



UNIQUE JOURNAL OF AYURVEDIC AND HERBAL MEDICINES

Available online: www.ujconline.net

Research Article

ECONOMIC AND ETHNO-MEDICINAL USES OF *JUGLANS REGIA* L. IN KASHMIR HIMALAYA

Ganie Aijaz Hassan*¹, Tali Bilal A¹, Butt Tariq Ahmad², Wani Sameena³ and Nawchoo Irshad A¹

¹Department of Botany, University of Kashmir Srinagar -1900 06

²RRIUM, Srinagar

³Department of School Education, J&K

Received 07-09-2013; Revised 06-10-2013; Accepted 04-11-2013

*Corresponding Author: **Aijaz Hassan Ganie**, aijazku@gmail.com

ABSTRACT

Recent emergence of herbal medicine, global economic crisis and intensifying biopiracy controversies have necessitated for an urgent need for documentation of the traditional knowledge. Present study revealed that *Juglans regia* L. has considerable ethno-medicinal properties and huge economic potential. The plant species is used to treat 17 different types of diseases. It was also observed that some plant parts are used to treat more than one disease; likewise more than one plant parts are used to treat a particular disease. The maximum number of diseases (9) is treated by fruit kernels followed by leaves. This knowledge could prove beneficial in phyto-pharmacological research for the discovery of new therapeutic drugs and different industries.

Keywords: Herbal Medicine; Biopiracy; Economic Potential; Phyto-Pharmacology; Therapeutic Drugs.

INTRODUCTION

The family Juglandaceae consists of seven genera comprising about 60 monoecious tree species. The genus *Juglans* contains about 20 species, all producing edible nuts. Among those, the English or Persian walnut (*Juglans regia* L.) is the most widely cultivated species¹. The natural range of *Juglans regia* is confined to the Asian continent extending across twenty one modern political boundaries: from Turkey, Azerbaijan, Armenia, Russia, Georgia and Iraq (Kurdistan) in the west, across the northern lands of Iran and Afghanistan and the heart of central Asia in the newly independent states of Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan and their giant neighbour China in the Xinjiang Autonomous Region, formerly 'Chinese Turkestan', extending further south in a narrowing range nestling in the mountains of Pakistan, northern India and Nepal, and finally reaching its eastern extent in Bangladesh, Myanmar (Burma), Bhutan and southern China²⁻⁸, Jalas and Suominen⁹ and Tutin *et al*¹⁰, believe that *J. regia* may be native to Greece and elsewhere in the Balkan Peninsula. In India, only the state of Jammu and Kashmir is considered as hub for walnut production. The plant species has economical, nutritional values and medicinal properties¹¹. The walnut fruit industry is the backbone of the economy of the state of Jammu and Kashmir as its cultivation is directly connected to economic property of the people living in remote

areas. Walnuts are included in FAO list of priority plants because of its nutritive value¹². Walnut of Kashmir is exported to more than 49 countries with the annual earnings of more than 543 crores and annual production of 3, 73,474 M tones. Keeping in view the immense importance of this valuable plant the studies on its distribution, economic significance and ethno-medicinal uses has been undertaken.

MATERIALS AND METHODS

The valley of Kashmir is situated in northern fringe of the Indian sub-continent between 33°22' and 34°50' N latitudes and 73°55' and 73°33' E longitudes covering an area of about 16,000 sq. km. Field surveys and structured interviews were carried to elicit secret knowledge from locals inhabiting inaccessible areas of the region. Field surveys were conducted across the Jammu and Kashmir state during 2011-2013. Appropriate methodology was followed during the present study; usually the survey in each locality started with the interview of elderly and experienced members, locally known as "Hakeems". Besides this, common people of the surveyed localities who have used this plant species have been interviewed. The information regarding the economic value of the plant species was also gathered from local inhabitants. All the gathered information, in particular the part(s) used, method of preparation, method of use and dosage was recorded in

detail. To bring element of accuracy, the information obtained from one locality was cross checked with that of others.

The study system is a tree up to 25 m in height; leaves compound bearing 5-9 leaflets; male flowers are drooping catkins, 5–10 cm long, female flowers are terminal in 2-5 clusters; fruit drupe with a fleshy pericarp and a bonny endocarp that encloses the 2 edible cotyledons-Kernels (Fig.1)



Fig.1: Tree of *Juglans regia*

RESULTS

Distribution

The present study revealed that *Juglans regia* L. is cultivated in all the three regions (Kashmir valley, Jammu and Ladakh) of Jammu and Kashmir State. The species is cultivated in all the districts of Kashmir valley, in some areas of Kargil of Ladakh region and in Kishtiwari and some parts of Ramban, Udepur, Poonch and Rajouri areas of Jammu division.

Economic importance

Each part of the species is of commercial use, the kernels have high demand in national and international dry fruit markets. On an average 15-20kgs of kernels are obtained from 40kgs of dried fruits. The creamish colour kernels are sold at the rate of Rs.700-1000/kg. The black colour kernels are not edible; however, cooking oil is extracted from such kernels in Kashmir valley. Mature Walnut tree yields 2-5quantal of fruits. The kernels are also used in confections, cakes, ice cream etc. The dye is obtained from the epicarp of fruit to colour the woolen blankets and a local woolen dress used during winters known as “Pharan”. The dye is also used in polishing the walnut furniture. After cracking the fruits to separate the kernals, the stoney endocarp is used as fuel for domestic purposes and also in brick-kilns. The timber of walnut is of craze in Kashmiri wood carving, the wood of walnut is dark brown in colour, durable and lustrous.

Ethno-medicinal uses

Present study revealed that almost all the parts of the species are used in the folklore medicine in Kashmir Himalaya (Table 1).

Table 1: Ethno-medicinal uses of *Juglans regia* L. in Kashmir Himalaya

| Part used | Use/Uses | Method of preparation | Dosage |
|--------------|-------------------|--|--|
| Leaves | Mosquito replant | The fresh leaves are used for this purpose. | The fresh leaves are kept inside houses and cowsheds. |
| | Itching | 500gms of fresh leaves are boiled in 4-5 liters of water. | The affected body parts are washed by this water. |
| | Lice killer | Fresh leaves (500gms) are boiled in 4-5 liters of water. | The water is used to wash the hairs. |
| | Chronic dysentery | 5-10gm of fresh leaves are boiled in 2 liter of water. Indian Plantago seeds are added to the decoction after cooling. | 3-4 tsf of mixture is given thrice a day. |
| | Frost bite | 200gms of leaves are boiled in 3liters of water. | The affected body parts are washed with the mixture at bed time. |
| Fruit kernel | Brain tonic | 5gms of fruit kernel are boiled in 300ml of milk for 10 minutes and little honey or sugar is also added. | The mixture is orally taken early in the morning. |
| | Aphrodisiac | The kernels of fruits(30gms)and poppy seeds (5gm) are boiled with salt tea (500ml) for 10 – 20 minutes. | The tea is taken twice a day. |
| | Constipation | 5gms of fruit kernel are boiled in 300ml milk for 10 minutes and sugar is added to the mixture. | The mixture is taken orally at bed time. |
| | Dandruffs | The oil is extracted from kernels. | The oil is applied on the hairs once a day. |
| | Rheumatism | The oil of kernel is warmed. | The warm oil is applied on affected body parts. |
| | Muscular pain | Oil extracted from kernel. | The oil is massaged particularly on painful limbs. |
| | Improve eye sight | 5-10gms of fruit kernel are boiled in 300ml of milk. | The mixture is taken orally at bed time. |
| | Against cold | 5gm of fruit kernel is added to cinnamon and liquorice (5gm each). The mixture is boiled in water and | Tea is taken orally 2-3 times a day. |

| | | | |
|------------------------------------|----------------------------|--|---|
| | | prepared in the form of tea. | |
| | Memory enhancer | The fruit kernel (5gm) is boiled in mixture of milk and sugar. | The mixture is taken early in the morning. |
| Roots | Hair fall | The tender roots are kept inside bottle containing mustard oil under soil for 2- 3 months. | The oil is used to massage hairs once a day. |
| Root bark, leaves and twigs | Tooth ache and tooth decay | Fresh parts are cut into small pieces. | The cut pieces are chewed usually early in the morning. |
| Root bark, leaves | Antiseptic | The root bark and leaves are ground and made into paste. | The paste is applied on the wounds as antiseptic. |
| Fruit cover (Epicarp) | To heal the wounds | The fruit cover is crushed and mustard oil is added. | The mixture is directly applied on the wounds. |

DISCUSSION

The present study revealed that the plant species has wide distributional range in Jammu and Kashmir. The walnut stands second after apple industry in the state, giving employment to about 50,000 people. This tree species is a prized plant and each part has economic value and very little attendance is needed for its cultivation. The tree is resistant to diseases and generally no pesticide is used for the protection of this plant species.

During the present study it was observed that almost all parts of the plant species are used to treat various diseases. *Juglans regia* is used to treat 17 different types of diseases; in addition the leaves are also used as mosquito repellent. During the present investigation it was also observed that some plant parts are used to treat more than one disease; likewise more than one plant parts are used to treat a particular disease. The maximum number of diseases (9) is treated by fruit kernels followed by leaves (Fig.2).

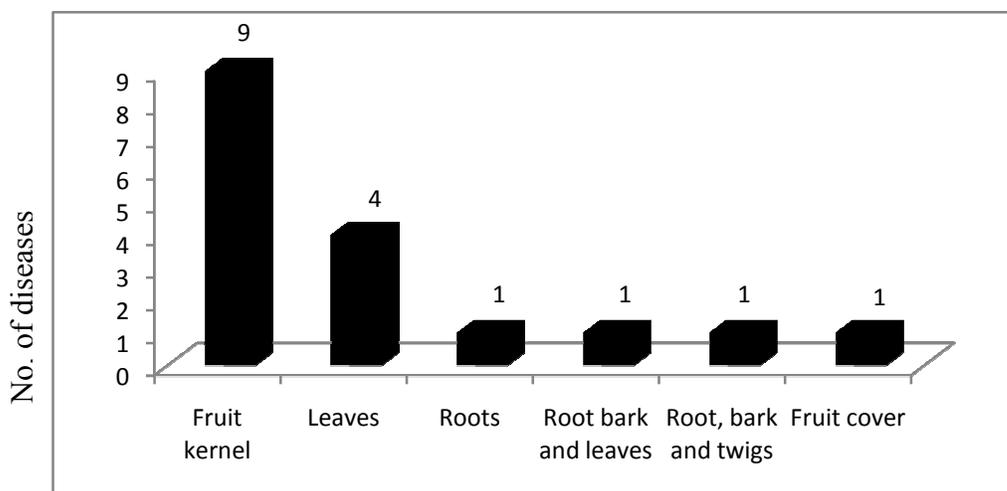


Fig.2: Different plant parts used to treat various diseases.

Ethano-botanical knowledge is very important as it reflects the practices and problems solved by the indigenous communities by their long experience. It also provides valuable baseline information for the commercial exploitation of bioresources. This information could be useful for the industry, pharmacologists, physicians, phytochemists, botanists and alike interested in the development of alternative therapies¹³. This secret treasure of knowledge could prove beneficial in phyto-pharmacological research for the discovery of new therapeutic drugs^{14, 15}. Also the growing concern among the developing countries about the emerging threats of biopiracy and intensities of IPR controversies are increasing day by day¹⁶. Thus the need of the hour is to speedily document this valuable information of ethno-botany and economic importance of this valuable plant species.

CONCLUSION

The present study revealed that *Juglans regia* has immense economic and ethano-medicinal importance, the knowledge could prove beneficial in phyto-pharmacological research for the discovery of new therapeutic drugs and useful for different industries which will lead to improvement of economy of the state.

ACKNOWLEDGEMENTS

We are highly thankful to the Head, Department of Botany, University of Kashmir, Srinagar, for providing necessary facilities. Authors highly acknowledge the corporation provided by the traditional knowledge holders and local inhabitants. Authors also acknowledge UGC-New Delhi for financial assistance under Special Assistance Programme (SAP).

REFERENCES

1. Mc Granahan, GH. & Leslie C, 1990. Walnuts (*Juglans*). Acta Horticulturae 290: 905–951.
2. Nekrassowa, VL. The genus *Juglans* in Turkestan. *Bulletin of Applied Botany, of Phytogeography and forest conservation*. Oxford & IBH Publishing Co., New Delhi 1927.
3. Schmucker T. The tree species of the northern temperate zone and their distribution. *Silvaeorbis* 4. Berlin-Wannsee, Berlin, 1942.
4. Berg LS. *Natural regions of the U.S.S.R.* Macmillan Company, New York, 1950.
5. Browicz K. *Juglandaceae*. In *Flora Iranica* 1976; 121. (ed. K.H. Rechinger), pp. 1-5. Akademische Druck-u Verlagsanstalt, Austria.
6. Davis PH. Flora of Turkey and the East Aegean islands, 1982; 7: 654. Edinburgh University Press, Edinburgh.
7. Puri GS, Meher-Homjii, Gupta RK., and Puri S. *Forest Ecology*, Vol. 1: Phytogeography and forest conservation. Oxford & IBH Publishing Co., New Delhi, 1983.
8. Komarov VL. *Flora of the U.S.S.R.*, Vol. 5.(197-199). Koeltz Scientific Books, Germany, 1985.
9. Jalas J, and Suominen J. Atlas Florae Europaeae, Vol. 3. The Committee formapping the Flora of Europe, Helsinki, 1976.
10. Tutin TG, Burges NA, Chater AO, Edmondson JR, Heywood VH, Moore DM. *Juglandaceae*. In Flora Europaea, (2nd edn.) Vol. 1.(ed. D.M. Moore). Cambridge University Press, Cambridge.
11. Khan SA, Bhatia S and Tripathi N. Entomological Studies of *Chaetoproctaodata*, An Important Pest on Walnut Trees (*Juglans regia* L.) in Kashmir Valley. *Journal of Academia and Industrial Research*, 2013; 2(6): 378-381.
12. Gande S. Budding and grafting of the walnut (*Juglans regia* L.) and their effectiveness in Bulgaria (Review). *Bulgar. J. Agri. Sci.*, 2007; 13: 683-689.
13. Ganie AH, Tali BA and Rather AM. An Ethnobotanical study in Budgam district of Kashmir valley: an attempt to explore and document traditional knowledge of the area. *International Research Journal of Pharmacy*. 2013; 4(1): 201-204.
14. Cordell GA. Biodiversity and Drug Discovery; A symbiotic relationship. *Photochemistry*, 2000; 55: 463.
15. Dhar U, Rawal RS and Upreti J. Setting priorities for conservation of medicinal plants – a case study in the Indian Himalaya. *Biol. Consev*, 2000; 95: 57.
16. Malik AK, Khuroo AA, Dar GH and Khan ZS. Ethnomedicinal uses of some plants in the Kashmir Himalaya. *Indian Journal of Traditional Knowledge*, 2011; 10(2): 362-366.

Source of support: Nil, Conflict of interest: None Declared