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Betulin Isolation from Activated Birch-Bark and Testing of its Biological Activity

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The birch-bark is manufactured in a large amount as a side product of birch-wood harvest and processing. The most valuable extractive compound of the birch-bark is the betulin which exhibits the biological activity.

Betulin and its derivatives has good prospects for their application in medicine and pharmaceutics industry. The known methods of betulin producing are based on its extraction isolation from the outer layer of a birch bark.

This presentation describes the more simple methods of betulin isolation from a birch-bark without its preliminary fragmentation on the outer-bark and inner-bark.

It was found that the hexane extract isolated with the yield 10.5 wt.% on a.d. bark contains near 90% of betulin. Neutral and acidic components of the hexane extract were separated by 20% NaOH. Along with the betulin, the polyphenols, tanning substances and sugars were found in ethylacetate and isopropanol extracts.

The short-time activation of a birch bark by supper heated steam increases by 1.5-2.0 times the yield of the extractive substances. But the amount of betulin remains constant in all hexane extracts independing on the conditions. The composition of the extracts was studied by chemical, FTIR, H^1 NMR and GC-MS methods.

The toxicological and gastric-protective properties of betulin and its hexane extract were studied on the group of white mouses. According to obtained results the betulin and hexane extract of betulin are low-toxic substances.

The minimal fatal dose (LD_{16}) and avarsge fatal dose (LD_{50}) are 6500 mg/kg and more than 9000 mg/kg for betulin respectively. For example betulin extract the LD_{16} is 5750 mg/kg and LD_{15} – 8500 mg/kg.

The study of gastric-protective properties of these substances has shown their high ability to protect a formation of the ulcers induced by indometacin.