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Институт систематики
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СИБИРСКОГО ОТДЕЛЕНИЯ РОССИЙСКОЙ АКАДЕМИИ НАУК

COLEOPTERA FROM THE LATE PLEISTOCENE FOREST REFUGIUM OF THE WEST SIBERIAN PLAIN

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ИЭРиЖ
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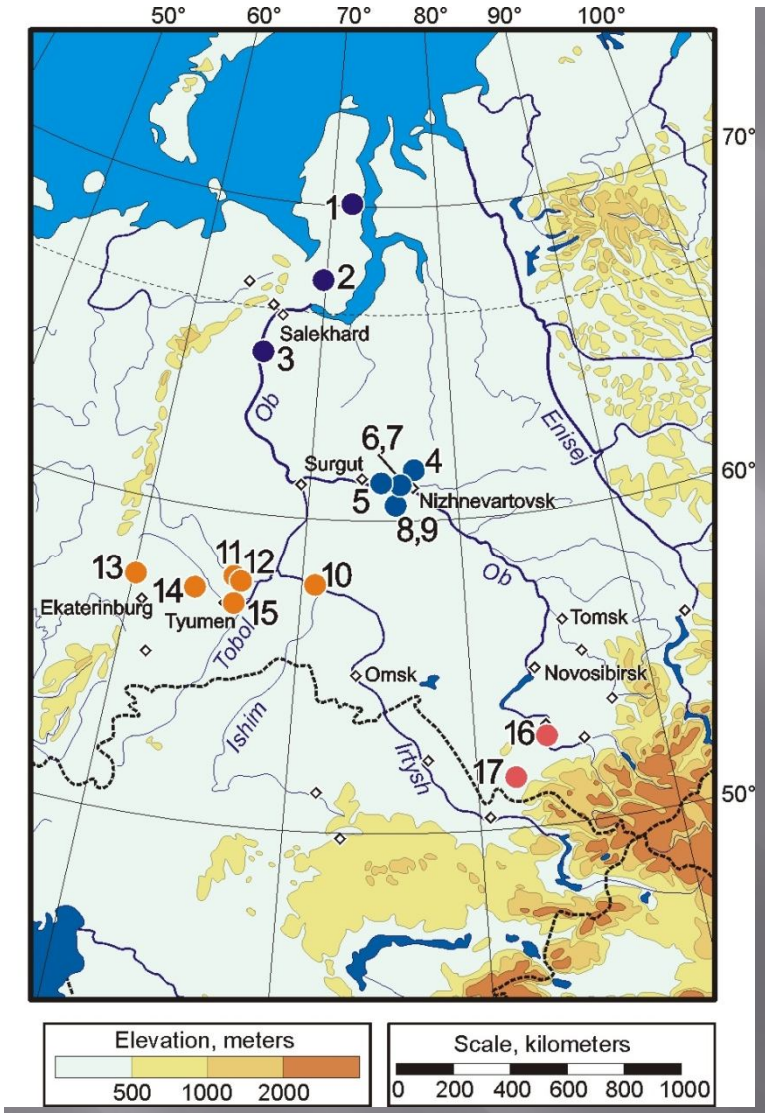
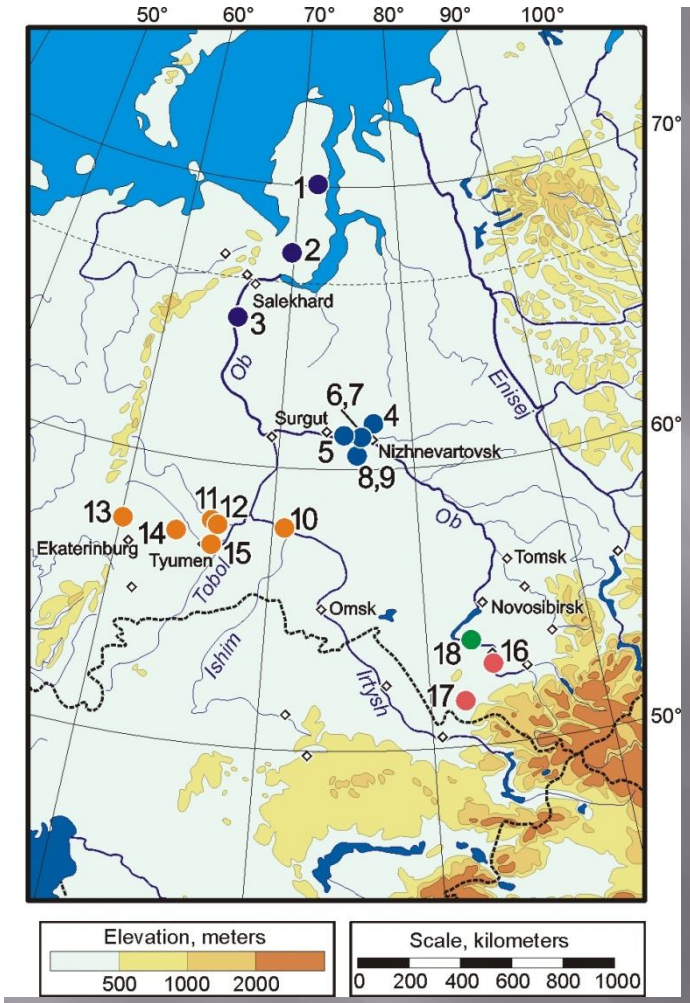


- Open unforested landscapes were predominated in the late Pleistocene (MIS 3 and MIS 2) of West Siberian Plain. This is shown in particular by the entomological data. Insect late Pleistocene assemblages from the north (70-60° N) were considered as the arctic type, and from the south (57-51° N) were assigned as non-analogous periglacial type or so called "*Otiorhynchus*-type fauna" (Legalov et al., 2016; Gurina et al., 2019). Forests are not typical for this time, and insects associated with arboreal vegetation were found in the late Pleistocene deposits sporadically.

MIS 3 deposits studied from West Siberian Plain and the Urals with types of entomocomplexes. Sites: 1 – Syoyakha-Mutnaya, 2 – Tyurseda-Khadyta, 3 – 430 km of Ob, 4 – Aganskiy Uval-1290/2, 5 – Lokosovo, 6 – Mega-2169, 7 – Mega-2172, 8–9 – Kul'egan-2247 (clearances I and II), 10 –Skorodum-95, 11 – Andryushino, 12 – Nizhnyaya Tavda, 13 – Shurala, 14 – Nikitino, 15 – Mal'kovo, 16 – Kalistratikha, 17 – Kizikha-2. Entomocomplexes: 1–9 – Arctic type (1–3 – analogs of the recent Arctic faunas, 4–9 – Arctic faunas with steppe elements); 10–17 – steppe type («*Otiorhynchus-type*» complexes) (10–15 – with Arctic and arctoboreal elements,16–17 – with a single arctoboreal elements).



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17 – Kizikha-2, 18 — Suzun-1 (and Suzun-2).
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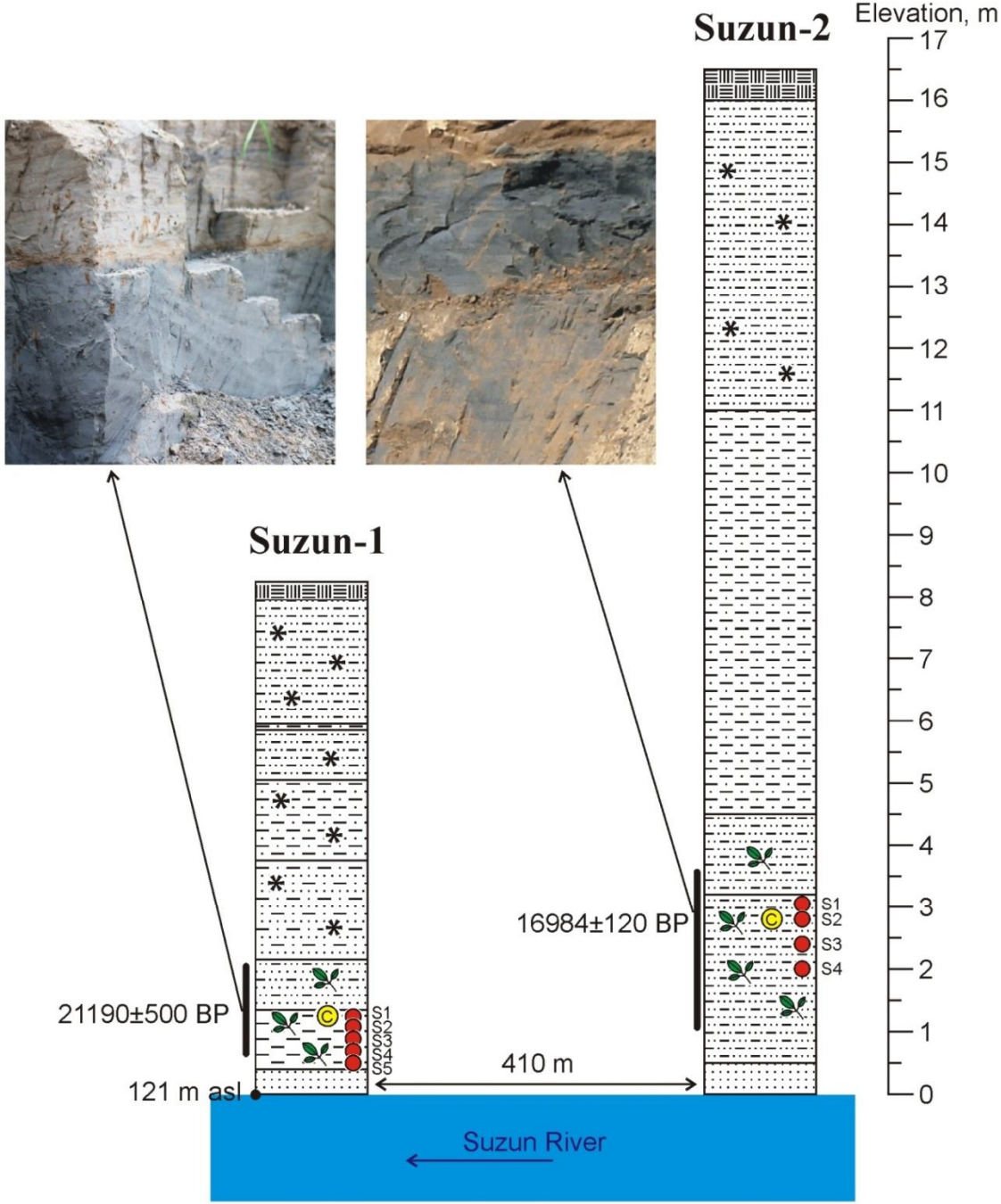
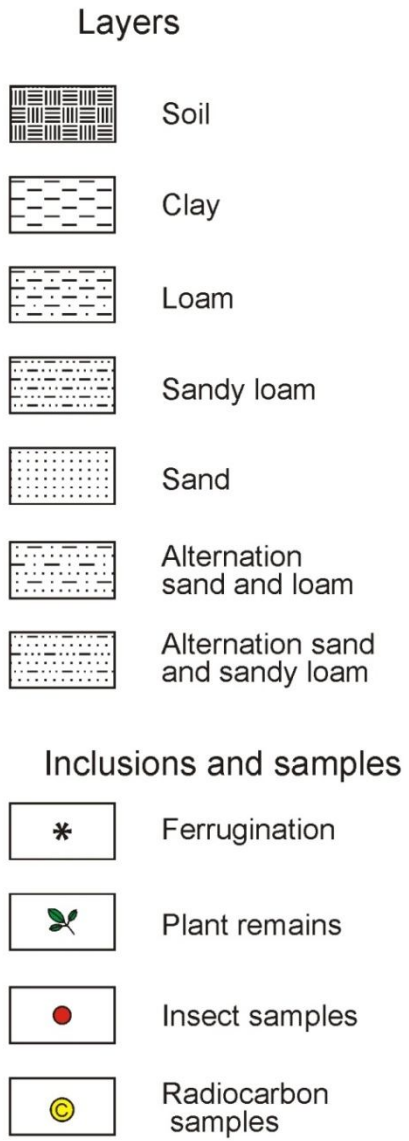
18 — steppe type with forest elements.

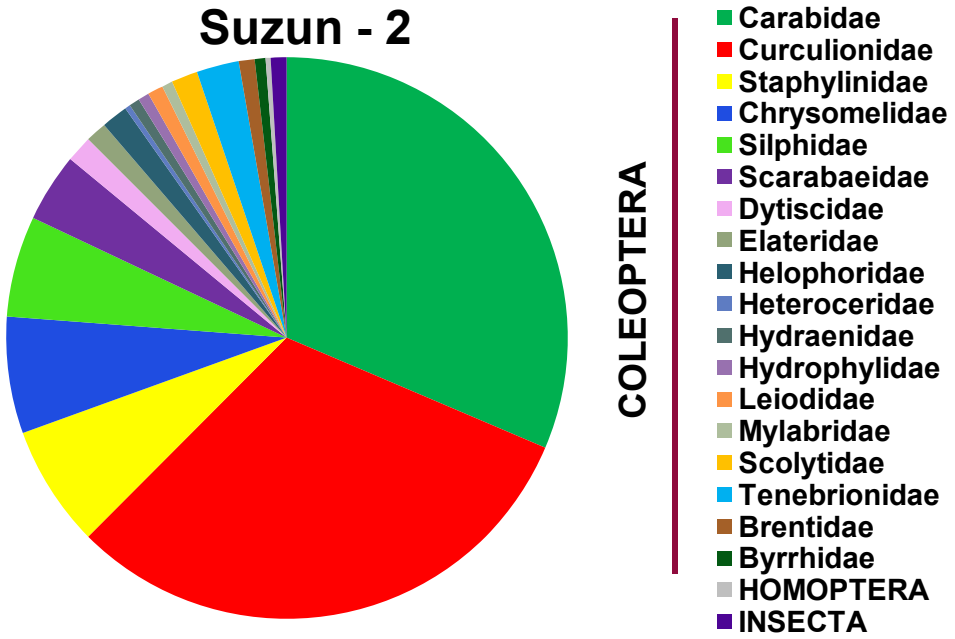
Suzun-1 and Suzun-2 sites are somewhat specific and differ from typical periglacial fauna of the region because of Quaternary deposit insect assemblages include forest species. Both are located in the Suzun River valley, right tributary of upper Ob River (Novosibirskaya Oblast, Russia).

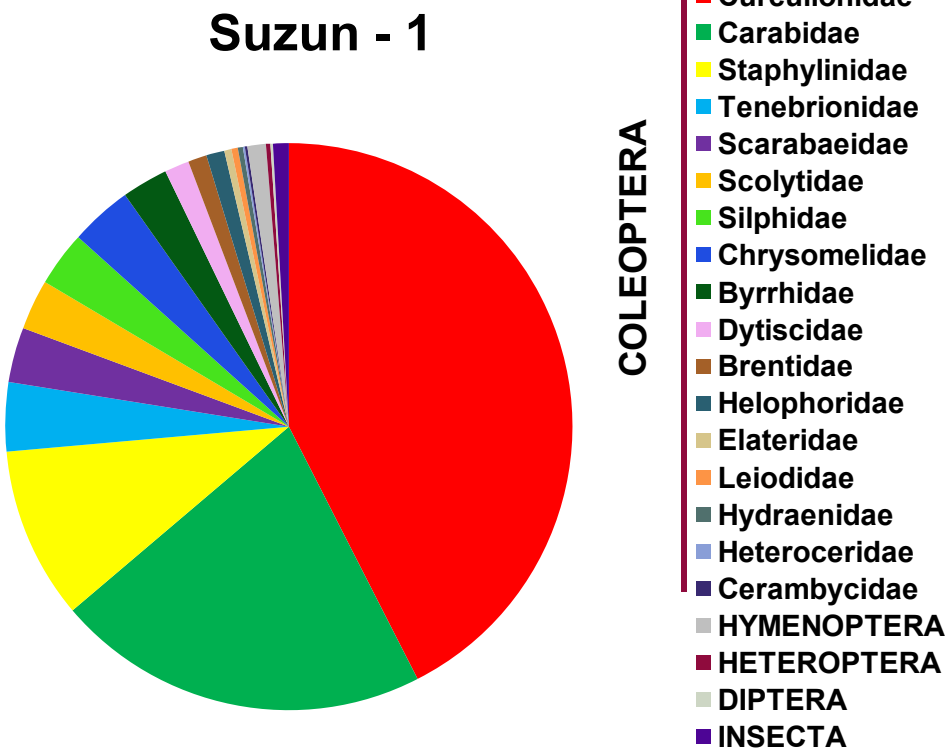
Scheme of the vertical sections Suzun-1 and Suzun-2





Ratio of Coleoptera fragment numbers from different families





Insect assemblages Suzun-1 and Suzun-2 as well as different samples are very similar to each other. Coleoptera predominated in all samples and represented by al least 19 families and more than 100 species. Curculionidae predominated in the Suzun-1 (39% of fragments) and Carabidae accounted 20%. The same two families predominated in the Suzun-2 assemblage and represented there almost equally, about 30% each. Staphylinidae, Tenebrionidae, Chrysome lidae, Silphidae, and Scarabaeidae are also quite abundant in the both sites.

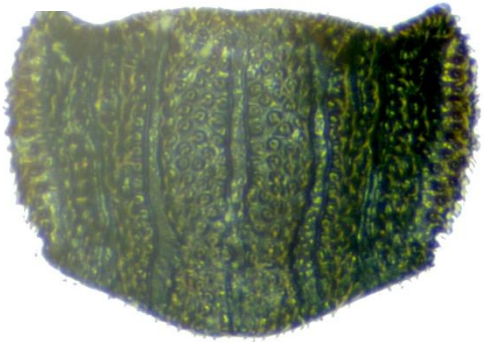
Tundra

Forest

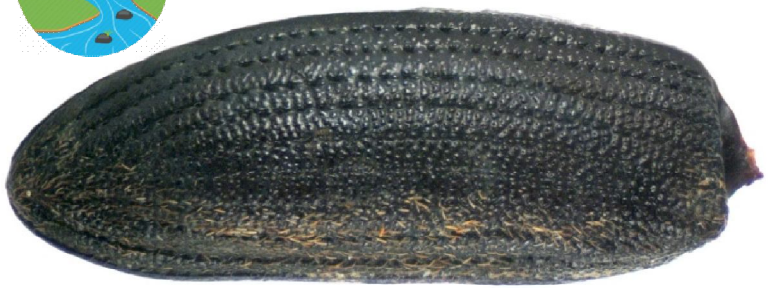
Steppe

Ecological complexes

Aquatic



Riparian



Saline

Steppe complex

Carabidae
- *Amara* cf. *depressangula* ,
- *Amara rupicola*,
- *Curtonotus* cf. *fodinae*,
- *Harpalus pusillus*-group,
- *Harpalus salinus*,
- *Cymindis binotata*,
- *Cymindis* cf. *kasakh*

Silphidae
- *Aclypea bicarinata*,
- *Aclypea calva*,
- *Aclypea sericea*

Byrrhidae
- *Porcinolus murinus*

Meloidae
- *Mylabris ledebouri*

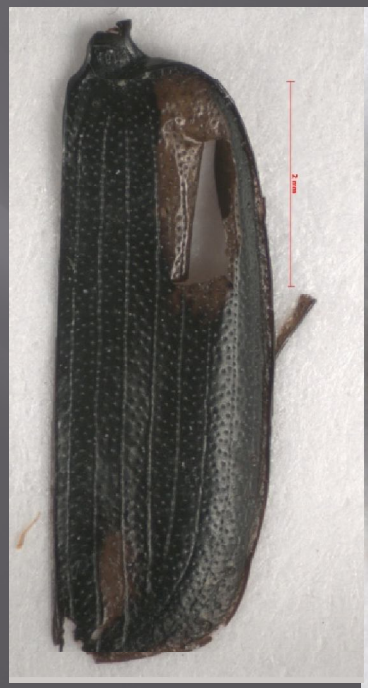
Tenebrionidae
- *Scytosoma pygmaeum*,
- *Platyscelis hypolitha*

Cerambycidae
- *Eodorcadion carinatum*

Curculionidae
- *Otiorhynchus* cf. *ursus*,
- *Otiorhynchus subocularis*,
- *Otiorhynchus pullus*

Porcinolus murinus

Otiorhynchus subocularis



Cymindis binotata

Otiorhynchus ursus

Tundra complex

Carabidae

- *Diacheila polita*,
- *Curtonotus* cf. *alpinus*,
- *Pterostichus* (*Cryobius*) spp.

Pterostichus (*Cryobius*) sp.

Diacheila polita

Forest complex

Scolytidae

- *Phloetribus spinulosus*

Carabidae

- *Carabus henningi*,
- *C. regalis*,
- *Pterostichus* cf. *altainus*,
- *Pterostichus* cf. *maurusiacus*

Pterostichus cf. *altainus*

Phloetribus spinulosus

Carabus regalis

Pterostichus cf. *maurusiacus*

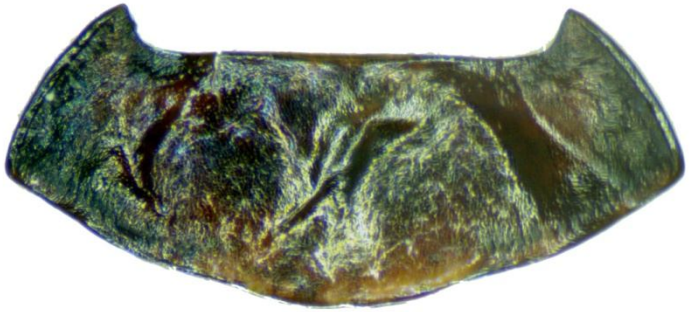
Aquatic complex

Dytiscidae
- *Porhydrus lineatus,*
- *Nebrioporus ?depressus,*
- *Agabus pallens,*
- *Agabus labiatus,*
- *Agabus congener,*
- *Agabus coxalis,*
- *Agabus adpressus,*
- *Ilybius subaeneus*

Helophoridae
- *Helophorus obscurellus,*
- *Helophorus ?parajacutus,*
- *Helophorus orientalis,*
- *Helophorus pallidus*

Hydraenidae
- *Ochthebius* spp.

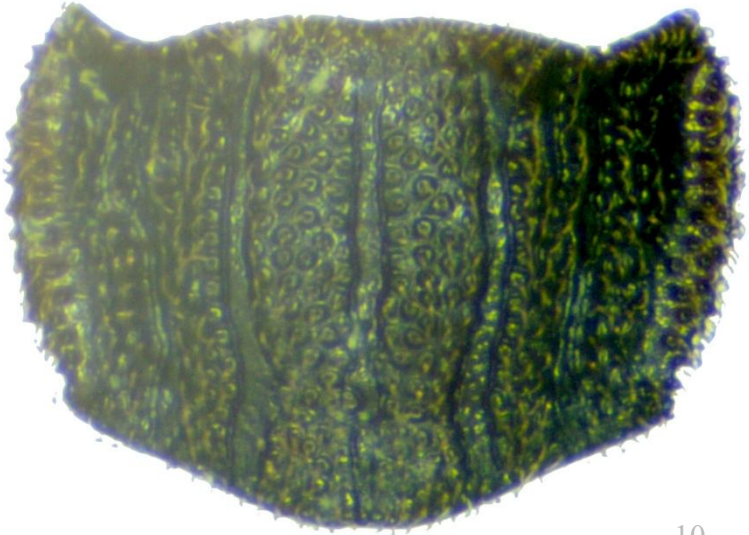
Agabus adressus



Agabus congener

Agabus labiatus

Helophorus sp.



Helophorus obscurellus

Riparian complex

Carabidae
- *Nebria gyllenhali,*
- *Blethisa multipunctata,*
- *Dyschiriodes tristis,*
- *Bembidion lapponicum,*
- *Bembidion almum almum,*
- *Bembidion* cf. *paediscum,*
- *Bembidion obliquum,*
- *Bembidion difficile,*
- *Bembidion* cf. *infuscatum,*
- *Bembidion obscurellum,*
- *Bembidion* cf. *scopulinum,*
- *Bembidion* cf. *roborovskii,*
- *Bembidion kokandicum,*
- *Patrobus* cf. *septentrionis,*
- *Agonum carbonarium*

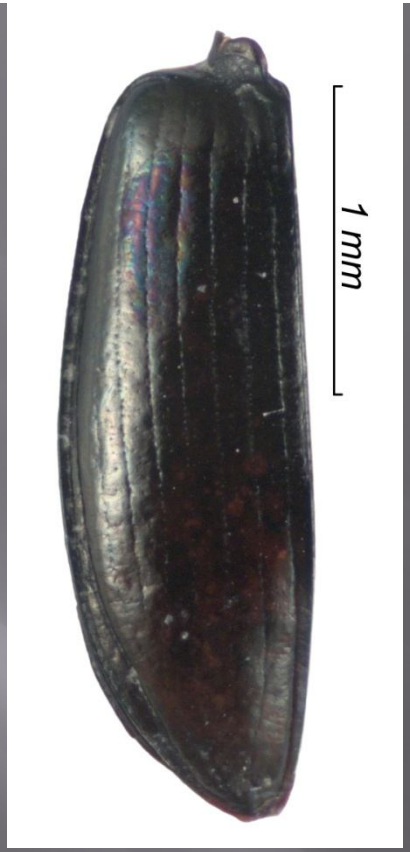
Staphylinidae
- *Bledius* sp.,
- *Stenus* sp.

Scarabaeidae
- *Aegialia* sp.

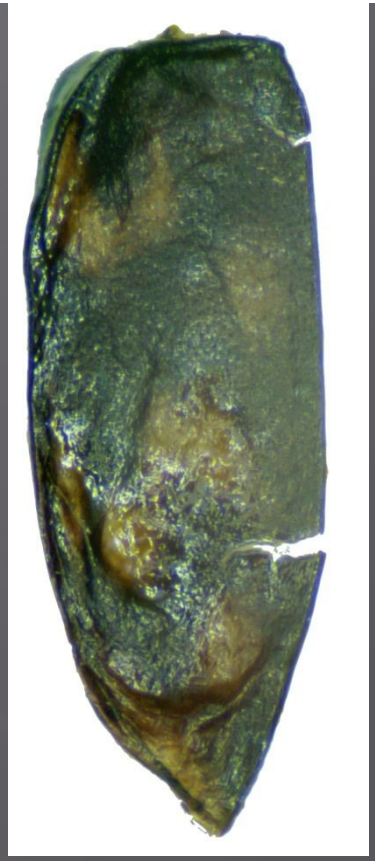
Heteroceridae
- *Heterocerus marginatus,*
- *Augyles* sp.

Chrysomelidae
- *Donacia* sp.

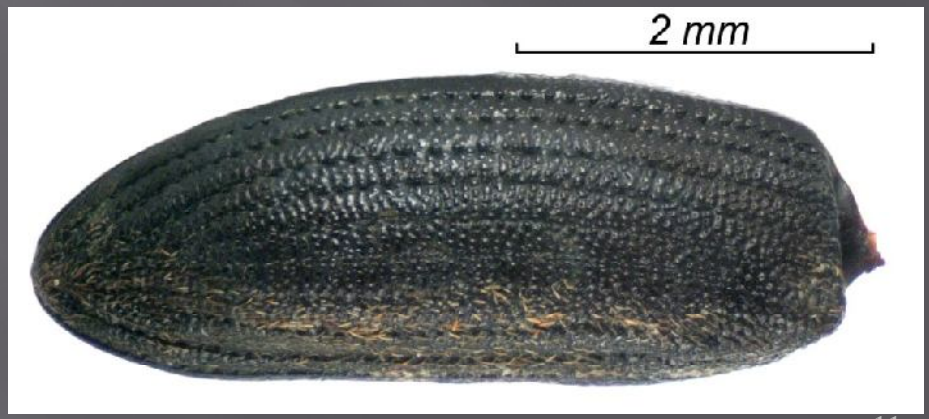
Curculionidae
- *Tournotaris bimaculata,*
- *Bagous* sp.



Bembidion cf. *roborovskii,*



Heterocerus marginatus



Tournotaris bimaculata

Saline complex

Carabidae

- *Bembidion* cf. *aeneum*,
- *Pogonus punctulatus*,
- *Poecilus* cf. *ravus*,
- *Harpalus amputatus*

Tenebrionidae

- *Centorus rufipes*

Harpalus amputatus

Centorus rufipes

Conclusion

The presence of bark beetle *Phloetribus spinulosus* associated with *Picea,* and some other forest species allows to reconstruct fir forest at river valleys. However the proportion of steppe and forest species of Coleoptera in the Suzun assemblages shows the forests probably occupied restricted area only, and opened periglacial steppe landscapes predominated in the region. The high similarity of Suzun-1 and Suzun-2 insect assemblages confirms a gradual MIS3 – MIS2 transition in the region, and indicates the forest refugium existed here quite long time, at least a few thousand years.

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