



Phytochemical and pharmacological profile of *Sambucus nigra*

Muhammad Faizan^{1*}, Farah Feroz²

¹Department of Chemistry, University of Management and Technology Lahore-54782, Pakistan

²Department of Chemistry, University of Lahore-54590, Pakistan

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Abstract

The plants are used to promote health and also used for the treatment of various diseases for mankind nowadays. But, the plant-based drugs which are recently identified or researched by the modern framework, are more reliable and beneficial for clinical use. The plant "Elderberry" (*Sambucus nigra*) is the best source to extract proteins and its extracts are being used for multi-purpose activities including treatment of cardiovascular diseases, good impact on the immune system, antitumor activity and are also used for UV rays protection, etc. A very simple and environmentally friendly method is applied for the synthesis of silver nanoparticles by using European black elderberry (*Sambucus nigra*). By this, the extraction of different fruits was developed. Thousands of plant species are growing worldwide which have medicinal use and contain different active constituents that have a direct effect or action on the human body. This article gives an overview of the key concepts based on the pharmacological profile of *Sambucus nigra*.

* Corresponding Author: Muhammad Faizan ✉ mfaizan.chemist@outlook.com

Introduction

Sambucus nigra is relevant to the family named Adoxaceae. Plants have a source of pharmacological activities for more than 4000 years. About an idea there are approximately 55% of medicines are formed by the plants (Abuja *et al.*, 1998). Since the time our old system of medicines is used in all the kinds of medicines successfully. There are different parts of the plant which are used including fruit, leaves and flowers to contribute to the extract and being a part of pharmacological activity (Barnes *et al.*, 2007). There are the leaves of *Sambucus nigra* which is shown in (Fig. 3) and the other parts of the plants are including fruits which are berries of *Sambucus nigra* shown in (Fig. 1). The dark or brownish seeds of *Sambucus nigra* which Extracts show the different pharmacological activities as shown in (Fig. 4).

The botanical version of plants

Leaves

Almost all the *Sambucus nigra* are evergreen but some of them are special which may lose their leaves in the autumn season. And the fruit of *Sambucus nigra* is usually cut off or crop out in October and then dried (Cejpek *et al.*, 2009). The leaves of *Sambucus nigra* are very thick and small in size and greenish in the usual atmosphere (Christensen *et al.*, 2008). The leaves are used in different pharmacological activities as anti-oxidant also. The leaves are mostly curved and 2.0-4.5cm long and have a smooth surface.

Flowers

The flowers of *Sambucus nigra* are reddish-brown and having numerous and stems of flowers that are 5-9mm long (Gray *et al.*, 2000).

The stem of the *Sambucus nigra* flowers is smooth as may leave. Stamens are many of them are thread-like, reddish-brown.

Fruit

The fruits of *Sambucus nigra* are blackberry having black color and the fruits are used for the extraction of different pharmacological active constituents. In different countries there is a large quantity of

materials is extracted from this plant. Some countries are grown elderberries on a large scale. The *Sambucus nigra* plant is prepared in almost 2 years and then able for the harvesting of fruit.

Seed

The seeds of the plant *Sambucus nigra* are many irregular and having sized up to 3mm long and dark brown. The growing time of seeds is the end of the September and start of the October then the seed is properly growing. In the south area of countries, the capability of seed growth is determined under temperature conditions below 10 Celsius (Groza *et al.*, 2011). The maximum seed maturation is at 15 Celsius in south countries.

Microscopic depiction and phytochemistry of plant

The constituents or different kinds of materials extractives in the methanol soluble solution of the acetonitrile is extracted from the *Sambucus nigra* fruit has been studied.

The Extracts of lipids and flavonoids are carried by the four different solid-phase extraction are studied. Overall these extractions are then totally analyzed by the HPLC (High-performance liquid chromatography) by using high-efficiency mobile phase and stationary columns. With the help of HPLC there are different mainly active constituents including flavonoids, hydrocarbons (Barak *et al.*, 2002), the sterol is studied under certain conditions of flow rate and temperature or polarity (Bratu *et al.*, 2012). All the analytes are then confirmed by comparing the peaks of retention time and their chromatograms with the standards and calculated by the calibration curves.

Pharmacological activities

Antioxidant potential

Elderberry is used to prevent oxidation and plays a vital role as an antioxidant active plant. The oxidant activity having ranges 83.01 to 90.13% of inhibition. These properties are present due to the phenolic compound which are attributes to their chemical composition (Ciocoiu *et al.*, 2012).

Table 1. A taxonomic account of *Sambucus nigra*.

Kingdom	Plantae
Order	Angiosperms
Family	Adoxaceae
Genus	<i>Sambucus</i>
Species	<i>S.Nigra</i>

Medicinal potential

Sambucus nigra plays a very hopeful role in different type of diseases and the effects of diseases on the human being. The flowers and fruit of *Sambucus nigra* are used in different types of diseases and these extracts are mostly used in medicines. First of all, Elderberries are commonly and primarily used in the symptoms of temperature, cough, etc. because in this plant different types of flavonoids are present which are used to kill out the primary bacteria of the problem (Dyumus *et al.*, 2014).

**Fig. 1.** *Sambucus nigra* berries.*Antibacterial activity*

The flowers and leaves of the berries are used as an antibacterial agent in bacterial activity. The extracts of flowers and blackberries are taken by methanol and then this extract including the active constituents of bacteria especially gram-positive bacteria which may cause the issue and effected the skin and the muscles of the cell are used. The extract of flowers and berries is used to kill the pathogens which may affect the skin or other tissues in this way this plant is used as antibacterial active (Mikulic *et al.*, 2012).

**Fig. 2.** Plant of *Sambucus nigra*.*Antiviral activity*

Sambucus nigra involving Rubini is used as an antiviral active compound. This activity may be checked out on to influenza which is a mankind pathogen (Mittal *et al.*, 2014). By the treatment, it makes sure that the active constituent which is used as an antiviral compound may kill the virus of influenza which is present in human beings. Elderberry may kill the virus which is harmful to mankind by the extraction of the plant and also prevent the virus. The results of this treatment showed that there is 100% prevention of virus may found when the Rubini is treated to the pathogens (Olejniket *al.*, 2016).

**Fig. 3.** Leaves of *Sambucus nigra*.*Diabetes dysfunction activity*

Elder is used as a diabetic remedy from ancient times and may prevent diabetes. This is used as a dietary

adjunct in the treatment of diabetes (Podoisky and D.K 2002). The method of treatment is that the elements which may dissolve in the water there are present in the flowers of elder by reaction with the glucose which may further promote insulin secretion (Gil-Izquierdo *et al.*, 2010). Due to the extract of Elder, there is no need to inject the insulin because due to the extract of Elder the glucose increased up to level. Due to this the *Sambucusnigrais* used for diabetes dysfunction.



Fig. 4. Seeds of *Sambucus nigra*.

Obesity and metabolic dysfunction activity

*Sambucusnigra*in some extracts are used in obesity and metabolic dysfunction activity. These Extracts are obtained by the Ethanol when the plant is treated with Ethanol then some of them extract is carried out and reduce the obesity and play a random role in the metabolic pathway of human being also as clinical medicine are used (Groza *et al.*,2010).

Antidepressant potential

*Sambucusnigra*evaluated theantidepressant activity by the treatment of a fast-swimming test in which the antidepressant active constituents of eldersare being used (J.Lee and C.E Finn 2007). After the test, there are good results of antidepressant activity of berry is shown. About a comparison, there is an active compound of antidepressants which is found in Elder (H.G Duymuset *al.*, 2014). The dosage of this compound is 1200mg/kg caused a very significant effect as compared to imipramine which is a very

strong antidepressant medication (E.p and Cherniack 2013).



Fig. 5. Stem of *Sambucus nigra*.

Antitumoractivity

Sambucus nigrais used as antitumor activity in the human blood system (Jovanovic *et al.*, 1994). The extracted active constituents of *Sambucusnigra* are used in the metabolic pathway of the blood circulation system and act as an anticoagulation effect in the blood by which the tumors may not be found in the blood circulation (Rice-Evans *et al.*, 1996). The Extracts of *Sambucusnigra*are also used as an anticoagulant agent which may Vitro in blood vessels (Taget *al.*, 1984).

Conclusion

The different results which are obtained from different treatments are showed that the *Sambucus nigrais* very useful against pharmacological activities. The basic method to treat these activities by the plant is by HPLC method which is the most reliable method against these performances. An appropriate and low-cost or more significant plant *Sambucus nigrawhich* may use as antioxidant, antibacterial, antiviral, antitumor activities.

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