



Medicinal Properties Of Dwarf Mountain Pine (*Pinus mugo Turra*): A Literature Overview

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Introduction: Dwarf mountain pine (*Pinus mugo*), was historically used as a medicinal herb. We present here a brief overview of its possible therapeutic effects and applications in today's medicine.

Aim: We aim to assess and quantify the historically recognised medicinal qualities of *Pinus mugo* by identifying and reviewing its biologically active substances and their possible application in modern medicine.

Materials & Methods: We reviewed articles issued by the European Forest Institute, the European Atlas of Forest Tree Species and the PubMed database using *Pinus mugo* as keywords. Results: α -pinene and β -pinene are some of the biologically active molecules found in the *Pinus mugo* species. Several studies proved their anti-inflammatory, analgesic, bronchodilatory, cardioprotective, neuroprotective as well as anxiolytic and anticarcinogenic effects. α -pinene provides antioxidant activity through several mechanisms: reduction of lipid peroxidation induced by H_2O_2 , ROS formation and NO release. Its cardioprotective effects are due to prevention of low-density-lipoprotein (LDL)-oxidation. Also, by blocking efflux pumps of *S. aureus*, α -pinene has a synergistic effect with several antibiotics..

Conclusion: Our results provide an overview of the so far identified medicinal properties of *Pinus mugo*. There is clearly an insufficient understanding of many of the historically used medicinal herbs and their underlying mechanisms of action, which presents significant opportunities for investigation of potentially effective treatments. Increasingly health-conscious members of the public often use herbal supplements as "aid" in therapy of their conditions; however, family physicians are usually unfamiliar with potential interactions between prescribed drugs and herbal supplements. It is necessary to broaden the understanding of traditional herbal supplements in order to provide better advice to patients about their safe and effective use, thereby improving patient care and health related outcomes.

Keywords: alfa-pinene, essential oils, herbal medicine, monoterpene, *Pinus mugo*