OAK BARK

Quercus robur L.

Family

Fagaceae.

Parts Used

Bark.

Description

Oak bark comes from the common Oak tree that is native throughout Europe. Often known as English or French Oak, this well known tree is a member of the Fagaceae family. This large tree grows up to 35 to 40 metres in height and is prized for its impressive and majestic habit and long life – some specimens spanning more than a thousand years old. Popular with many birds and animals the tree historically made up many of Europe's forests. Oak trees have thick, green lobed, short-stemmed leaves that reach up to 14cm long and turn golden brown and fall during autumn. Flowers emerge in mid spring in male or female clusters followed by acorns (fruits) that ripen from green to brown during autumn on long stalks. Both the bark and leaves of the Oak tree have been used medicinally.

Traditional Use

The European Oak tree has been used in both industry and medicine for thousands of years.[1] The timber is very hard and strong and was sought after for building and furniture. The tree is sometimes called Tanner's Bark – owing to the astringency and tannins of the bark - which made it a useful tanning agent. The astringent agents found in Oak have been employed for many complaints – including diarrhoea, vomiting, mouth ulcers, sore throats and leucorrhea. The tree was sacred to the

Druids and much folklore exists about its magical uses, including the acorns being used for fertility.[2] The acorns were also soaked, dried and ground into a flour, and used by the peasants. They were also fed to pigs.

- Digestive System: diarrhoea, dysentery, vomiting, haemorrhoids,
- ENT: throat infection, tonsillitis, bleeding gums
- Skin: topical for bleeding, infections, inflammation, eczema
- Genitourinary: kidney tonic, leucorrhoea

Constituent

Tannins constitute 15 to 20% of the bark – subcategories include castalagin/vescalagin, gallic acid, valoneic acid bilactone; monogalloyl, digalloyl & trigalloyl glucose, ellagic acid rhamnose, quercitrin and ellagic acid.[3] Oak also includes flavonoid glycosides (including rutin), proanthocyanidins[4] and alpha-tocopherol.[5]

Actions

Astringent, anti-inflammatory, antioxidant, antimicrobial, anticancer, tonic.

Pharmacological Activity

Antioxidant Activity

The topical application of antioxidants may be beneficial for the protection of the skin against UV damage. An extract of *Quercus robur* leaves was evaluated as a potential topical antioxidant. Skin irritation potential was investigated by performing an *in vivo* patch test in 19 volunteers. The extraction solvent which resulted in the highest activity was a 40% ethanol extract and thus it was selected for further preparation of this extract. Three phenolic compounds were identified in the extract namely: ellagic acid, rutin and hyperoside. The patch test carried out, showed that the extract can be regarded as safe for topical application.[6] Another study found *Quercus robur* exhibited a strong protective activity on cell damage induced by active oxygens.[7]

Aqueous extracts of 30 plants were investigated for their antioxidant properties using radical scavenging capacity, oxygen radical absorbance capacity (ORAC), superoxide dismutase and ferric reducing antioxidant potential (FRAP) assays. Antioxidant properties and total phenolic content differed significantly among selected plants. It was found that oak (*Quercus robur*), pine (*Pinus pinaster*), and cinnamon (*Cinnamomum verum*) possessed the highest antioxidant capacities in most of the methods used, and thus could potentially be rich sources of natural antioxidants. A significant relationship between antioxidant capacity and total phenolic content was found, indicating that phenolic compounds are the major contributors to the antioxidant properties of these plants.[8]

Natural plant extracts were screened for scavenging activity against pro-oxidant reactive species in view of using them in new topical antioxidant formulations. *Castanea sativa* leaves and *Quercus robur* leaves were evaluated for their putative *in vitro* scavenging effects on a range of reactive oxygen species (ROS) including superoxide, hydrogen peroxide and singlet oxygen. The extracts presented a high potency to scavenge the tested reactive species. The researchers concluded that the observed effects might be relevant in the development of topical antioxidants.[9]

Antimicrobial Activity

The multifunctional ExtraChrom instrument was used in the extraction of antimicrobial and radical scavenging components from oak bark. Extracts were tested using agar diffusion method on *Staphylococcus aureus*, *Enterobacter aerogenes* and *Candida albicans*. Some extracts showed moderate bactericidal, fungicidal, bacteriostatic and fungistatic activity. Thus, the antiradical and antimicrobial activity of oak was shown to be beneficial in the storage of wine against oxidation and in human microbial exposure.[10]

Anthelmintic Activity

The effects of the tannin content of *Quercus robur* on worms of the gastrointestinal tract were tested *in vitro*. The effects were measured on 3rd-stage larvae and adult worms with significant inhibitory effects obtained at both stages. In order to assess the activity of tannins, polyethylene glycol (PEG), an inhibitor of tannins, was added to oak extracts. Without PEG, significant inhibitory effects on 3rd-

stage larvae and adult worms were seen. After addition of PEG, the larval migration and motility of adult worms were restored in most cases. This suggests that the tannin content of *Quercus robur* is partly responsible for the effects.[11]

Anticancer Activity

The anti-thrombin and anti-cancer activity of Oak extract were examined *in vitro* using mouse leukaemia cells to screen the extracts for activity against cancer. The methanol extracts of *Quercus robur* demonstrated high activity against both thrombin and cancer.[12]

A range of extracts from 16 common Belgian forest trees were evaluated for *in vitro* growth inhibitory activity against the human colon cancer, prostate cancer and glioblastoma cell lines. Extracts from some of the trees, including *Quercus robur* (leaves) showed potent *in vitro* growth inhibitory activity and the authors concluded that the extracts could become easily affordable sources of potential new anticancer agents.[13]

Indications

- Diarrhoea, dysentery
- Sore throat, tonsillitis (gargle), bleeding gums
- Haemorrhage
- Leucorrhoea
- Possible use in oxidative stress and cancer
- Skin infections (topical)

Energetics

Bitter, cooling, drying.

Use in Pregnancy

Not generally used or recommended during pregnancy.

Contraindications

Topical application of Oak should be avoided in cases of significant damage to skin surface.[14]

Drug Interactions

Due to the tannin content, absorption of alkaloid and alkaline drugs may be inhibited or reduced and caution is warranted.

Administration and Dosage

Liquid Extract:	1:1
Alcohol:	30%
Weekly Dosage:	20 to 40mL

References

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