

Ar-Ar and SHRIMP U-Pb age evidence of the Daohugou fossil-bearing beds in Ningcheng, Inner Mongolia, NE China

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A new set of fossil-bearing beds, Daohugou fossil-bearing beds, was found in Daohugou area, Ningcheng, Inner Mongolia, NE China. This Biota is the key of researching the Yanliao Biota's extinction and the origin of the Jehol Biota. Before, there exist two representative opinions on the age of the Daohugou fossil-bearing beds. Some specialists suggest that it should belong to the Middle Jurassic and others believe that it should belong to the early Cretaceous. Their difference on the age is over 30 million years but both of them did not provide accurate isotope geochronological data. We dated the trachyte and trachytic welded tuff structurally overlying the Daohugou fossil-bearing beds using Ar-Ar and SHRIMP U-Pb method.

The plateau age of the sanidine from the trachytic welded tuff is 164.2 ± 2.5 Ma and the mean $^{206}\text{Pb}/^{238}\text{U}$ age of the zircon from the same sample is 164.6 ± 2.4 Ma. The mean $^{206}\text{Pb}/^{238}\text{U}$ age of the zircon from the trachyte is 165.2 ± 1.8 Ma. Based on these data, we can draw the following conclusions: (1) the age of the intermediate-acid volcanic rocks overlying the Daohugou fossil-bearing beds is about 164-165 Ma; and (2) the age of this fossil-bearing beds is over or equal to 165 Ma. Therefore we suggest that the age of Daohugou Biota is tens of millions years earlier than that of the Jehol Biota and it should belong to the Yanliao Biota or belong to the Biota between the Yanliao and Jehol Biota.

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