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## **ABSTRACT BOOK**

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## Insect fauna and environment during the last interglacial in Western Beringia

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The Holocene warming played a significant role in mammoth extinction. Previous warm periods could provide important information that helps to understand mammoth population response for the environment changes. The last interglacial (Marine Isotope Stage 5e) is the best model. It was the period of earth history in which climate was comparable to or warmer than today. Last interglacial (LI) fossil insect assemblages have been studied from number of sites across Beringia. In Eastern Beringia the LI insect assemblages contain forest taxa, and an unusual presence of xerophilous insects such as the thermophilous steppe beetle *Connatichela artemisiae* (Kuzmina et al, 2009, 2014). Some species (*Kalissus nitidus* from Old Crow site in northern Yukon or *Cryptopleurum vagans* from Thistle Creek site in central Yukon) indicate warmer than recent climate.

In Western Beringia the LI insect assemblages are known only from a restricted number of sites, but the record provides indispensable information. Insect faunas were studied from two different regions: the Kolyma Lowland: Alazea, Molotkovsky Kamen' and the Laptev Strait area: Bolshoy Lyakhovsky, Oyagoss (Andreev et al, 2004, Kienast et al, 2011, Kuzmina, 1989). Similar to East Beringia, the LI insect assemblages from West Beringia contain some forest species in combination with xerophilous insects. The reconstructed environment is different, due to geographic position.

Insect assemblages from the Kolyma Lowland sites yield some thermophilous taxa (*Diacheila polita*, *Agonum quinquepunctatum*, *A. fuliginosum*, *Colymbetes dolabratus*, *Hydrobius fuscipes*, *Cyrtoplastus irregularis*, *Leiodes* sp., *Quedius* sp., *Corticaria* sp., *Phaedon concinnus*, *Phratora polaris*, *Luperus* sp., *Bromius obscurus*, *Notaris bimaculatus*, *Formica* sp.) which indicate forest-tundra environment, and also a couple of typical steppe-tundra species (*Morychus viridis*, *Troglocollops arcticus*). The steppe-tundra indicators decreased their number significantly in the LI time, but did not disappear completely. There is no evidence of warmer than present climate.

Another situation has been observed in the Laptev Strait region. The insect assemblages yield thermophilous taxa which indicate considerable warming (*Gyrinus opacus*, *Pelophila borealis*, *Carabus kolymensis*, *C. shilenkovi*, *Blethisa catenaria*, *Diacheila polita*, *Elaphrus lapponicus*, *E. riparius*, *Bembidion varium*, *Dicheirotichus mannerheimi*, *Agonum impressum*, *Sericoda quadripunctata*, *Pterostichus magus*, *Amara interstitialis*, *Colymbetes dolabratus*, *Hydrobius fuscipes*, *Cyrtoplastus irregularis*, *Anisotoma* sp., *Colon* sp., *Eucnecus tenue*, *Olophrum consimile*, *Gymnusa* sp., *Lathrobium longulum*, *Philonthus* sp., *Quedius* sp., *Caenocara bovistae*, *Aegalia kamtschatica*, *Corticaria* sp., *Hydrothassa glabra*, *Phaedon concinnus*, *Bromius obscurus*, *Gonioctena affinis*, *Notaris bimaculatus*, *Dorytomus imbecillus*, *Sciocoris*

*microphthalmus*, *Leptothorax acervorum*). The role of the steppe-tundra indicators (*Morychus viridis*, *Harpalus vittatus kiselevi*, *Cymindis arctica*, *Troglocollops arcticus*, *Chrysolina brunnicornis bermani*, *Coniocleon sp.*, *Stephanocleon eruditus*, *S. fossulatus*) was even higher here than in the pre LI and post LI periods. The environment was a mixture of shrub tundra and steppe-tundra.

A warming effect was much more significant in the North: LI climate was warmer than modern (shrub tundra in LI and arctic tundra nowadays), while the southern environment shows very little difference (forest tundra in LI and nowadays). The relatively warm northern treeless landscape became available for steppe-tundra biota during LI. The mosaic environment with grassy and shrub vegetation with little moss cover was favorable for mammoth fauna as well as for steppe-tundra insects. Refugia in the North probably helped grazing megafauna, including mammoth, to survive during LI. Another factor (more prominent in Eastern Beringia) was the presence of steppe-tundra areas inside the forest zone. These relict steppe areas in Beringia support the re-establishment of the steppe-tundra environment later in the Late Pleistocene.

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