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MARINE OSTRACODS FOUND IN LACUSTRINE DEPOSITS OF THE QAIDAM BASIN SUGGESTS LONG-DISTANCE DISPERSAL DURING PLEISTOCENE

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Introduction

A large number of studies have focused on the long-distance dispersal of freshwater ostracod species (e.g. Horne and Smith, 2004). In contrast, the long-distance dispersal of brackish to marine ostracods (intercontinental, intraoceanic, and interoceanic transports) has been minimally explored by a few authors, discussing potential passive dispersal through rafting seaweeds, anthropogenic activities (global shipping, mariculture), shellfish (oysters), and even tsunamis (e.g. Tanaka et al., 2018).

Fig. 1 Location map of the Qaidam Basin and the sample position (red star)

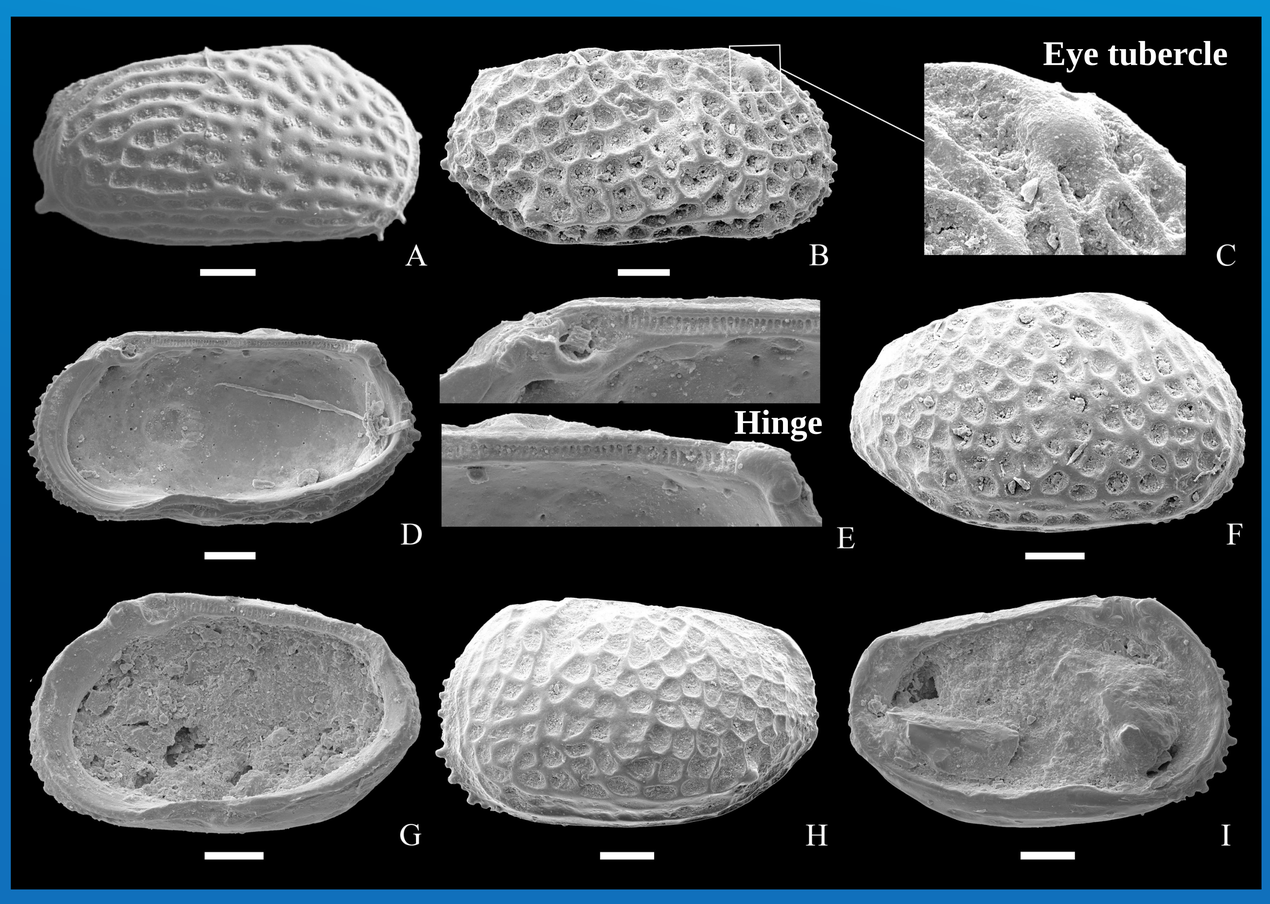

Fig. 2 Marine ostracods from the Pleistocene lacustrine deposits of the Qaidam Basin, A, *Bicornucythere bisanensis* s.l.; B-I, *Pistocythereis bradyformis;* Scale bar is 100 μm

Marine ostracods from lacustrine deposits in the Qaidam basin

Four ostracod specimens from the Pleistocene lacustrine deposits of the Qaidam Basin are re-assigned to the brackish to marine species B. *bisanensis* s.l. and *P. bradyformis* (Fig. 2), previously misclassified under the freshwater ostracod genus *Cytherissa* by Yang et al. (2020). These two marine ostracod species are benthic forms found in modern mud to fine-grained sand substrates along the coasts of China, Japan, Korea, Russia, and Vietnam, within latitudes approximately 20° N to 43° N, with fossil records concentrated along the Eastern Pacific Ocean coast.

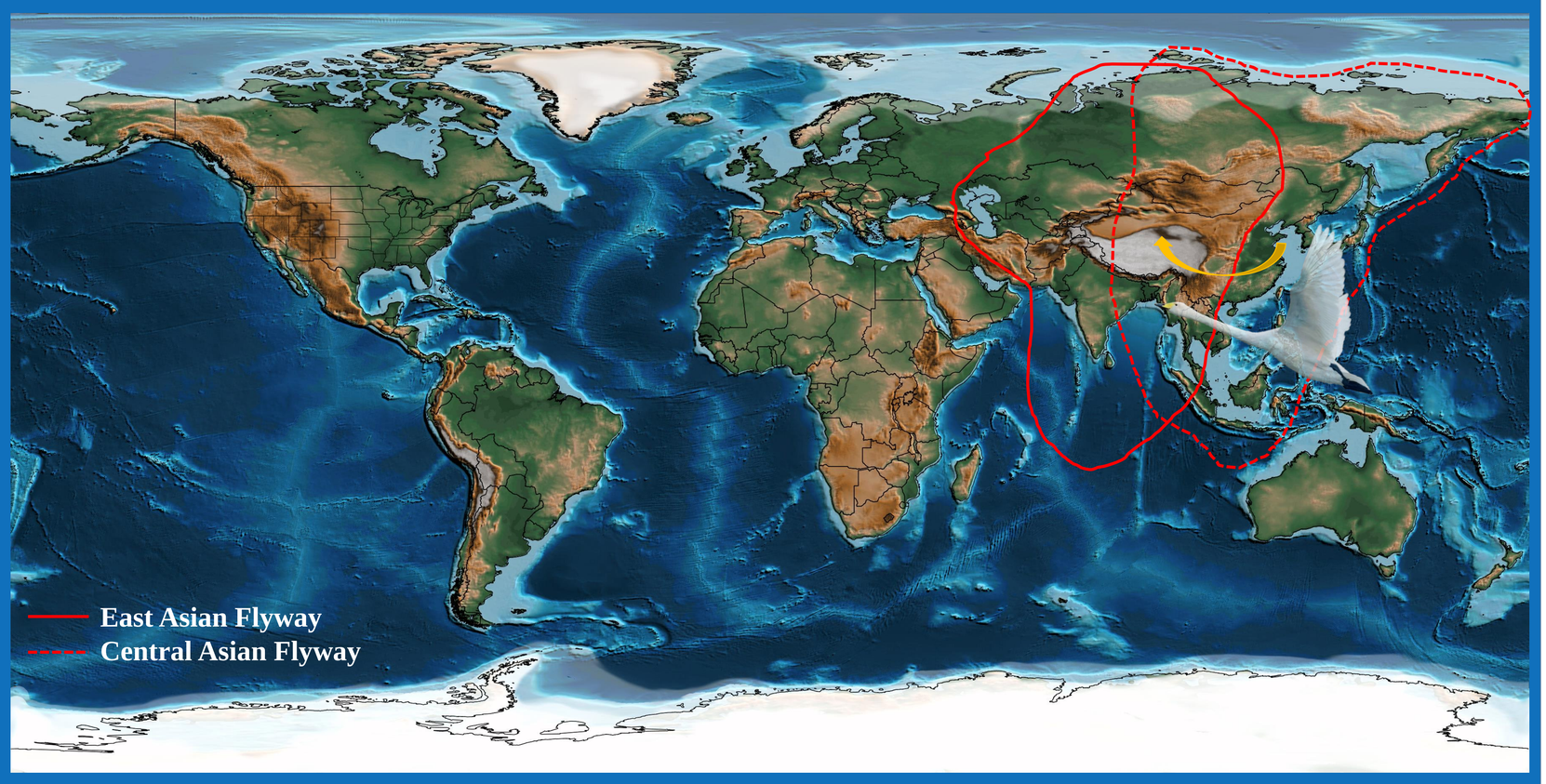

Fig. 3 Long distance dispersal of marine ostracods from Eastern Pacific Ocean coast to Qaidam palaeo-lake

Long distance dispersal of marine ostracods

- The Qaidam Basin, a terrestrial sedimentary basin since the Early Jurassic; and absence of a direct hydrological connection between the Qaidam palaeo-lake and the Eastern Pacific Ocean coastal areas.
- Certain microscopic marine organisms have successfully dispersed over long distances facilitated by vectors, including wind, water currents, sea plants, animals, and anthropogenic activities.
- Wind dispersal may be relatively inefficient over longer distances, water currents, fish, mollusks, and floating algae are potential agents facilitating passive migration of marine ostracods between interconnected habitats.
- Bird-mediated transport emerges as one of the most effective forms of passive dispersal for ostracods, especially over long distances and between disconnected habitats.

Conclusions

This study presents potential evidence for the long-distance dispersal of marine ostracods via water birds from the west coast area of the Pacific Ocean to the Qaidam palaeo-lake during the Pleistocene. It is also implied that the existence or formation of the East Asian Flyway or East Asia/Australasia Flyway during the Pleistocene period (Fig. 3).

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