

United they stand: invasive association of four-eyed fir bark beetle and ophiostomal fungus destroy fir taiga forest in Siberia

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Polygraphus proximus Brandford (Coleoptera: Scolytidae) and its associate, blue-stained fungus *Ophiostoma aoshimae* Ohtaka, Masuya et Yamaoka are responsible for diffusively widespread outbreak in fir taiga forests of Southern Siberia. The association was moved here from the Russian Far East presumably 15-20 years ago with the row logs transported by trains from the Russian Far East and settled local populations expanded to the South and North from the Trans-Siberian railroad.

For a moment outbreaks officially cover up to 40 thousand hectares in Tomsk, Kemerovo Oblasts, Krasnoyarsk Kray and The Republic of Altay (but much more in reality) and *P. proximus* is considered to be the most aggressive bark beetle ever found on firs in Siberia. Previously, only *Monochamus urussovi* Fish., a cerambicide species, was known to be able to attack and kill healthy firs.

Both beetle and fungus were never recorded in Siberia before and appear to be extremely aggressive for the local fir *Abies sibirica* Ledeb. More intriguingly, *P. proximus* introduced into new environment, is acquiring fungi with which it was not associated in the Far East. A local fungus *Leptographium sibirica* Jacobs et Wingfield is also transported by the beetle from tree to tree. Previously *L. sibirica* was associated exclusively with the aggressive pest of firs in Siberia – sawyer beetle *M. urussovi* where it was believed to be a main tool of firs weakening. The introduced insect has thus received a novel suite of fungal associates and this might explain why a relatively non-aggressive insect pest in the Far East has become a serious and damaging pest in Siberia.

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