ABSTRACT

Medicinal plants are very important and are used world widely for treatment of acute and chronic diseases. Berberis aquifolium is a medicinal plant used in herbal and homeopathic system of medicine to treat various ailments. It is a well-known plant since the time of Hippocrates and it revolutionize the system of medicine because of its versatile pharmacological activities. Present attempt has been made to gather the taxonomical, biological, geographical, traditional and homeopathic uses of Berberis aquifolium.

KEYWORDS: Berberis aquifolium, Homeopathic, biological activities.

Systematic taxonomy

<table>
<thead>
<tr>
<th>Source</th>
<th>Vegetable kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order</td>
<td>Ranunculales</td>
</tr>
<tr>
<td>Family</td>
<td>Berberidaceae</td>
</tr>
<tr>
<td>Genus</td>
<td>Mahonia</td>
</tr>
<tr>
<td>Species</td>
<td>Berberis aquifolium Pursh</td>
</tr>
<tr>
<td>Synonyms</td>
<td>In English: Rocky mountain grape. In French: Vinettier. In German: Gemeiner sauardorn.</td>
</tr>
<tr>
<td>Part used for</td>
<td>Roots</td>
</tr>
</tbody>
</table>
preparation of homeopathic mother tincture
Homeopathically proved by Herbert

Botanical description of *Berberis aquifolium*: *Berberis aquifolium* is a shrub gaining height of 0.9-1.8 m. It has smooth stem and yellow wood. Leaves are imparipinnate with 5-9 sessile leaflets of oblong or ovate shape, dark green in colour, 3.5-8 cm long, spinulose dentate without spine at base, erect and fascicled racemes\(^1\). Flowers of *Berberis aquifolium* are golden yellow in colour often reddish tinged with dense erect racemes. Berries are small, blue or dark purple containing one seed whereas fruit berries are bluish pruinose containing 2-5 shiny red brown seeds and dark red juice.\(^{2,3}\)

![Figure 1: Different parts of *Berberis aquifolium*](image1.png)

**Figure 1**: Different parts of *Berberis aquifolium*.

![Figure 2: Dry roots of *Berberis aquifolium*](image2.png)

**Figure 2**: Dry roots of *Berberis aquifolium*.

**Distribution of plant**: *Berberis aquifolium* is distributed in Western United States, especially abundant in the northern part of Pacific coast, United Kingdom, Washington and California.\(^{4,5}\)
**Active principle:** It contains many pharmacologically important alkaloids such as berberine, oxycanthine, berbadine, candaine, hydrastine, Isocorydine, mahonine, palmatine, Jatrorrhizine, various protoberberine, benzylisoquinoline, berbamine, magnoflorine and also resins.[6-8]

![Structural formula of berberine.](image)

**Figure. 3: Structural formula of berberine.**

**Traditional uses of Berberis aquifolium**

Traditionally *Berberis aquifolium* is used for treatment of dermatological complaints such as pimples, dryness, roughness and scales on skin, scalp eruptions spreading to face and neck. Psoriasis, acne, eczema, pruritus and glandular induration is also treated by *Berberis aquifolium*. It also improves nutrition by stimulating all glands. It gives good results in chronic catarrhal affections, secondary syphilis, hepatic apathy, ailing headache. It is used in improving face complexion. It reduces stitching, crampy pains during urination due to passing thick mucous and red sediments.[9-12]

**Method for preparation of mother tincture**

Mother tincture of *Berberis aquifolium* is prepared from its roots. For this purpose, 100 grams of *Berberis aquifolium* in coarse powder, 300ml of purified water and 730ml of strong alcohol are used to make one litre of mother tincture of *Berberis aquifolium*.[3]

**Pharmacodynamics of Berberis aquifolium mother tincture**

*Berberis aquifolium* has affinity for multiple systems such as nervous system, digestive system, urinary system and skin.[13]

**Physio-pathological changes produced by Berberis aquifolium during proving**

*Berberis aquifolium* affects the sensorium of the body and cause feeling of band just above ears along with bilious headache and scaly eczema. Digestive is also affected by it especially oral cavity; tongue have thick yellowish brown coat along with the feelings of
balisters and burning sensation of stomach, hunger and nausea after eating. When urinary system was affected then thick mucous and bright red sediments present in urine along with stitching and crampy pains. It affects skin to express pimple, dryness, roughness, and scales. Scalp eruptions was spread to face and neck.[14]

**Homeopathic uses**

*Berberis aquifolium* is used homeopathically for removing pimples from the faces of girls. A remedy for the skin, chronic catarrhal affection, secondary syphilis, psoriasis, acne, dry eczema, pruritus, glandular induration, tumor of breast with pain, hepatic torpor, lassitude and other evidences of incomplete metamorphosis. It stimulates all glands and improves nutrition.[13]

**Relationship with other homeopathic medicine**

It can be compared with *Berb. v.*, *Euonym, Carbol.acid* and *Hydr.*[13]

**Biological activities**

Pharmacological researches showed that *Berberis aquifolium (Mahonia aquifolium)* have antibacterial, antifungal, anticancer, antioxidant and antiproliferative potentials.

**Antibacterial activity of Berberis aquifolium:** Isolated protoberberine alkaloid, berberine- a constituent of *Mahonia aquifolium* was investigated for antimicrobial potential against 17 microorganisms, bacteria such as *Escherichia coli* (both resistant and sensitive), *Zoogloea ramigera, Bacillus subtilis, Pseudomonas aeruginosa, Staphylococcus aureus* and, fungi such as *Aspergillus niger, Penicilium chrysogenum, Aureobasidium pullulans* (black and white strain), *Trichoderma viride* (original green strain and brown mutant), *Mycrosporum gypseum, Fusarium nivale*, yeasts such as *Saccharomyces cerevisiae* and *Candida albicans*. Among 17 microorganism, berberine possessed greater antimicrobial potential for *S. aureus* and lesser for *T. viride* G (green). Results expressed antimicrobial effects of berberine in order to *T. viride* G (green) < *P. chrysogenum* < *F. nivale* < *A. niger* < *M. gypseum* < *T. viride* Br (brown) < *A. pullulans* W (white) < *Pullulans* B (black) < *S.cerevisiae* < *C. albicans* < *Z. ramigera* < *B. subtilis* < *E. coli* R < *P. aeruginosa* R (resistant) < *E. coli* S < *P. aeruginosa* S (resistant) < *S. aureus*. [15]

**Antifungal approach of Berberis aquifolium:** In a research study, *in vitro* dilution agar plate method was used for evaluation of antifungal activity of crude extract of *Mahonia
**Aquifolium** stem bark and its major protoberberine alkaloids such as berberine, palmatine and jatrorrhizine against a range of dermatophytes and two *Candida* species of human origin. Results expressed that Jatrorrhizine possess greater antifungal potential against all tested fungal species as compared to crude extract, berberine, and palmatine which showed lesser potential.\(^{[16]}\)

Isolated bisbenzylisoquinoline alkaloid complex (BBI) and protoberberine alkaloids (major constituents berberine and jatrorrhizine) from crude extract of *Mahonia aquifolium* stem bark were evaluated for their antifungal potential against six strains of *Malassezia* spp. Results of this study expressed that tested isoquinoline alkaloids possess weak to moderate antifungal potential.\(^{[17]}\)

**Antitussive activity of Berberis aquifolium**

An acidic polysaccharide (AP) complex was isolated from *Mahonia aquifolium* (Pursh) stems by using ion-exchange and gel chromatography, for evaluation of its structural features and biological potential. On structural analysis, it was founded that acidic polysaccharide (AP) was a complex of two polysaccharide, xylan (4-O-methylglucurono) and pectin which linked closely. AP gave excellent antitussive results in cats, suffering from mechanically induced cough, as compare to other drugs used clinically.\(^{[18]}\)

**Antioxidant activity of Berberis aquifolium**

Three alkaloids berberine, jatrorrhizine, and magnoflorine were isolated from *Mahonia aquifolium* for evaluation of their structures, antiradical and antioxidant activities. DPPH method was used for finding antiradical activity of alkaloids and AAPH azoinitiator was used to induce peroxidative damage in heterogeneous membrane system of DOPC liposomes for testing the antioxidative activity of alkaloids. Jatrorrhizine and magnoflorine expressed greater results than berberine in both testing systems.\(^{[19]}\)

In a research study, crude extract of *Mahonia aquifolium* and its two fractions containing isoquinoline alkaloids such as protoberberine and bisbenzylisoquinoline (BBIQ) alkaloids were evaluated for its effects on 12-lipoxygenase inhibition through DPPH free radical scavenging method. In this mechanism of the enzyme inhibition by crude extract of *Mahonia aquifolium* and its constituents, lipid-derived radical scavenging was evaluated by using 1, 1-diphenyl-2-picryl-hydrazyl (DPPH). But enzyme was not inhibited by direct radical
scavenging mechanism. Lipoxygenase was inhibited due to interaction among enzyme and alkaloids.\textsuperscript{[20]}

**Berberis aquifolium for the treatment of psoriasis**

In a randomized, placebo-controlled clinical trial study, extract of *Mahonia aquifolium* bark was used to treat patients suffering from *Psoriasis vulgaris*. In this trial, 82 patients were asked to apply two types of ointment, one was verum (ointment containing 10% content of *Mahonia aquifolium* bark extract) and the other was placebo (ointment base), on alternate side of their body for four weeks. Among 82 patient, only 4 patients were suffered from adverse effects of verum such as burning sensations, allergic reactions and itching. So, this analytical study was evaluated the safety, efficacy and potential of the *Mahonia aquifolium* bark extract therapy for psoriasis vulgaris.\textsuperscript{[21]}

In a randomized, half side comparison study, proliferation and activation markers in psoriatic skin. Both tested drugs was applied on 49 patients with psoriasis for four weeks. Biopsies of tested areas were taken before and after tropical treatment for assessment of monoclonal antibodies such as anti-ICAM-1, CD3, HLA-DR, keratin 6, keratin 16, Ki-67. All antibodies were significantly reduced except Ki-67 in both treatment therapy at the end of therapies. *Mahonia aquifolium* was less efficient to improve cellular cutaneous immune mechanisms and hyperproliferation of keratinocytes in psoriatic skin than dithranol.\textsuperscript{[22]}

**Potential of Berberis aquifolium as anti-mutagenicity**

In another study, antimutagenic effects of crude extract from the bark of *Mahonia aquifolium* as well as its fractions was evaluated against a mutagen acridine orange (AO)-induced chloroplast mutagenesis of *E. gracilis*. The result of this study expressed that bisbenzylisoquinoline (BBI) and protoberberine alkaloid fractions from *Mahonia* extract inherent the anti-mutagenicity. But significant concentration-dependent inhibitory effect against direct-acting chemical mutagens was expressed by protoberberine derivatives, jatrorrhizine and berberine among both alkaloids fractions. Berberine showed greater potent antimutagenic or anticarcinogenic effects in low potency as compare to jatrorrhizine through the mechanism of inhibition of DNA topoisomerase.\textsuperscript{[23]}
REFERENCES


