The carbon isotopic composition of the Pai-Khoi amber-like fossil resin (NW Asia)

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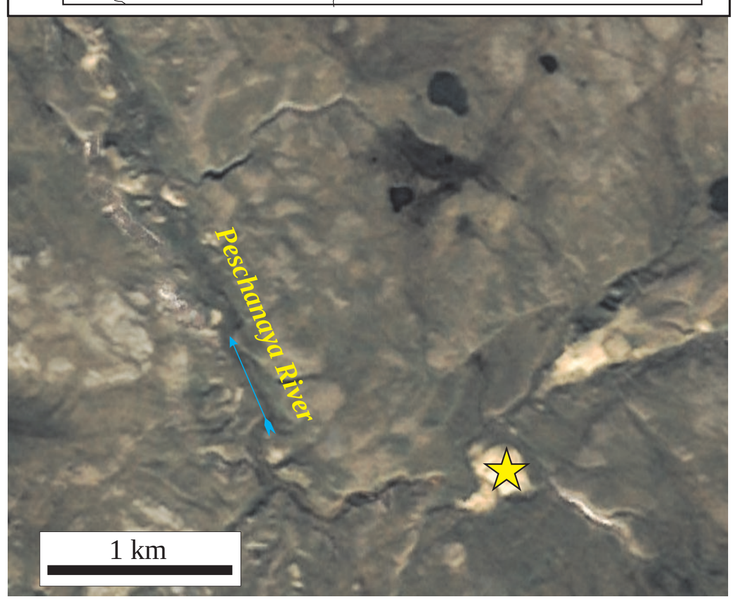
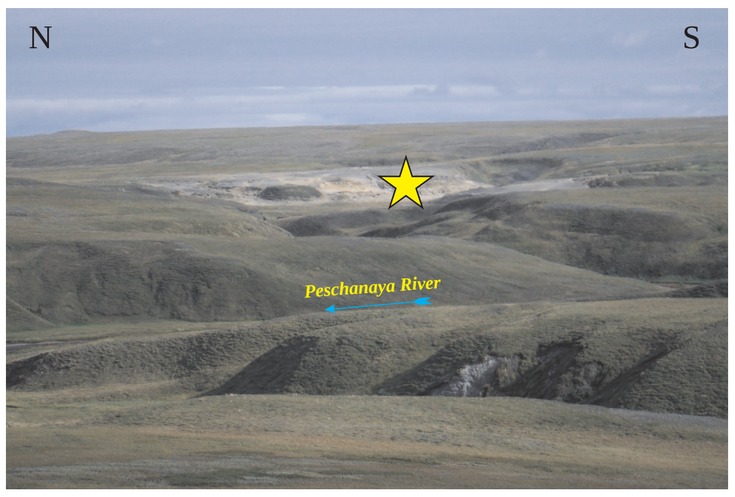
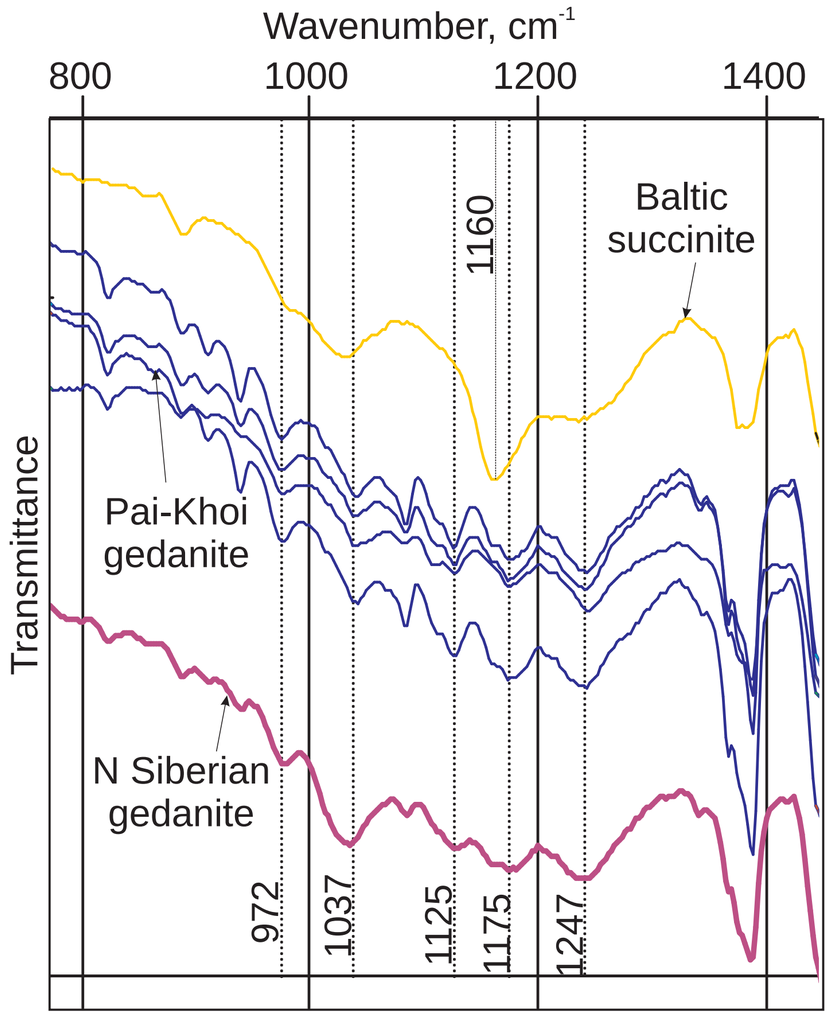
The fossil resin localities are known in the Quaternary deposits of the NE Pai-Khoi. The fossil resins of these localities are less studied in contrast to the Baltic and European ambers. This study is based on the collections of the fossil resins stored in the Geological Museum (Syktyvkar, Russia; collection #160). Totally 19 samples of Pai-Khoi amber-like resin (retinite group) were studied. The samples were collected from the Quaternary placer on the bank of the Peschanaya River (N 69°36'44.91“ E 62°07'17.24”). The material of the placer is supposed to be reworked deposits of the Late Cretaceous - Early Paleogene Sayakha Formation.

The Pai-Khoi amber-like resin
is honey-yellow in color and bright.

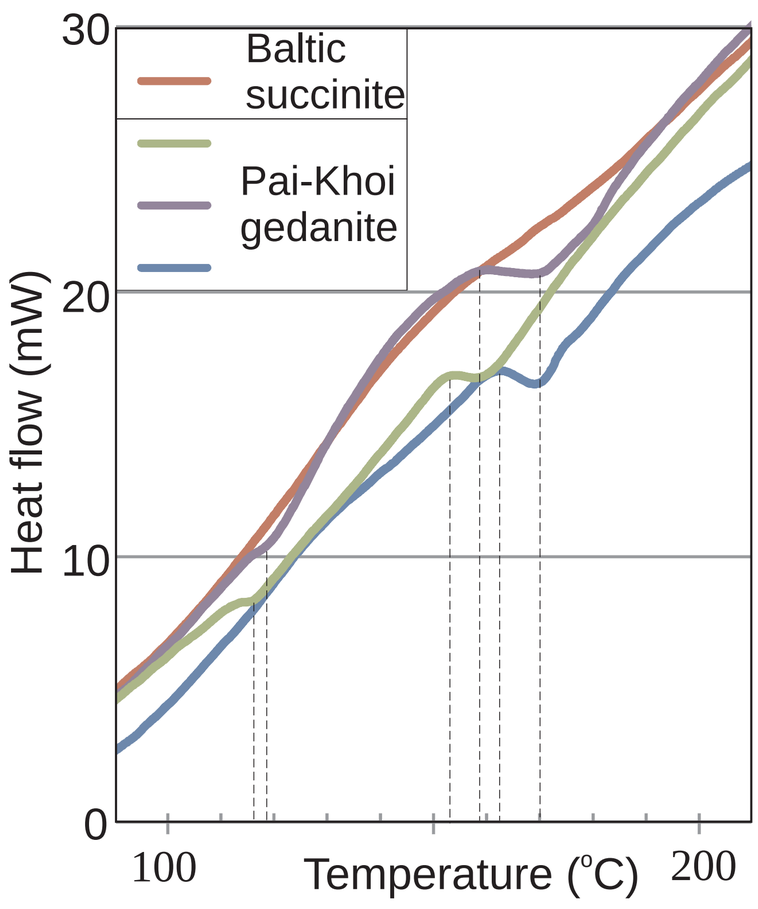




The study locality. The Peschanaya River.



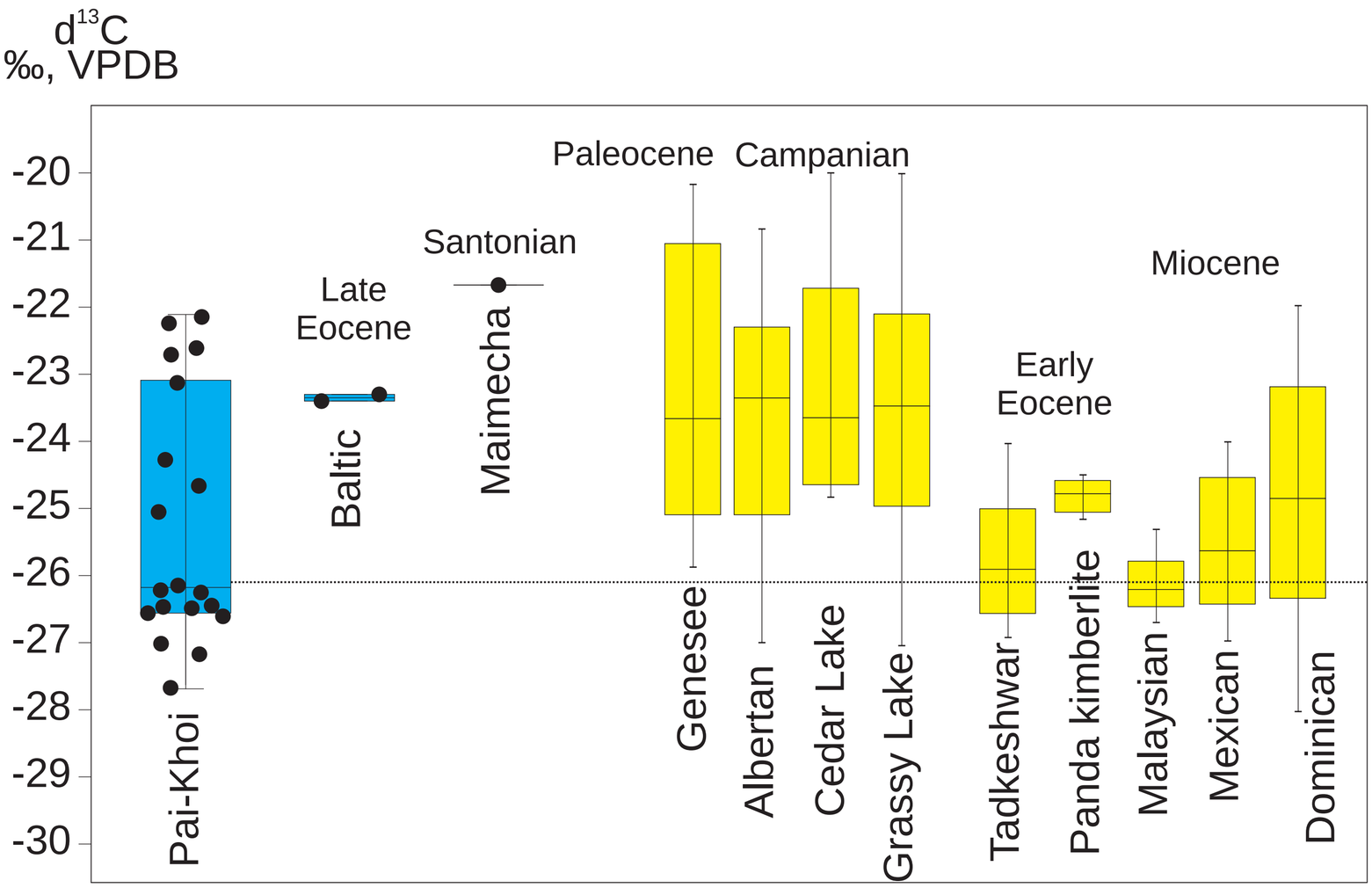
The FTIR spectra show a lack of a “Baltic shoulder” at 1247 - 1160 cm-1 in association with a series of bands of low intensity at 1247, 1175, 1125, 1037, and 972 cm-1.



The differential thermal patterns demonstrate an exothermic peak at 150-160° and weak endothermic peaks near 120 and 170°.

Results of FTIR spectroscopy and differential thermal analyses suggest that the amber-like resin corresponds to gedanite. The examined Pai-Khoi gedanite shows presence the distinct band at 1460 cm^{-1} in association of characteristic absorption spectrum structure in the interval from 1450 cm^{-1} to 700 cm^{-1} , which are similar to the spectrum of pinaceous type of resin (Tappert et al., 2011) .
Some difference between spectra of the Pai-Khoi gedanite and the pinaceous type of resin may be attributed to diagenetic processes and/or specific type of the resin-producing plants. In any case, it is reasonable that the Pai-Khoi resin-producing plants had close relation to Pinaceae.

The two probable sources of
the Peschanaya River
amber placer



The δ13C value in the Pai-Khoi samples ranges from -27.6‰ to -22.2‰. The mean value of δ13C for the measured samples is about -25.2‰ (standard deviation 1.8, n=13). The wide range of variations of the δ13C values of gedanite of the Peschanaya River locality suggests diverse sources of the gedanite in this placer. Probably the placer had been formed by the material reworked from different parts of the sequence of the Sayakha Formation.