International Journal of Enhanced Research in Science, Technology & Engineering
ISSN: 2319-7463, Vol. 11 Issue 11, November-2022, Impact Factor: 7.957

Gymnema sylvestre (retz.) R.Br. e*x* Sm.– Gurmar: A Potential Ethnomedicine Of Sonbhadra District, Uttar Pradesh, India

Dr. Swati Chaurasia

Associate Professor, Department of Botany, DDU Government Degree College, Saidabad, Prayagraj, UP

ABSTRACT

There has been extensive demand of plant based medicines in India as nature has bestowed the country with enormous wealth of medicinal plants. Sonbhadra district of Uttar Pradesh is rich in biodiversity and is treasure of ethnomedicinal information provided by aborigines, natives and locals. The present paper deals with some useful ethnomedicinal information of *Gymnema sylvestre*(Retz.)R.Br.*ex* Sm-Gurmar practiced by the tribes. In India it is an endangered plant and listed as vulnerable in Sonbhadra and Chattisgarh. It is rich in secondary metabolite gymnemic acid which contributes to its medicinal potential.

Key Words: Biodiversity, endangered, ethnomedicine, gymnemic acid.

INTRODUCTION

India is referred as medicinal garden or botanical garden of the world. It is one of the 17 megadiverse countries in the world, and has four major biodiversity hotspots: the Himalayas, the Western Ghats, the Indo-Burma region, and the Sundaland (Andaman and Nicobar Islands (Venkataraman & Chandrakasan, 2018). To exploit the economic potential of biodiversity ethnobotanical and floristic surveys have been conducted by many workers in India (Srivastava, 1955; Bhattacharya, 1963, 1964; Jain *et al*, 1991; Singh *et al.*, 2002; Narain and Singh, 2006; Narayan and Singh, 2017). In Uttar Pradesh state of India, Sonbhadra district is also known to have very rich flora of medicinal plants. It occupies the southernmost part of Uttar Pradesh, surrounded in North by Mirzapur and Varanasi districts of U.P., in South by Surguja district of Chhattisgarh, in South-East by Palamu district of Jharkhand. The district lies in Vindhyan plateau between 23◦45’ to 24◦34’N latitude and 82◦45’ to 83◦23E longitude. The elevation above the mean sea level ranges between 315m to 485m (Singh and Singh, 1992). The tribal inhabitants of this study area are Agaria, Baiga, Bhuiya, Bhuniya, Chero, Gond, Dhuria, Ojha, Kharwar, Pankha, Nayak, Pathari , Raj Gond, and Pataria (Singh *et.al*., 2002). These tribals depend primarily on plants of their surroundings to treat their ailments. *Gymnema sylvestre* (Gurmar), a medicinally important plant found in Sonbhadra, rich in phytochemicals such as alkaloids, flavonoids, carbohydrates and phenols, is considered as an endangered plant (Khana & Kannabiran, 2007; Dere *et al*., 2017;). Its decline is primarily attributed to over-exploitation for medicinal purposes, habitat loss, and fragmentation of wild populations. Because of increasing human population and anthropogenic activities species extinction rate has increased which may also lead to sixth mass extinction crisis (Shivana, 2020).

MATERIALS AND METHODS

This study is based on systemic literature review (SLR) method and primary data were collected through different search engines such as Google Scholar, Elsevier, Springer, Research Gate and Science Direct up to the year 2023. All citations are from published journals.

RESULT

Gymnema sylvestre is a plant with a long history of use in traditional system of medicines (Gupta *et al.*, 2012). *Gymnema sylvestre* belongs to Asclepiadaceae (APG-Apocynaceae) contain potential secondary metabolite Gymnemic acid (GA) (a triterpenoid saponin), with nephroprotection, hypoglycemia, antioxidant, antimicrobial, and anti-inflammatory properties (Al-Khayari *et al.*, 2023). Ethnomedicinal information of Gurmar is given below in tabulated form:

S.No.	PROPERTY	SECONDARY METABOLITE	ETHNOMEDICINAL INFORMATION
1.	Antidiabetic	Gymnemic acid, gymnema, saponins, gurmarin (Kang *et al*., 2012)	Extract of leaf and stem is given empty stomach in morning for one month.
2.	Antiarthritic	Saponin glycosides (Malik *et al*., 2010)	The paste of stem is applied on affected part of body which give relief in pain.
3.	Antimicrobial/ Antibiotic	Gymnemic acid (Arunkumara *et al.*, 2023)	Leaf paste is given after three meals for relief in fever.
4.	Anti-inflammatory and antioxidant	Gymnemic acid, Gymnemasaponins, Gymnemoside, Gymnemasin, Quercetin, and long fatty acids (Jangam *et al*., 2023).	Extract of leaves are used.
5.	Anti-obesity	Gurmarin peptide (Preuss *et al.*, 2004)	GS whole extract powders are used.

CONCLUSIONS

Ancient traditional medicine is gaining large importance nowadays. WHO estimates 75-80% of people rely on alternative medicines which are plant based for primary health care because they found this more cost effective and easily available in rural areas with no side effects. As per latest report India is the diabetes capital of the world with 40 million people suffering from the disease. Ethnomedicinal information provided by aborigines suggests that *Gymnema sylvestre* is an important medicinal plant with anti-diabetic and other therapeutic potential. But since it is categorised as an endangered plant, it is prioritized for conservation by National Medicinal Plant Board, New Delhi.

REFERENCES

[1]. Al-Khayri, J.M., Sudheer, W.N., Banadka, A., Lakshmaiah, V.V., Nagella, P., Al-Mssallem, M.Q., Alessa, F.M., & Rezk, A.A. (2023). Biotechnological approaches for the production of gymnemic acid from *Gymnema sylvestre* R. Br. *Applied Microbiology and Biotechnology*, 107(14): 4459-4469.

[2]. Arunakumara, K., Walpola, B., & Faiz, M. (2023). *Gymnema sylvestre* R. Br. Ex Roemer and Schultes; A Review with special reference to conservation through propagation. *Journal of Natural and Applied Sciences Pakistan*, 5(2): 1465-1478.

[3]. Bhattacharya, U.C. (1963). A Contribution to the Flora of Mirzapur-I Some new records for Upper Gangetic Plain. *Bull.Bot. Surv. Ind.* 5(1): 59-62.

[4]. Bhattacharya, U.C. (1964). A contribution to the flora of Mirzapur-I. *Bull.Bot.surv. Ind.*, 6(2-4): 191-210.

[5]. Dere, S., Pawar, S., Pawar, B., Jambhale, V., Khandagale, V., & Jadhav, A. (2017). Development of in vitro regeneration protocol for *Gymnema sylvestre*: An Endangered Antidiabetic Medicinal Plant. *Plant Cell Biotechnology and Molecular Biology*, 18(7&8): 343-347.

[6]. Gupta, P., Ganguly, S. & Singh, P. (2012). A miracle fruit plant- *Gymnema sylvestre* R. Br. (Retz). Pharmacie Globale (IJCP), 3(12): 1-8.

[7]. Jain, S.K., Sinha, B.K., & Gupta, R.C. (1991). Notable Plants in ethnomedicine of India. Deep Publications, New Delhi.

[8]. Jangam, A., Tirunavalli, S.K., Adimoolam, B.M., Kasireddy, B., Patnaik, S.S., Erukkambattu, J., Thota, J.R., Andugulapati, S.B., & Addlagatta, A. (2023). Anti-inflammatory and antioxidant activities of *Gymnema sylvestre* extract rescue acute respiratory distress syndrome in rats via modulating the NF-κB/MAPK pathway. *Inflammopharmacology*, 31(2): 823-844. doi: 10.1007/s10787-022-01133-5.

[9]. Kang, M.-H., Lee, M.S., Choi, M.-K., Min, K.-S., & Shibamoto, T. (2012). "Hypoglycemicactivity of *Gymnema sylvestre* extracts onoxidative stressand antioxidantstatus indiabetic rats," *Journalof Agricultural and Food Chemistry*, 60(10): 2517–2524,

[10]. Kant, S., & Pandey, S. (2021). Survey of Ethno medicinal Plants used by tribal people of Sonbhadra district, Uttar Pradesh, India. *International journal of humanities, engineering, science and management*, 2(02): 56-67.

[11]. Khana, V.G., & Kannabiran, K. (2007). Larvicidal effect of *Hemidesmus indicus, Gymnema sylvestre* and *Eclipta prostrata* against *Culex quinquefasciatus* mosquito larvae. African Journal of Biotechnology, 3: 307-311.

[12]. Malik, J.K., Manvi, F.V., Nanjware, B.R., Dwivedi, D.K. , Purohit, P, & Chouhan, S. (2010). "Anti-arthritic activity of leaf of *Gymnema sylvestre* R.Br. leaves in rats." *Der Pharmacia Lettre*, 2: 336–341.

[13]. Narain, S. & Singh, J. (2006). Contribution to ethnobotanical plants of Sonbhadradistrict , U.P. *J.Econ. Tax. Bot.*, 30: 18-20.

[14]. Narayan, D., & Singh, P. K. (2017). Ethnobotanical importance and herbal medicine in Vindhya region of Eastern Uttar Pradesh, India. *Journal of Medicinal Plants Research*, 11(25), 403-413.

[15]. Preuss, H.G., Bagchi, D., Bagchi, M., Rao, C.V.S., Satyanarayana, S., & Dey, D.K. (2004). Efficacy of a novel, natural extract of (–)-hydroxycitric acid (HCA-SX) and a combination of HCA-SX, niacin-bound chromium and *Gymnema sylvestre* extract in weight management in human volunteers: a pilot study. *Nutrition Research*, 24(1): 45-58. https://doi.org/10.1016/j.nutres.2003.09.007.
[16]. Shivana, K.R. (2020). The Sixth Mass Extinction Crisis and its Impact on Biodiversity and Human Welfare. *Springer Nature*, 25: 93-109.
[17]. Singh A.K., Raghubanshi, A.K., & Singh, J.S. (2002) Medico-ethno botany of tribals of Songhati of Sonebhadra district, Uttar Pradesh, India. *Journal of Ethno Pharmocology*, 81(1): 31-41.
[18]. Singh, J.S. and Singh, V.K.1992. Phenology of seasonally dry tropical forest. *Curr. Sci.*, 63: 684-688.
[19]. Srivastava, J.G. 1955. A note on the flora of Mirzapur (U.P.). *J. Bombay Nat. Hist. Soc.*, 53: 152-153.
[20]. Venkataraman, K. & Chandrakasan, S. (2018). Biodiversity Hotspots in India. doi: 10.1007/978-981-10-6605-4_1.