

Inonotus obliquus conks growing on *Alnus incana* have remarkable anticancer properties

November 11 2022



Black fungus (*Inonotus obliquus*) parasitizing on alder tree. Credit: Ahto Täpsi

A study led by researchers of the Estonian University of Life Sciences demonstrated that *Inonotus obliquus*, a fungal growth parasitizing the

Alnus species, has comparable properties to the fungus growing on *Betula* species.

Inonotus obliquus is the fungus known to parasitize on *Betula*. *Inonotus obliquus* grows in the Northern Hemisphere and belongs to the family of Hymenochaetaceae in the order Hymenochaetales and causes stem rot on several broadleaved tree species.

In Estonia, the fungus grows primarily on *Betula pendula*, *Betula pubescens*, *Alnus incana* and *Alnus glutinosa*. Sterile conks of *I. obliquus* contain [bioactive compounds](#) known to have anti-cancer effects that act against the proliferation of cells of leukemia and lung and colon adenocarcinoma, hepatocellular carcinoma of the liver, oral epidermoid carcinoma and prostate cell carcinoma.

The bioactive compounds extracted from the *I. obliquus*, especially betulin, betulinic acid and inotodiol, inhibit the development of cancer cells. Previous studies have concentrated on the *I. obliquus* on [birch trees](#), but it is not known whether the conks parasitizing on other tree species can offer equivalent properties.

The current study is the first to determine the bioactive compounds of the *I. obliquus* parasitizing on alder species. The results demonstrate convincingly that conks of *I. obliquus* parasitizing on *A. incana*, which is growing well in Estonia, contain betulin, inotodiol and lanosterol to a similar extent as *I. obliquus* on *B. pendula*.

Surprisingly, the *A. incana* conks contained even up to 30 times more betulinic acid than the conks parasitizing on *B. pendula*, 474–635 µg/g and 20–132 µg/g, respectively. The conks parasitizing on gray alder contained more beta-glucans, polyphenols and flavonols compared to the conks on silver birch. However, betulinic acid, betulin and inotodiol are more important in terms of anti-cancer effect.

Therefore, there is no substantive difference whether *I. obliquus* grows on a gray alder or a silver birch. However, further research is still needed to establish the [potential effect](#) of *I. obliquus* conks on alder on various cancer cell lines. Preliminary research also suggests the possibility that *I. obliquus* may have other valuable properties, such as effects on the immune system.

So what is the importance of the research for forestry and landowners? Alder is growing well in Estonia. It would increase the still comparatively low economic value of gray alder generally considered suitable mostly for firewood by cultivating this host *I. obliquus* and would offer landowners, especially small landowners, an opportunity to earn.

The article is not calling for mass inoculation of trees with a pathogenic fungus. The risks and [best practices](#) for inoculating trees need to be researched before a tree inoculation campaign, and only then one can proceed to cultivation. The study shows that gray alder is not a worthless [tree species](#), but rather an important resource that can be valued in many ways.

The research is published in *Biomolecules*.

More information: Rein Drenkhan et al, Comparative Analyses of Bioactive Compounds in *Inonotus obliquus* Conks Growing on *Alnus* and *Betula*, *Biomolecules* (2022). [DOI: 10.3390/biom12091178](https://doi.org/10.3390/biom12091178)

Provided by Estonian Research Council

Citation: *Inonotus obliquus* conks growing on *Alnus incana* have remarkable anticancer properties (2022, November 11) retrieved 24 June 2024 from

<https://phys.org/news/2022-11-inonotus-obliquus-conks-alnus-incana.html>

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