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Ethnomedicinal study of plants used to cure skin diseases and healing of wounds in Gulmarg Wildlife Sanctuary (GWLS), Jammu & Kashmir

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Gulmarg Wildlife Sanctuary (GWLS) hosts large number of medicinal plants and is a rich repository of indigenous knowledge and practices. In present day scenario such indigenous knowledge is disappearing in new generations day by day with the advent of modernization. Therefore, an effort has been made to document the aboriginal uses and practices of plants utilized by the local inhabitants of Gulmarg Wildlife Sanctuary (GWLS), to treat skin related problems and help in wound healing. A total of 33 plant species belonging to 31 genera and 26 families are used indigenously to cure various skin diseases/wound healing. 22 plant species are non-native and 11 species are native to the Himalayan region. Various plant parts of these species are used to cure aforesaid diseases. Further, such studies would assist in developing a comprehensive database of plant used in various traditional medicinal systems or strengthening the healthcare in the rural ecosystem and also help in conserving the traditional knowledge and practices for posterity.

Keywords: Dermatitis, Ethnomedicinal, Gulmarg wildlife sanctuary, Skin disease, Wound healing

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Since time immemorial, herbal remedies for treating various ailments have been in fashion in all human social orders. Further, concept of herb based medicine is also witnessing a revival in the development of societies, along with other traditional medicinal systems. Ethnobotanical research have led to the discovery of many novel drugs and helped a lot in modern day drug development[1]. Ethnobotanical information regarding the utilization of plants for healthcare by tribal people is useful not only in healthcare practice and management but also in species conservation[2]. Traditional medicine is dependent on available plant resources and capitalizes a long-established wisdom- storehouse of knowledge[3]. The valuable information of medicinal plants has been assembled in the course of many centuries based on different Indian systems of medicines[4]. Rig - Veda and Atharveda and several post Vedic treatise, like Charakasamhita and Dhanwanthari Nighantu, which are the significant ancient credentials on medicinal plants[5].

Jammu and Kashmir, situated in the lap of the Himalaya recognized as paradise on earth and hosts plethora of floral and faunal diversity[6]. Kashmir Himalaya hovering at the Northwestern tip of the Himalaya and hosts magnificent biodiversity of great scientific inquisitiveness and national significance. The Himalayas spreading over an area of 7, 50, 000 sq. km harbors about 10,000 plant species; interestingly, the Kashmir Himalaya alone harbors near about 2,000 of the plant species within just 2.15% of the total land area[7]. From ancient times, Kashmiris are admiring the plant resources for various purposes like health care and food, which is also mentioned in Kalhana's Rajtarangini (1149-50 AD). Several ethnobotanical studies have been carried out throughout the Kashmir Himalaya[8-40]. But most of the studies have been carried out for general assessment and documentation of medicinal plants. A very few studies have been conducted on medicinal uses of the plants used to cure skin diseases. Till date, no such kind of study has been carried out by any of the worker in the GWLS of Kashmir Himalaya. Therefore, the study has been conducted in the GWLS (74°.17' to 74°.79' N latitude and 34°.55' to 34°.60' E longitude) of Kashmir Himalaya, J&K to compile the traditional knowledge/indigenous practices used to cure skin related problems.

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Material and methods

Study area

GWLS falls 26 kms to the Southwest of district Baramulla of J & K, stretching between 74°.17' to 74°.79' N latitude and 34°.55' to 34°.60' E longitude at an altitude of 2400-4300 m, divided into 27 compartments numbered from 31–58 (Fig. 1). GWLS was proposed to be a biosphere reserve in 1981, but that did not worked out, so the department of the wildlife protection declared it as a sanctuary in 1987 (*Notified vide S.R.O.147, Dated: 14-03-1987).* The total area of the GWLS is 180 sq. km which covers the top catchment of Ferozpur Nallah and forests surrounding the Gulmarg, bowl. The area is surrounded in North by Jhelum valley forest division-Baramulla, South by forest division of Poonch and Pir-Panchal. East is flanked by village of Drang and Badrakoot forests of Special forest division-Tangmarg and on the West by special forest division Tangmarg and Baba Reshi, village, GWLS is home to various ethnic nomadic tribal groups like Gujjars and Bakerwals. The traditional attire of the people of Gulmarg, with intricate designs and embroidery, reflects the rich culture, the landscape type and the climate of the region.

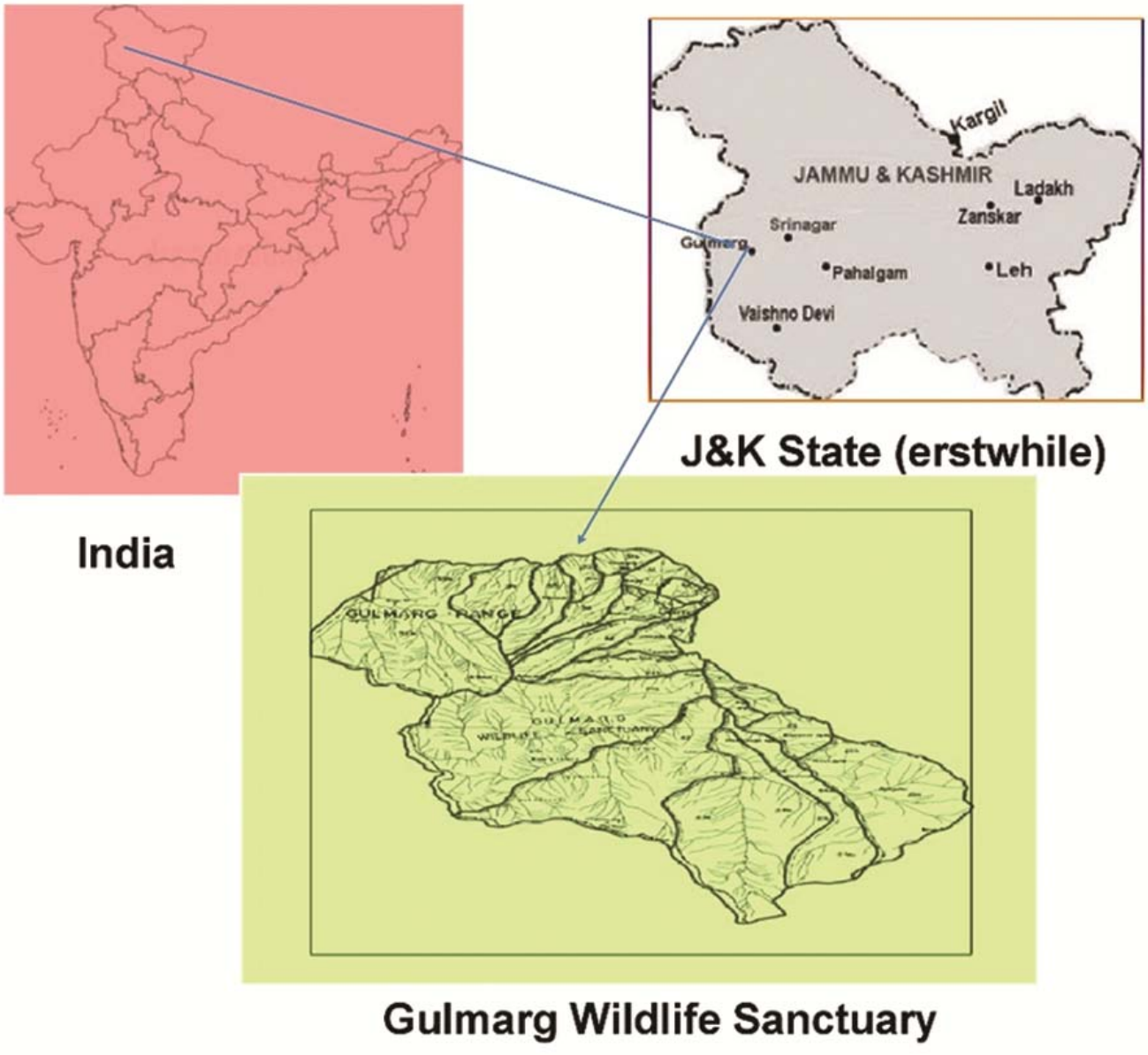

Fig. 1 — Map of the study area

Data collection and analysis

The present study is based on the in-depth survey conducted in the GWLS in the year 2018. The information regarding the ethnomedicinal plants used for curing various skin diseases and healing of wounds was collected from the local communities through personal interviews and discussions. Semi structured open ended questionnaires were used for the collection of data. Local healers (*Hakeems*) of the area were also consulted regarding the traditional/indigenous practices. Samples of the species were collected and identified with the help of related papers and floras[41,42]. The mounted specimens were deposited in the herbarium of Department of Botany, BGSB University, Rajouri. Nativity of the plant species was identified through relevant literature[43,44].

Result and discussion

Study recorded 33 plants belonging to 31 genera and 26 families within different life forms, i.e., trees (06 species), shrubs (01 species), herbs (26 species) (Fig. 2). The species grows over wide ranges of altitude which ranges from 1600–3500 m. Thirty one species are found between 1600–2600 m while 15 species are found at an altitudinal range of >2600–3500 m. These species were used by the inhabitants for curing skin related problems/diseases (Fig. 3). The use pattern of the species indicated that fruits, seeds, roots, leaves or whole plants are used (Fig. 4). The aboriginal uses and applications of the species used in curing skin diseases and healing of wounds are presented (Table. 1). Only eleven species are native to the Himalayan Region while 22 species are non – native (Fig. 5). The non native species have been introduced for different purposes like food (08 species), horticulture (04 species), plantation (01 species), ornamental (02 species) or have been introduced unintentionally (07 species) (Fig. 6). Further, analysis indicated that out of thirty three species, 19 are reported from the wild and remaining from cultivated areas**.**

Present study provides ethnobotanical uses and traditional/aboriginal procedures of the plants used to cure skin related problems and healing of wounds in GWLS (Fig. 7 a-i). According to a report, approximately 80% of whole world population depends on the long-established system of healthcare[44] and relies on the use of plant and plant products[46], as it has long tradition and wide recognition and reliability. The local inhabitants of the GWLS used these species traditionally to cure various skin related problems. Further, different plant parts are used in different proportions to cure skin related problems. But, fortunately in these days such practices are getting a great attention due to the concept of green/herbal medicine, as they have no side effects. Therefore, there is a pressing need to document such kind of information in order, as this

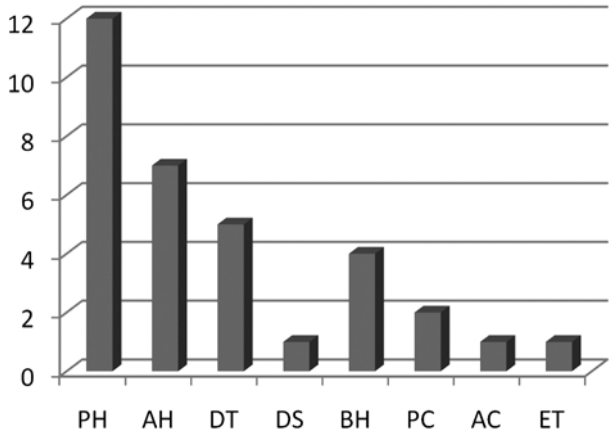

Fig. 2 — Diversity of life forms of plant diversity

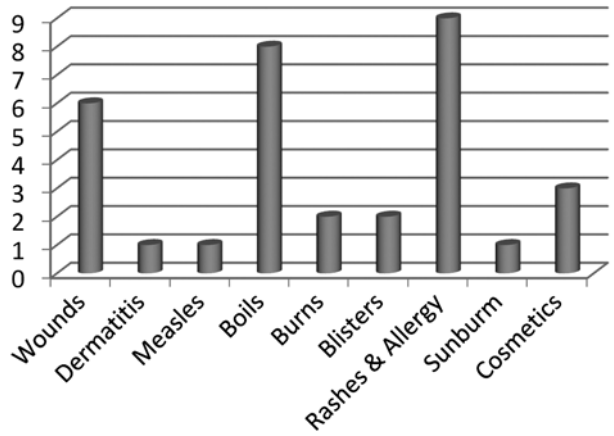

Fig. 3 — Number of plant species used for curing skin diseases and healing of wounds

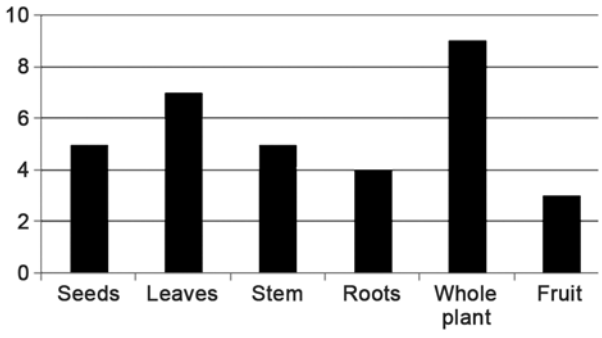

Fig. 4 — Utilization pattern

Table 1 — Diversity of plant species used to cure skin related diseases and healing of wounds in GWLS

Taxa /Local Names/ Voucher No.	Family	Habit	Nativity	Part(s) used	Mode of administration
Aesculus indica (Wall. ex Camb.) Hook (Haan doon) [1901]	Hippocastanaceae	DT	Asia	Fruits	Continuous application of paste (ash of dried fruits mixed with oil and honey) is widely applied on burns and wounds
**Allium cepa* L. (Ghandi) [1902]	Alliaceae	BH	(Asia) Persia	Bulbs	Daily use of onion juice applied locally on boils.
**Allium sativum* L. (Rohun) [1903]	Alliaceae	BH	Europe	Bulbs	Poultice of fresh bulbs is applied on the affected parts for a month to cure rashes.
Amaranthus caudatus L. (Leesi) [1904]	Amaranthaceae	AH	Africa	Leaves	Leaves after boiling in water are crushed and a paste is prepared by mixing it with salt. The paste is applied on boils to cure
**Amaranthus retroflexus* L. (Ganhar) [1905]	Amaranthaceae	AH	North America	Seeds	Roasted seeds are mixed with gur and mixture is given to children suffering from measles for about a month.
Anagalis arvensis L. (Chari saban) [1906]	Primulaceae	PH	Europe	Whole Plant	Plant juice is applied on affected parts then washed with lukewarm water. It is believed that it help to cure skin related problems.
Arisaema jacquemontii Blume. (Hapat- gogej) [1907]	Araceae	PH	Himalayan Region	Roots	For curing boils and blisters, dried root powder mixed with oil is applied on the affected parts for about 3 months.
Arnebia benthamii Wall ex. G.Don (Kahzaban) [1908]	Boraginaceae	PH	Himalayan Region	Leaves	Poultice of crushed leaves is applied on wounds for quick healing.
Asperagus racemosus Willd. (Satavar) [1909]	Asparageceae	PH	Himalayan Region	Leaves	Fresh leaves paste is applied on the skin for curing burning sensation of skin.
Berberis lycium Royle (Kaw- daech) [1910]	Berberidaceae	DS	Himalayan Region	Fruits	Fresh fruit paste is applied on wounds for quick healing.
Bergenia ligulata Engl. (Pashanabheda) [1911]	Saxifragaceae	PH	Himalaya Region	Leaves	Paste of fresh leaves is applied thrice a day on the affected areas for healing of wounds
**Calendula officinalis* L. (Hamesh Bahar) [1912]	Asteraceae	PH	Europe	Shoots	Shoot paste is applied twice a day on the wounds.
Cannabis sativa L. (Bhang) [1913]	Cannabinaceae	AH	Asia	Stems and Leaves	Dried powder of leaves and stem mixed with ghee is widely used to cure skin related problems.
Cedrus deodara (Roxb.) G.Don (Deodar) [1914]	Pinnaceae	ET	Himalayan Region	Stems	Young stem oil is used to cure skin rashes.
Cucumis sativus L. (Laere) [1915]	Cucurbitaceae	AC	Asia	Fruits	*Laere* fruits mixed with milk and lime are used as a cleaning lotion
Cuscuta reflexa Roxb. (Kuklipote) [1916]	Cuscutaceae	PC	Asia	Whole Plant	Crushed plant is applied on wounds for quick healing.
Cydonia oblonga Mill. (Bhum chounth) [1917]	Rosaceae	DT	Asia	Seeds	Boiled seeds are widely used to cure boils.
Daucus carota L. (Gazer) [1918]	Apiaceae	BH	Europe	Roots	Root paste with honey is applied on skin to cure acne.
Euphorbia wallichia Hook.f. (Gur-sochal) [1919]	Euphorbiaceae	AH	Eurasia	Whole Plant	For curing boils, milk sap of plant is applied on affected parts.
Lavatera kashmiriana Camb. (Saz posh) [1920]	Malvaceae	PH	Himalayan Region	Shoots	Plant juice is widely used for massage on hands and arms and then washed with water to cure skin itches.
Lycopersicum esculentum Mill. (Ruvangan) [1921]	Solanaceae	AH	South America	Fruits	Juice of the fruit with milk is used to treat sun burn.

(*contd.*)

Table 1 — Diversity of plant species used to cure skin related diseases and healing of wounds in GWLS (*contd.*)

Taxa /Local Names/ Voucher No.	Family	Habit	Nativity	Part(s) used	Mode of administration
Morus nigra L. (Tul kul) [1922]	Moraceae	DT	Asia	Leaves	Chewed leaves are applied on the wounds for quick healing.
Populus nigra L. (Phras) [1923]	Salicaceae	DT	Europe	Fruit	The seeds are separated from hair and the cottony hairs are applied on cuts and wounds for rapid healing.
**Portulaca oleracea* L. (Nunner) [1924]	Aizoaceae	AH	South America	Whole Plant	Plant is crushed and the paste is applied on the skin for curing burns.
Potentilla nepalensis Hook.f. (Ratanjot) [1925]	Rosaceae	PH	Himalayan Region	Whole Plant	Plant is burned and ash is applied on the skin for curing marks caused due to burns.
**Prunus armeniaca* L. (Chaire) [1926]	Rosaceae	DT	Asia	Seeds	Seeds are heated and then pressed to obtain oil, which is used to cure allergy and is also applied on for cosmetic purposes.
Rheum emodi Wall. (Pumbchalan) [1927]	Polygonaceae	PH	Himalayan Region	Roots	Warm poultice of roots is applied on boils.
Saussurea simpsoniana (Field & Gard.) Lipsch. (Jogi padshah) [1928]	Asteraceae	PH	Himalayan Region	Whole Plant	Paste of plants is applied on the boils.
Urtica dioica L. (Soi) [1929]	Urticaceae	PH	Africa	Whole plant	Plant is crushed and the extract is applied on the skin to cure allergy and rashes.
Valeriana jatamansi Jones (Mushk-e-bala) [1930]	Valerianaceae	PH	Himalayan Region	Roots	Root paste is widely applied on wounds for quick healing.
Veronica persica Poir. (Poeat kach) [1931]	Scrophulariaceae	AH	Asia	Whole Plant	Powder obtained by crushing the plant is mixed with mustard oil to make a paste. The paste is applied externally to cure dermatitis.
Vitis vinefera L. (Daech) [1932]	Vitaceae	PC	Eurasia	Leaves	Poultice of leaves is used to cure boils. Fresh leaves are tightly tied with a cloth on the skin rashes and sores.
Zea mays L. (Makai) [1933]	Poaceae	BH	South America	Seeds	Seed paste is used to cure rashes among young ones.

Abbreviations used: AH = Annual Herb, BH = Biennial Herb, PH = Perennial Herb, AC = Annual Climber, PC = Perennial Climber, DS = Deciduous Shrub, DT = Deciduous Tree; ET = Evergreen Tree; []=voucher number; and ()=Local name

*These plants grow at lower altitudes but widely used in GWLS

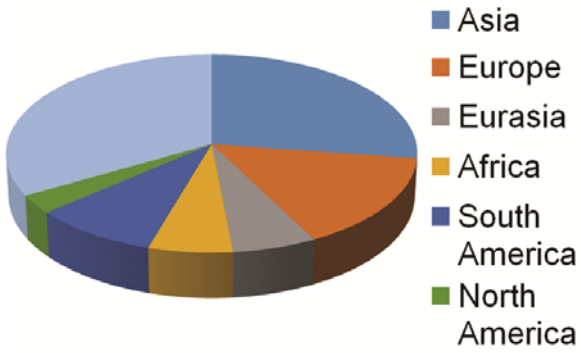

Fig. 5 — Diversity of Native and non-native species

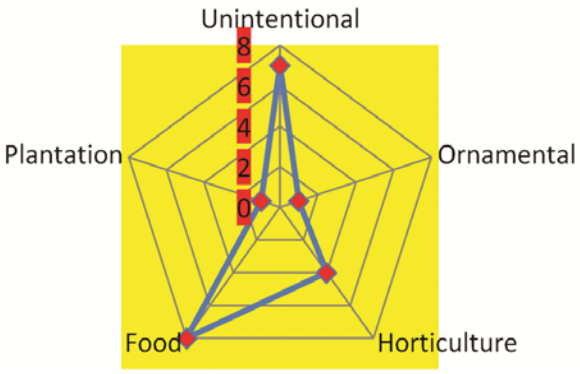

Fig. 6 — Mode of introduction of non-native species

information is transmitted orally from one generation to others since time immemorial. Further such document for the other parts of Indian Himalayan region should also be compiled so that wide-ranging database of plants used in indigenous practices could be made and information could be disseminated to

Fig. 7 — Some important ethnomedicinal plants of GWLS (a) *Amaranthus retroflexus*; (b) *Lavatera kashmiriana*; (c) *Bergenia ligulata*; (d) *Cannabis sativa;* (e) *Urtica dioica*; (f) *Berberis lyceum*; (g) *Asparagus racemosus*; (h) *Valeriana jatamansi* and (i) *Cedrus deodara*

new and upcoming generations for wide application, responsiveness and scientific validation.

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