overlying the Jinju Formation in spite of its similar depositional setting to that of the Haman Foramtion. In the pyroclastic deposit-dominated Yucheon Group (the uppermost Group) overlying the Jindong Formation dinosaur tracks are very rare. In summary the occurrences of dinosaur tracks in the Gyeongsang Supergroup shows the recurrent pattern of increase and decrease in abundance and a preferred occurrence in lake-related deposits rather than in alluvial fan and fluvial sediments. It is suggested that dinosaurs migrated into the Gyeongsang Basin during the Barremian, then thrived during Aptian to Cenomanian, and finally declined in the Campanian. The stratigraphic shifts of dinosaur occurrences might have been resulted from paleoenvironmental changes of the Gyeongsang Basin related to the evolution of regional tectonism inducing volcanic activity and paleoclimate changes on the Korean Peninsula during the Cretaceous.

Keywords: Cretaceous, dinosaurs, track deposits, paleoenvironments, Korea

References

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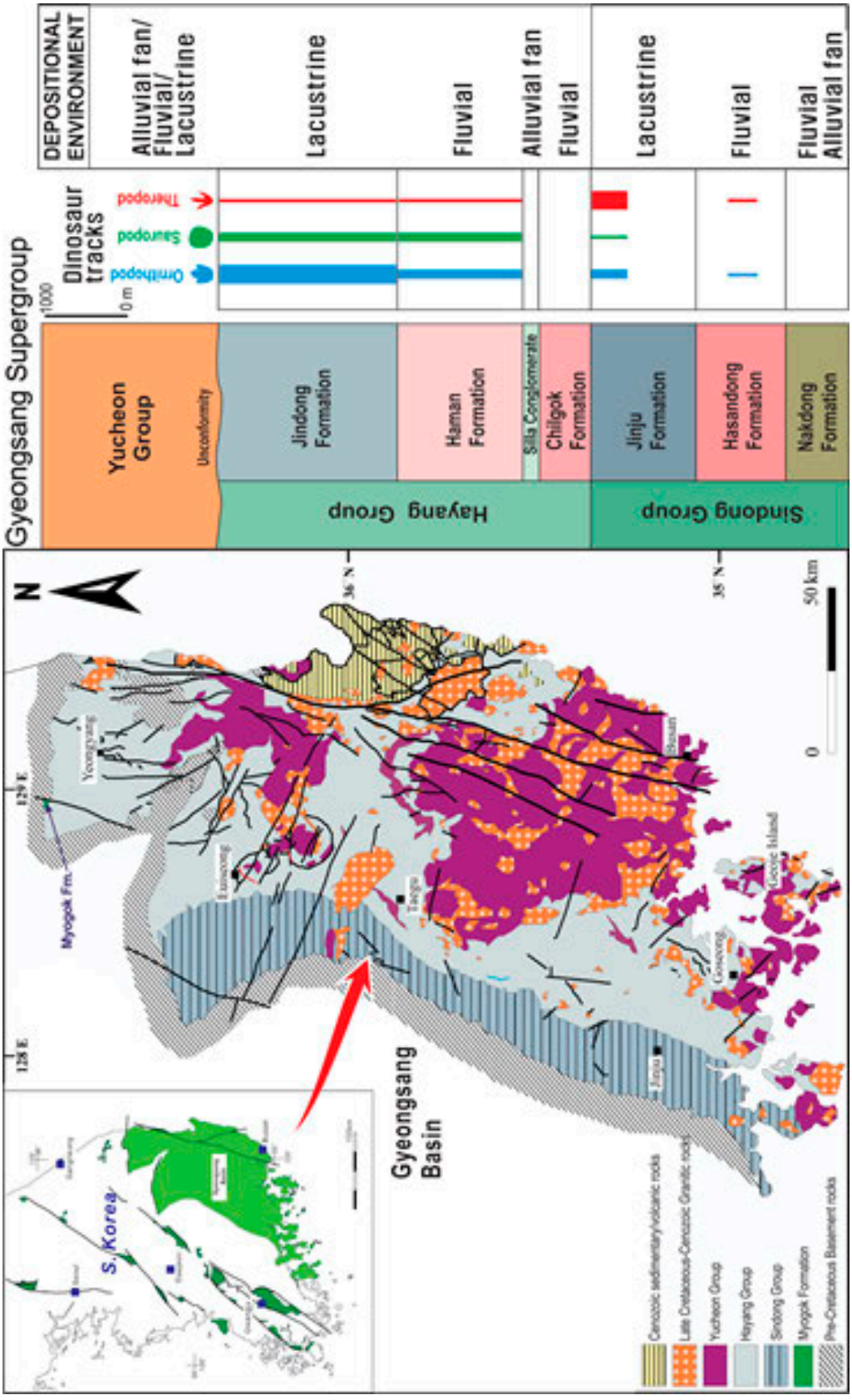

Fig. 1. Geological map of the Gyeongsang Basin (modified after KANG et al., 1995) and stratigraphic occurrences of the dinosaur tracks in the Gyeongsang Supergroup.