

# NOVEL USES OF MAHONIA NEPALENSIS DC.: AN EXTRAPHARMACOPIAL PLANT OF AYURVEDA

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## Abstract

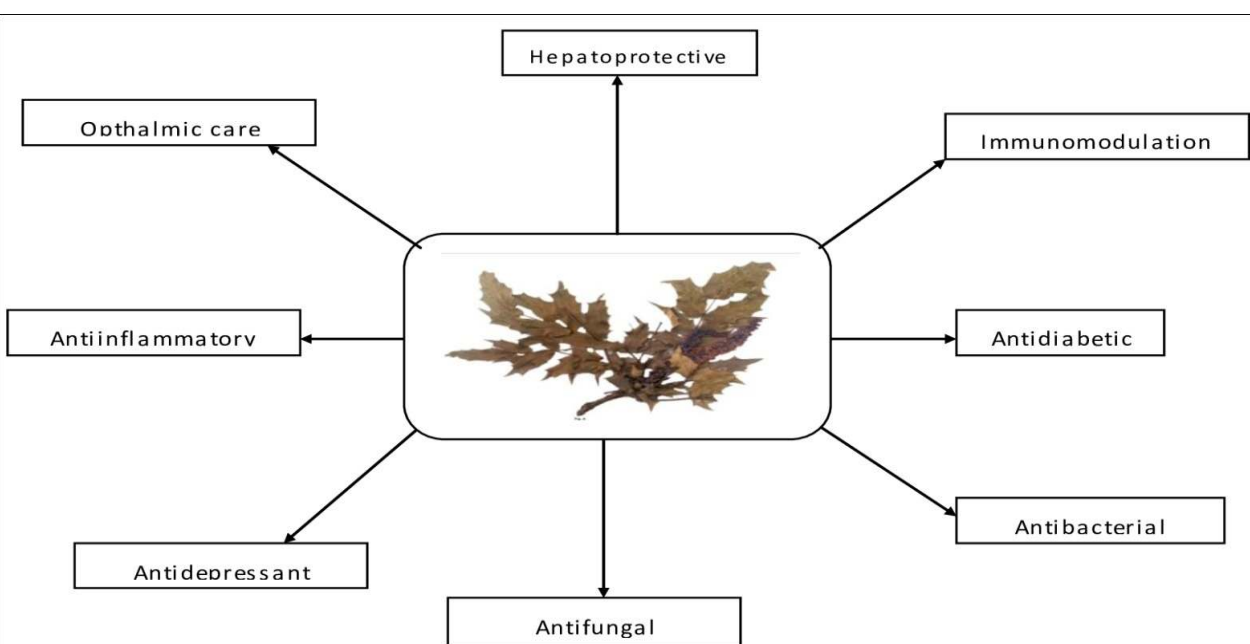
**Introduction-** *Mahonia nepalensis* DC. belongs to Berberidaceae family. In the Sikkim, West Bengal this plant is used in the alternative medicine system. It is found in the Temperate Himalaya, Altitude 4000-8000 ft. from Garwhal to Bhutan. It is commonly known as 'Mahonia'. In Nepali it is called as '*Jamanemandro*', *Mahonia nepalensis* DC. is an evergreen shrub, 1.2-3 m. high with sparingly branched erect stems up to 20 cm. diameter. *Mahonia nepalensis* DC. is used as in folklore medicine. **Methods-** This study is based upon survey for Ethno-botanical purpose, by the critical review of the *Mahonia* plant in the Alternative system of Medicine, Ethno-botanical study and novel use of the plant based upon the novel research technique and methods. **Results-** *Mahonia* is widely used as a hepatoprotective, used in skin diseases and treatment in diarrhea & Jaundice. This study was aimed to analyze its novel uses on the basis of modern scientific evidences. **Conclusion-** Berberidaceae family has diverse numbers of species. In *Ayurveda*, *Berberis aristata* DC. is used in the name of *Daruharidra*. *Mahonia nepalensis* DC. has similar properties that of *Daruharidra*. *Mahonia* is used in hepatic related problems, immunomodulation, antidiabetic, antibacterial, antifungal, antidepressant, anti-inflammatory, ophthalmic care. **Key Words-** *Mahonia nepalensis* DC., Hepatoprotective, Jaundice, Mahonia.

## Discussion

*Berberis napaulensis* (Syn. *Mahonia nepalensis* DC.) is belonging to Berberidaceae family. This is shrub or small plant having a compound leaflet. *Berberis napaulensis* is native to Kathmandu Valley. In short interview of villagers with our team shown that the plants were very much important for them from ethnomedicinal point of view. The beauty of flowers, the sweet berry and enormous medicinal values has related them together in this type of bounding.

Hamilton in his book: From the Kingdom of Nepal, 1856 first introduced *Jumne-mundroo* on p. 85. *Berberis (Mahonia) nepalensis*; properly as *Jamani mandru*. After that the study in this plant began worldwide and name changed according to new findings from as *Mahonia nepalensis* DC to *Berberis napaulensis* DC.

*Mahonia* has a potential action as antioxidant, anticancer, immunomodulatory, antidiabetic activities. However, these potencies of the plant show great importance in medicinal field but till, this plant is unknown for clinical study and unknown for trial in clinical point of view. This plant needs more exposure in different new emerging diseases day by day by clinical trial approach.



## Conclusion

During last some years back there has been increased consumption of medicinal plants in the market. The new technology is developing for the investigation of the chemical compound present in the plants. Folklore medicines have great importance in the society. They are related with spiritual values as well. This survey study is based on the documentation of ethno-medicinal values of *Mahonia nepalensis* and its uses documented it as form experimental and clinical approach. *Berberis aristata* DC. & {*Berberis napaulensis* (DC.) Laferr. (Syn. *Mahonia nepalensis* DC.)} have great ethnomedicinal values. In folklore medicine, these have been used in jaundice. Its bark juice is used in hepatic related diseases. This plant is known for botanists' since 18<sup>th</sup> century from Kathmandu Valley and Sikkim of West Bengal. This plant has hepatoprotective action against various liver-related problems. Experimental studies show that it shows antidiabetic and antioxidant properties.

## Introduction

Family Berberidaceae consists of erect shrubs or herbs. According to Adhikari (2010) and Mabberley (2008) Berberidaceae family includes 715 species within 14 genera. According to Whetstone et al. (1997) and Nickol (1995), Berberidaceae family has 15 genera with ca. 650 and 13 genera with ca. 570 respectively. *Berberis* and *Podophyllum* species are those species which are generally represented as Berberidaceae family in Nepal. Similarly, Ahrendt in 1961 and Adhikari in 2010[1], *Berberis* includes ca. 450 species with excluding *Mahonia* of ca. 100 and with including *Mahonia* more than 500 species correspondingly. *Berberis* is the largest woody plants in the Berberidaceae. *Mahonia* is compound leaved plant and *Berberis* has simple leaves[2]. There is no significant difference in chromosome arrangement in the plant genetic study, floral taxonomy of plant, seed germination and early growth morphology in between *Berberis* and *Mahonia*[3]. *Berberis* and *Mahonia* have close phylogenetic relationship. Marroquin & Laferriere in 1997 and Laferriere in 1997 transferred compound leaved *Mahonia* species to simple leaved *Berberis* species[4].

**Taxonomic Classification of Mahonia Nutt.**

**Kingdom-** Plantae **Phylum-** Tracheophytes

**Class-** Spermatopsida **Order-** Ranunculales

**Family-** Berberidaceae **Subfamily-** Berberidoideae

**Genus-** Mahonia

**Species-** *M. nepalensis* DC.

**Binomial name:** *Mahonia nepalensis* DC. Syn.

*Berberis napaulensis* (DC.) Laferr.

**Vernacular Name:** Nepali: *Jamanemandro*.

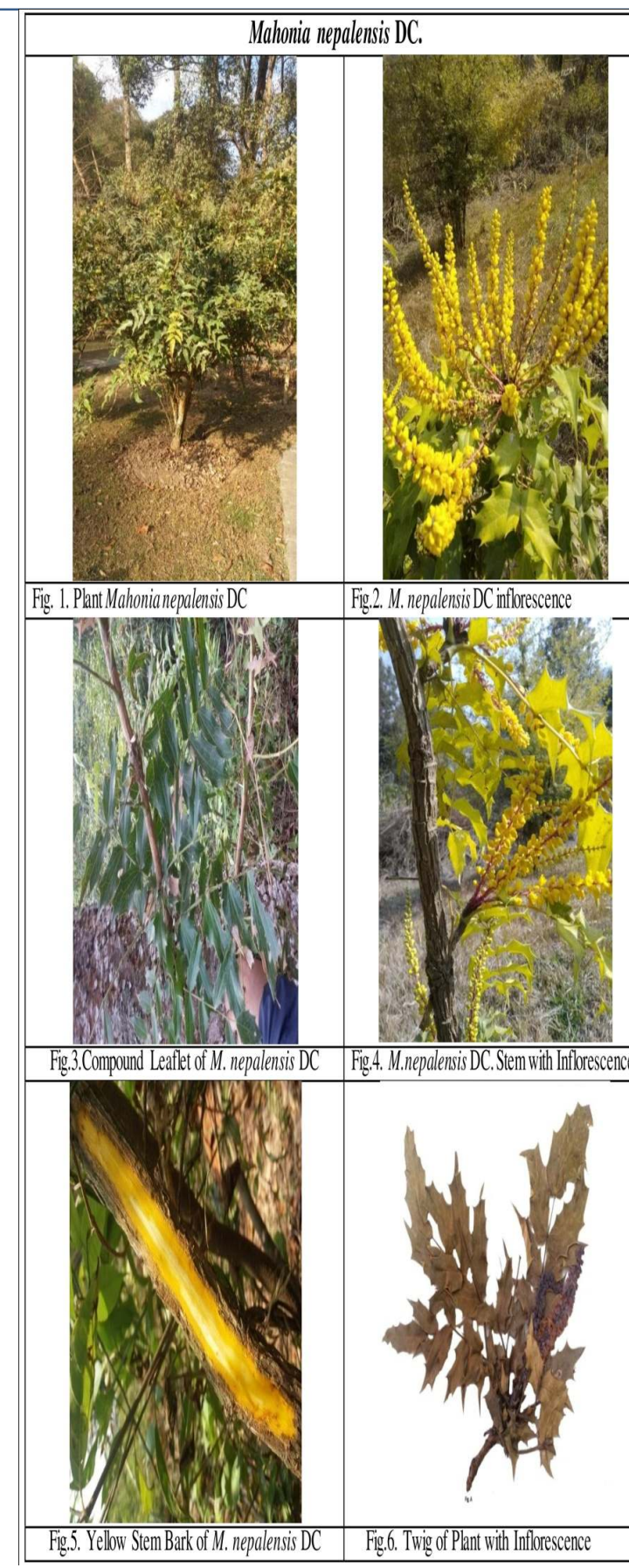
**English Name:** Mahonia, Nepal Barberry.

## Results

Infective hepatitis is the highly contagious disease that attacks hepatocytes of liver. *Berberis napaulensis* has berberine, jatrorrhizine, O-methyl puljabin. Berberine has properties of cholegogue, hepatostimulant and astringent and is useful in treating anorexia, dysentery and hepatitis. Berberine is the main chemical compound in this plant which inhibits in hepatoma cell line (HepG2), cholesterol and triglyceride synthesis. Experimental study of berberine on rat hepatoma H4IIE cells shows increased glucose consumption. In experimental observation, BBR prevents development of obesity in rat and also shows that insulin resistance activities in HFD-fed rats; reduces liver necrosis due to infection in liver both in nonalcoholic steatosis and steatosis. In elderly, increased cholesterol level statin-intolerant patients BBR reduces cholesterol (LDL-c) levels. Experimental trial in the STZ induced rat model, in the oral glucose tolerance test of methanol root extract and methanol stem bark extract of *Mahonia nepalensis*, have shown significantly lower blood glucose level value. After the survey study, it is found that the stem bark extract and dried root powder of *Berberis* are used in eye diseases. In traditional practices for diseases as jaundice, malaria and peptic ulcers *Berberis* stem bark is highly used. Berry fruits are used for making alcoholic drinks in high altitude as a beverage and fruits are eaten when ripe. "*Chutro*" in Nepali means all species of Berberidaceae family. *Mahonia nepalensis* DC wood bark decoction (15-20 ml) is prescribed two times daily for 15 days in case of jaundice by traditional health practitioners. The root stem and its bark are used as diuretic, demulcent and root as antiseptic.

## Materials and methods

The methods for the data collection of the uses of *Mahonia nepalensis* DC. was through the personal interview and group conversation with local inhabitants were conducted to gather information on ethnomedicinal values of plant from 15, 10, 10 and 10 householders from Chalnakhel and Champadevi; Shivapuri; Pulchoki and Sanga of Kathmandu Valley, Nepal respectively. Questionnaire asked for gathering information of the plants are location of plant, general identification features, local plant names, parts of the plant used, name of diseases that the plant is used for treatment, plant used as single medicine or as mixed with other plants, method of preparation, administration, quantity and frequency of use and this study is based on comparative survey study of Berberidaceae family plants over 30 herbarium specimens of KATH and on field visit study *Mahonia* in Kathmandu valley. The plants were collected from different regions of Kathmandu valley as from Bosan Forest; Chalnakhel, Dakshinkali Municipality; Shivapuri Nagarjun National Park, Shivapuri; Phulchoki, Godawari. Specimens were compared with herbaria of National Herbarium & Plant Laboratories (KATH) TUCH, KTM, Nepal and CSIR-NIScPR, New Delhi, India. In this study detail novel uses of *Mahonia nepalensis* DC were studied with ethno-medicinal uses of this plant. The ethnomedicinal values of the plants were collected from the villagers and a bibliographic investigation was done by analyzing articles, Google Scholar, PubMed, references books, peer-reviewed paper, worldwide accepted databases.



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