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# Traditional herbal medicines used for the treatment of skin disorders by the *Gujjar* tribe of Sub-Himalayan tract, Uttarakhand

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In the present investigation, an attempt has been made to explore the traditional knowledge on herbal medicines used as a remedy for skin disorders by the *Gujjar* tribe of Sub-Himalayan tract, Uttarakhand. The purpose of this study is to assess traditional knowledge on medicinal plants which forms a baseline data for future pharmacological and phytochemical studies, to identify the important species used for skin medicine, finding out methods for various preparations, and calculate the % informants in relation to medicinal plant use. In this study frequent field trips were made for the collection of plant specimens and information on medicinal aspects from traditional healers and women folk through questionnaire and interviews. The knowledge of herbal preparation, parts used, mode of administration and local name was also taken during the study period. The present study has resulted in the documentation of 109 medicinal plant species belonging to 57 families and 102 genera used by the *Gujjars* for treatment of different skin ailments, viz. allergy, blisters, boils, chilblain, cracked feet, cuts, eczema, leprosy, leucoderma, ringworms, sore and wounds. The findings of present study shows documentation of 22 plant species which are found little known or less reported in available published literature. The *Gujjar* tribe lives interiorly in the forest localities and Government is making policies to rehabilitate them outside of forest areas, it is necessary to tap their rich heritable traditional knowledge on medicinal plants within time before it become vanished due to modernization. A comprehensive detailed search and report on the pattern of utilization of medicinal plants by this tribe has not evidenced in the earlier publications. Therefore, present attempt has been made to document traditional knowledge of *Gujjar* tribe used to treat different skin disorders by making various herbal preparations.

**Keywords**: *Gujjar* tribe, Herbal medicines, Skin disorders, Sub-Himalayan tract, Traditional knowledge

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According to WHO (World Health Organization), 70% population of the world depend on Traditional Health Care System (THCS) for treatment of various diseases[1]. Traditional knowledge is deeply associated with biological resources, and an important aspect of primitive cultural groups, it grows close interdependence with the environment, which also covers vast and varied scopes of knowledge. From time immemorial, folk people live mainly in less accessible and isolated areas, and used to manage their livelihood directly from forests and land. The indigenous botanical knowledge of ethnic communities relating to the uses and management of wild plant resources is extensive[2,3]. The need for the integration of local indigenous knowledge for a sustainable management and conservation of natural resources receives more and more recognition[4]. The knowledge of medicinal plants has been accumulated during the course of centuries based on various medicinal systems such as Ayurveda, Unani and Siddha. In recent years there has been an increased interest on medicinal plants and Traditional Herbal Medicines (THM), are practiced in several parts of the world. In India ethnomedicinal investigations also received considerable attention and attracted large number of workers on different aspects[5-10].

The Uttarakhand Himalaya is one of the most delightful regions of Northern India, rich in biological wealth and cultural heritage and is well known for its herbal resources. Medicinal wealth of the state, used by different societies or locals in various parts is studied by several workers to explore the traditional

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phytotherapy[11-19]. The Sub-Himalayan tract or tarai region (adjacent to plains) of Uttarakhand Himalaya represents rich and diversified vegetation and ranging from 400-1000 m.a.s.l. The tract is inhabited by important tribal communities as *Bhoxa*, *Gujjar*, *Tharu*, *Raji* and *Jaunsari*, and cultural heterogenicity is one of its important features. The *Van Gujjar*s (forest *Gujjar*s) are found in the lower parts of Uttarakhand state and are one of the most important migratory tribes of the Sub-Himalayan tract. They are believed to be of Indo-Iranian origin. The *Van-Gujjar*s follow Islam and have their own traditions. They inhabit in close proximity to their environment along with the livestock and roaming from one place to another in different habitats. Their livelihood is greatly dependent on the traditionally maintained ecosystems. Their beliefs and actions are related with the conservation of nature, in the terms of resource utilization[20]. Due to lack of modern facilities the folk is still dependent on phytotherapy for their primary healthcare. Some old and experienced *Gujjar*s have good traditional knowledge of medicinal plants for the treatment of different diseases and they keep them during their journey periods.

The present research article comprises the documentation of medicinal plants used as a remedy for different skin disorders by the *Gujjar* tribe. Various records on traditional knowledge of the plant species used for treatment of skin diseases by different tribal communities or local people are reported in different parts of India[21-27], but no previous records are available on the folk knowledge of plants used for treating various skin ailments by the *Gujjar* tribe of Sub-Himalayan tract in Uttarakhand. Therefore, an attempt has been made for the collection of ethnomedicinal information from this tribe of the study area.

## Methodology

The present work was undertaken in the different parts of Sub-Himalayan tract including the parts of districts Haridwar, Dehradun and Pauri inhabited by the *Gujjar* people. The most frequently visited villages and places were Naggadi, Chidiyapur, Pathri, Gandikhata, Kisanpur, Laldhang in district Haridwar; Rawasan, Siggadi, Chillagaon, Kunaochod, Kumbhichod in district Pauri and Pathri in district Dehradun. The extensive field surveys were conducted in all the seasons during the period 2008–2010 covering all the study sites. During the course of the study, about 18 field trips were conducted in the study area and surveys were done by a random selection of informants[7,28]. The analysis of data was made with the help of group discussions among different age classes and both the genders of the community as Participatory Rural Approach (PRA)[29]. The data of medicinal plants was collected from 64 individuals including 46 males and 18 females, comprised of experienced herbal practitioners. Most of the interviewees were more than 50 yrs old. The % informant was calculated to estimate user variability of medicinal plants to indicate the homogeneity of the information and to test the consistency of informant's knowledge in treating a particular disease. The Prior Informed Consent was taken from the knowledge providers as per CBD guidelines. A semi-structured questionnaire was used to extract information on different types of skin ailments treated by the herbal preparations made of medicinal plants parts. The data was also gathered on various aspects as local names, method of preparation of drug and mode of administration. The documented data was cross-checked for the confirmation of collected information. The medicinal plant species were identified with the help of Flora of the District Garhwal: North West Himalaya[5]. Collection and maintenance of plant specimens have been made by following standard methodology[30,31]. The collected plant specimens on which information is based, i.e. voucher specimens were deposited in the Herbarium of Garhwal University, Srinagar Garhwal (GUH).

## Results

The information includes the medicinal value of 109 plant species of angiosperms belonging to 57 families and 102 genera, collected from the *Gujjar* folk. The ethnomedicinal data on skin remedies is presented alphabetically with family and botanical names, followed by local names, Herbarium number, part(s) used, form of preparation and route of administration and % informants (Table 1). The results revealed that total 24 plants are used to treat allergy, 12 for blisters, 30 for boils, 5 for chilblain, 4 for cracked feet, 12 for cuts, 11 for eczema, 6 for leprosy, 9 for leucoderma, 5 for ringworm, 2 for sore and 27 for wounds. Results revealed that the common mode of administration is external (91.95%) than to the internal (8.05%), as the diseases to be cured are skin disorders which consistently requires the external

Table 1—Plants used for the treatment of skin disorders by the *Gujjar* tribe of Sub-Himalayan tract

| S.No. | Botanical name [Synonym] | Local name | Herbarium No. (GUH-JS-) | Habit | Disease treated, part (s) used and method of preparation | % Inf. |
|---|---|---|---|---|---|---|
| | Acanthaceae | | | | | |
| 1. | *Barleria prionitis* L. | *Chota bansa* | 18885 | Shrub | The leaf paste is externally applied on skin allergy and chilbalins.* | 4.7 |
| 2. | *Eranthemum pulchellum* Andrews | *Kamliya* | 20176 | Shrub | The plant paste is applied on boils. The leaves are fried in *Brassica campestris* oil (sarsoon) and applied externally on cracked feet's. | 10.9 |
| 3. | *Lepidagathis cuspidata* Nees | *Ghunphru* | 20263 | Shrub | The paste of leaves is applied externally on boils and blisters. | 15.6 |
| 4. | *Phlogacanthus thyrsiformis* (Hardw.) Mabb. | *Kukdi* | 20215 | Shrub | The paste of leaves is applied on cuts and wounds.* | 3.1 |
| 5. | *Ruellia tuberosa* L. | *Mashenda* | 20227 | Herb | The fruits are crushed and applied on blisters. | 18.8 |
| | Amaranthaceae | | | | | |
| 6. | *Achyranthes aspera* L. | *Perkanda* | ` | Herb | The paste of leaves is applied externally on skin allergy. | 14.0 |
| 7. | *Amaranthus spinosus* L. | *Chaleri* | 18832 | Herb | The paste of roots is applied on boils and carbuncle.* | 9.4 |
| 8. | *Celosia argentea* L. | *Gamla* | 19715 | Shrub | The decoction of leaves is used to wash skin allergy.* | 6.3 |
| | Amaryllidaceae | | | | | |
| 9. | *Crinum viviparum* (Lam.) R.Ansari & V.J.Nair | *Pindar* | 20315 | Herb | The paste of bulb is applied externally on boils and skin allergy.* | 3.1 |
| | Anacardiaceae | | | | | |
| 10. | *Buchanania cochinchinensis* (Lour.) M.R.Almeida | *Piyaal* | 20322 | Tree | Seed powder is mixed with milk and applied on pimples. The paste of leaves is applied over wounds. | 9.3 |
| 11. | *Lannea coromandelica* (Houtt.) Merr. | *Kembal* | 18876 | Tree | The paste of bark is applied externally on wounds. | 6.2 |
| 12. | *Mangifera indica* L. | *Amm* | 20163 | Tree | The gum is applied externally on boils. | 25.1 |
| 13. | *Spondias pinnata* (L.f.) Kurz | *Aamra* | 20346 | Tree | The paste of fruit is applied on blisters. | 10.9 |
| | Apocynaceae | | | | | |
| 14. | *Rauvolfia serpentina* (L.) Benth. ex Kurz | *Gandhak* | 18866 | Shrub | The root paste is mixed with oil of *Cinamomum tamala* (tejpaat) and externally applied on leucoderma in night.* | 7.8 |
| 15. | *Vallaris solanacea* (Roth) Kuntze | *Bakki* | 19763 | Climber | The plant paste is applied on eczema. The latex is applied on wounds. | 21.8 |
| 16. | *Wrightia arborea* (Dennstaedt) Mabberley | *Dhudla* | 20372 | Tree | The latex is applied on cuts, wounds and on skin allergy. | 12.5 |
| | Asclepiadaceae | | | | | |
| 17. | *Calotropis gigantea* (L.) Dryander | *Aak* | 20351 | Shrub | The latex is applied externally to treat ringworm. The latex is applied externally on chilbalins. | 9.3 |
| 18. | *Calotropis procera* (Aiton) Dryander | Aakwa | 18896 | Shrub | The roots are ground and applied externally on leucoderma.* | 4.6 |
| | Asteraceae | | | | | |
| 19. | *Ageratum conyzoides* (L.) L. | *Podhina jadi* | 18868 | Herb | The leaf juice is applied externally on cuts to stop bleeding. | 12.5 |
| 20. | *Inula cappa* (Buch.-Ham. ex D.Don) DC. | *Damiya* | 20166 | Shrub | The fruits are crushed and applied externally on blisters. | 7.8 |
| 21. | *Tridex procumbens* (L.) L. | *Tatua* | 18817 | Herb | The paste of leaves is applied on cuts and wound to stop bleeding. | 17.1 |
| | Basellaceae | | | | | |

(*Contd.*)

Table 1—Plants used for the treatment of skin disorders by the *Gujjar* tribe of Sub-Himalayan tract (*Contd*.)

| S.No. | Botanical name [Synonym] | Local name | Herbarium No. (GUH-JS-) | Habit | Disease treated, part (s) used and method of preparation | % Inf. |
|---|---|---|---|---|---|---|
| 22. | *Basella alba* L. | *Koi* | 20130 | Climber | The plant is crushed, made into paste with milk and applied on leucoderma*. The leaf is coated with mustard oil, slightly warmed and tied on boils. | 3.1 |
| | Boraginaceae | | | | | |
| 23. | *Cynoglossum lanceolatum* Forssk. | *Ajwain* | 20204 | Herb | The juice of leaves is used over skin allergy.* | 1.5 |
| | Brassicaceae | | | | | |
| 24. | *Brassica juncea* (L.) Czern. | *Lai* | 20302 | Herb | The paste of seeds is externally used on boils and skin allergy. | 4.6 |
| | Buddlejaceae | | | | | |
| 25. | *Buddleja asiatica* Lour. | *Jangli methi* | 20239 | Shrub | The paste of leaves and seeds are mixed and applied on wounds. | 9.3 |
| | Burseraceae | | | | | |
| 26. | *Garuga pinnata* Roxb. | *Kharpat* | 20330 | Tree | The bark paste is applied externally on wounds. | 14.0 |
| | Caesalpiniaceae | | | | | |
| 27. | *Cassia fistula* L. | *Karangal* | 18842 | Tree | Leaf paste is applied externally in ringworm. | 12.5 |
| 28. | *Senna occidentalis* (L.) Link | *Badi hedma* | 18820 | Shrub | The fruit paste is applied externally to cure leucoderma. | 6.2 |
| 29. | *Senna tora* (L.) Roxb. | *Choti hedma* | 20146 | Shrub | The seed powder is mixed with flour of *Triticum aestivum* (wheat), made into paste and applied externally in the treatment of boils.* | 9.3 |
| | Caryophyllaceae | | | | | |
| 30. | *Stellaria media* (L.) Vill. | *Seeton* | 20187 | Herb | The paste of leaves is applied externally on boils. | 10.9 |
| | Celastraceae | | | | | |
| 31. | *Celastrus paniculatus* Willd. | *Sisiya/Talli* | 19734 | Shrub | The paste of leaves is applied externally on eczema. The ash of roots is mixed with fruit piece of *Citrus pseudolimon* (galgal) and placed in an earthen pot for a whole night; the whole material is dried in shade in early morning and made into paste, this preparation is given orally (2-3 gm), twice a day for 10-15 days with cold water to treat body allergy, milk is avoided during treatment*. | 3.1 |
| | Cleomaceae | | | | | |
| 32. | *Cleome gynandra* L. | *Hulhar* | 19703 | Herb | The leaf powder of plant and *Lawsonia inermis* (mehndi) is made into paste and applied externally on feet's and between toes while working in paddy fields*. The whole plant paste is applied externally on skin allergy. | 17.1 |
| | Combretaceae | | | | | |
| 33. | *Terminalia alata* Heyne ex Roth | *Asin* | 18856 | Tree | The paste of leaves is applied over skin allergy. | 7.8 |
| | Commelinaceae | | | | | |
| 34. | *Commelina benghalensis* L. | *Fatniya* | 20160 | Herb | The paste of plant is applied externally on wounds. The juice of leaves (one teaspoonful) is taken internally twice a day for 1-2 weeks, in the treatment of leprosy*. | 3.1 |
| | Convolvulaceae | | | | | |
| 35. | *Ipomoea carnea* Jacq. | *Beshram* | 20138 | Shrub | The leaves are fried in *Brassica campestris* oil (sarsoon) and tied externally on cuts and wounds to get quick relief. | 3.1 |

(*Contd*.)

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| S.No. | Botanical name [Synonym] | Local name | Herbarium No. (GUH-JS-) | Habit | Disease treated, part (s) used and method of preparation | % Inf. |
|---|---|---|---|---|---|---|
| | Crasullaceae | | | | | |
| 36. | *Bryophyllum pinnatum* (Lam.) Oken | *Patharchatta* | 18882 | Herb | The paste of leaves is applied externally on boils and sores. | 10.9 |
| | Cucurbitaceae | | | | | |
| 37. | *Cucumis sativus* L. | *Bankheera* | 18884 | Climber | The seeds are crushed and its paste is applied externally on eczema and on leucoderma. | 14.0 |
| 38. | *Momordica dioica* Roxb. ex Willd. | *Karela* | 20350 | Climber | The paste of roots is applied on boils. | 4.6 |
| | Cuscutaceae | | | | | |
| 39. | *Cuscuta reflexa* Roxb. | *Andarbel* | 19749 | Parasite | The paste of plant is applied on leprosy. | 20.3 |
| | Dioscoreaceae | | | | | |
| 40. | *Dioscorea belophylla* (Prain) Voigt ex Haines | *Sirganth* | 20322 | Herb | The root paste is mixed with buffalo's milk (produce after delivery, locally known as *Kheej*) and applied externally on chilbalins.* | 3.1 |
| | Ehretiaceae | | | | | |
| 41. | *Cordia dichotoma* G.Forst. | *Lasoda* | 20271 | Tree | The fruit juice is applied on blisters. | 6.2 |
| | Euphorbiaceae | | | | | |
| 42. | *Croton bonplandianus* Baill. | *Vanpipli/Van mircha* | 18828 | Herb | The paste of leaves is applied on cuts. | 14.0 |
| 43. | *Euphorbia hirta* L. | *Badi dudhi* | 18829 | Herb | The plant paste is applied externally on cuts and wounds. | 12.5 |
| 44. | *Jatropha curcas* L. | *Arandi* | 19746 | Shrub | The juice of roots is applied on sores. | 7.8 |
| 45. | *Mallotus philippensis* (Lam.) Muell.Arg. | *Kamela* | 20148 | Tree | The powder of fruits is mixed with ghee, made into paste and externally applied on boils. | 15.6 |
| 46. | *Phyllanthus amarus* Schumach. & Thonn. | *Tamalki* | 19748 | Herb | The crushed leaves are made into paste and applied externally on skin allergy. | 10.9 |
| 47. | *Ricinus communis* L. | *Aarand* | 18877 | Shrub | The leaves are fried in oil of mustard, made into paste and externally applied on wounds. | 9.3 |
| | Fabaceae | | | | | |
| 48. | *Abrus precatorius* L. | *Badi ratti* | 18867 | Climber | The juice of leaves of plant and roots of *Plumbago zeylanica* are mixed together and applied over leucoderma. | 12.5 |
| 49. | *Alysicarpus vaginalis* (L.) DC. | *Chuklai* | 18881 | Herb | The leaf paste is applied externally on skin allergy.* | 1.5 |
| 50. | *Dalbergia sissoo* DC. | *Talli* | 20373 | Tree | Leaves and bark are mixed together, made into paste and applied externally on eczema | 4.6 |
| 51. | *Indigofera hirsuta* L. | *Ultu* | 18875 | Herb | The seed paste is applied externally to treat blisters and ringworm. | 10.9 |
| 52. | *Indigofera linifolia* (L.f.) Retz. | *Tisiya* | 20198 | Herb | The paste of plant is applied on wounds. | 7.8 |
| 53. | *Milletia extensa* (Benth.) Baker | *Saland* | 20183 | Climber | The bark paste is applied over wounds. | 12.5 |
| 54. | *Ougeinia oojeinensis* (Roxb.) Hochr. | *Sandan* | 20182 | Tree | The bark paste is applied externally on skin allergy.* | 4.6 |
| 55. | *Pongamia pinnata* (L.) Pierre | *Karanju* | 18847 | Tree | The oil extracted from seeds is externally applied on itching and skin allergy. | 6.2 |
| | Flacourtiaceae | | | | | |
| 56. | *Casearia elliptica* Willd. | Chilla | 20226 | Tree | The paste of leaves is applied on wounds to check bleeding. The paste of stem bark is applied on skin allergy. | 14.0 |

(*Contd.*))

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| S.No. | Botanical name [Synonym] | Local name | Herbarium No. (GUH-JS-) | Habit | Disease treated, part (s) used and method of preparation | % Inf. |
|---|---|---|---|---|---|---|
| 57. | *Flacourtia indica* (Burrm. f.) Merr. | *Kaith* | 20285 | Tree | The paste of bark is applied on boils or carbuncle. | 3.1 |
| | Fumariaceae | | | | | |
| 58. | *Fumaria indica* (Hausskn.) Pugsley | *Jangli dhaniya* | 19745 | Herb | The plant is made into paste and applied externally on skin allergy. | 17.1 |
| | Hypoxidaceae | | | | | |
| 59. | *Curculigo orchioides* Gaertn. | *Kali musli* | 18861 | Herb | The paste of leaves is applied externally on skin allergy. | 9.3 |
| | Lamiaceae | | | | | |
| 60. | *Leonotis nepetifolia* (L.) R.Br. | *Chariyata* | 18887 | Herb | The inflorescence is pounded and its paste is applied on skin allergy. | 10.9 |
| 61. | *Leucas lanata* Benth. | *Rosiya* | 18812 | Herb | The whole plant is made into paste and applied on wounds. | 4.6 |
| 62. | *Pogostemon benghalensis* (Burrm. f.) Kuntze | *Lojad* | 18809 | Shrub | The paste of leaves is applied on boils and blisters. | 6.2 |
| | Lauraceae | | | | | |
| 63. | *Litsea glutinosa* (Lour.) C.B. Rob. | *Rain* | 18823 | Tree | The bark paste is applied on skin allergy. | 3.1 |
| | Liliaceae | | | | | |
| 64. | *Allium cepa* L. | *Gantha* | 20356 | Herb | The bulbs are pounded and paste is applied externally on skin allergy. | 10.9 |
| 65. | *Allium sativum* L. | *Lehsun* | 18889 | Herb | The paste of bulb is externally applied on blisters. | 15.6 |
| 66. | *Aloe vera* (L.) Burm. f. | *Chinnar* | 20311 | Herb | The ash of leaves is tied with the help of cotton on boils or abscess. | 12.5 |
| | Linaceae | | | | | |
| 67. | *Linum usitatissimum* L. | *Alsi* | 20120 | Herb | The paste of seeds is applied externally on boils. | 9.3 |
| | Loranthaceae | | | | | |
| 68. | *Dendrophthoe falcata* (L.f.) Ettingsh. | *Globel* | 20294 | Parasite | The roots are crushed and its juice is applied on skin allergy. | 7.8 |
| | Lyrthaceae | | | | | |
| 69. | *Lagerstroemia parviflora* Roxb. | *Dhauri* | 20220 | Tree | The bark paste is used externally on wounds. | 4.6 |
| | Malvaceae | | | | | |
| 70. | *Abutilon indicum* (L.) Sweet | *Kandai* | 18818 | Shrub | The root paste is applied externally in leprosy. | 4.6 |
| 71. | *Hibiscus sabdariffa* L. | *Kappa* | 20352 | Herb | The leaf powder of plant and *Lawsonia inermis* (mehndi) is mixed together, made into paste and applied on cracked feet's to cure wounds, especially in rainy season.* | 1.5 |
| 72. | *Urena lobata* L. | *Tamni* | 19725 | Herb | The paste of whole plant is applied externally on boils and eczema.* | 3.1 |
| | Meliaceae | | | | | |
| 73. | *Melia azedarach* L. | *Baikan* | 18895 | Tree | The fruit paste is applied externally on skin allergy. | 9.3 |
| | Menispermaceae | | | | | |
| 74. | *Cissampelos pareira* L. | *Paadha/Simrubel* | 18827 | Climber | The paste of leaves is externally applied on boils. | 7.8 |
| 75. | *Cocculus hirsutus* (L.) W.Theob. | *Magh* | 19777 | Climber | The paste of leaves is applied on eczema. | 10.9 |

(*Contd.*)

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|---|---|---|---|---|---|---|
| | Mimosaceae | | | | | |
| 76. | *Pithecellobium dulce* (Roxb.) Benth. | *Jangal jalebi* | 19755 | Tree | The paste of bark is applied on leprosy. | 7.8 |
| | Moraceae | | | | | |
| 77. | *Ficus racemosa* L. | *Rombad* | 20127 | Tree | The paste of leaves is used in healing of wounds. The decoction (1-2 teaspoonfuls) of fruits is taken internally once a day for 2 weeks, to cure leprosy and its paste is applied externally for the same. | 9.3 |
| | Myrtaceae | | | | | |
| 78. | *Syzygium cumini* (L.) Skeels | *Phalenda* | 20370 | Tree | The paste of leaves is used externally on blisters. | 6.2 |
| | Nyctaginaceae | | | | | |
| 79. | *Mirabilis jalapa* L. | *Gulbans* | 20343 | Herb | The leaf juice is applied externally on boils. | 3.1 |
| | Orchidaceae | | | | | |
| 80. | *Vanda tessellata* (Roxb.) Hook. ex G. Don. | *Pangru* | 20349 | Epiphyte | The root paste is applied externally on boils. | 4.6 |
| | Papaveraceae | | | | | |
| 81. | *Argemone mexicana* L. | *Pauns* | 18838 | Herb | The latex is applied externally in cracks on feet. The latex along with cow milk is placed in copper pot for 3 days and applied externally in leucoderma. The yellow latex is applied between toes while working on paddy fields.* | 3.1 |
| | Passifloraceae | | | | | |
| 82. | *Passiflora foetida* L. | *Katori* | 19788 | Climber | The paste of leaves is applied on wounds. | 10.9 |
| | Plumbaginaceae | | | | | |
| 83. | *Plumbago zeylanica* L. | *Chitrajadi* | 18801 | Shrub | The leaf paste is applied externally in eczema. The paste of roots is applied externally on skin allergy and on boils. | 9.3 |
| | Poaceae | | | | | |
| 84. | *Cynodon dactylon* (L.) Pers. | *Dhoob* | 20293 | Herb | The plant paste is applied on cuts and wounds to stop bleeding. | 12.5 |
| 85. | *Eulaliopsis binata* (Retz.) C.E.Hubb. | *Babya* | 18808 | Herb | The plant juice is applied on cuts.* | 1.5 |
| | Polygonaceae | | | | | |
| 86. | *Persicaria barbata* (L.) H.Hara | *Totiya/Phola n* | 18806 | Herb | The juice of leaves is applied on cuts. | 9.3 |
| 87. | *Rumex hastatus* D.Don | *Khayadi* | 19778 | Herb | The whole plant is ground and the paste is applied externally on wounds. | 6.2 |
| | Primulaceae | | | | | |
| 88. | *Anagallis arvensis* L. | *Jod-thod* | 20270 | Herb | The plant paste is used over boils. | 4.6 |
| | Rosaceae | | | | | |
| 89. | *Prunus persica* (L.) Stokes | *Adu* | 18803 | Tree | The oil of seeds is effective externally in the treatment of skin allergy. | 10.9 |
| | Rubiaceae | | | | | |
| 90. | *Catunaregam spinosa* (Thunb.) Tirveng. | *Raadha* | 19711 | Shrub | The paste of stem bark is applied on wounds. | 7.8 |
| | Scrophulariaceae | | | | | |

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| S.No. | Botanical name [Synonym] | Local name | Herbarium No. (GUH-JS-) | Habit | Disease treated, part (s) used and method of preparation | % Inf. |
|---|---|---|---|---|---|---|
| 91. | *Bacopa monnieri* (L.) Wettst. | *Nir-brihmi/ Barmi* | 20254 | Herb | The whole plant is crushed and applied externally on eczema. | 4.6 |
| 92. | *Torenia cordifolia* Roxb. | *Baigni/ Simra* | 20245 | Herb | The paste of whole plant is applied on eczema.* | 4.6 |
| 93. | *Verbascum chinense* (L.) Santapau | *Perkanda* | 20212 | Herb | The juice of leaves is applied on cuts. | 6.2 |
| 94. | *Verbascum thapsus* L. | *Phuliya* | 18811 | Herb | The seed paste is used externally on leucoderma. | 4.6 |
| | Solanaceae | | | | | |
| 95. | *Nicotiana plumbaginifolia* Viv. | *Maalan* | 19713 | Herb | The leaf paste is applied externally on wounds and itching. | 10.9 |
| 96. | *Solanum erianthum* D.Don | *Teerambal* | 19782 | Shrub | The roots are slightly warmed, made into paste and applied on cuts and wounds.* | 1.5 |
| 97. | *Solanum americanum* Mill. | *Kyankodi* | 19716 | Herb | The fruit powder (2 gm) with milk is given orally in boils, thrice a day for 2 weeks. The paste of plant is applied on boils to remove pus. | 1.5 |
| 98. | *Withania somnifera* (L.) Dunal | *Talwaada* | 18897 | Shrub | The leaves and stem is burnt and ash is mixed with mustard oil; this paste is applied on boils. | 10.9 |
| | Tiliaceae | | | | | |
| 99. | *Triumfetta rhomboidea* Jacq. | *Chutri* | 20157 | Herb | The paste of leaves is applied externally to get relief from eczema. | 12.5 |
| | Ulmaceae | | | | | |
| 100. | *Holoptelea integrifolia* Planch. | *Kanju/Papri* | 20219 | Tree | The tender leaves paste is applied externally on eczema.<br>The paste of inner bark is applied on blisters. | 9.3 |
| | Verbenaceae | | | | | |
| 101. | *Callicarpa macrophylla* Vahl | *Kingharu* | 19733 | Shrub | The paste of leaves applied externally on chilbalins.* | 7.8 |
| 102. | *Lantana camara* L. | *Rosiya* | 18812 | Shrub | The paste of leaves is applied on ringworm. | 3.1 |
| 103. | *Premna mollissima* Roth | *Chakoriya* | 20368 | Tree | The paste of bark is applied externally on ringworm. | 6.2 |
| 104. | *Vitex negundo* L. | *Maala* | 18836 | Shrub | The leaves are fried in mustard oil, made in to paste and applied on boils. | 9.3 |
| | Vitaceae | | | | | |
| 105. | *Ampelocissus latifolia* (Roxb.) Planch. | *Pankhi* | 19702 | Climber | The fruit paste is used externally on chilbalins.<br>The paste of roots is applied on wounds. | 7.8 |
| 106. | *Cayratia trifolia* (L.) Domin | *Kaali bel* | 18850 | Climber | The paste of leaves is externally used on cuts and wounds. | 4.6 |
| | Zinziberaceae | | | | | |
| 107. | *Cheilocostus speciosus* (J.König) C.Specht | *Rasoliya* | 18871 | Herb | The paste of leaves is used externally on boils.<br>The root paste is mixed with oil of *Cinnamomum tamala* (tejpaat) and applied on boils.* | 1.5 |
| 108. | *Curcuma longa* L. | *Basar* | 20192 | Herb | The paste of rhizome is applied on leprosy. | 3.1 |
| | Zygophyllaceae | | | | | |
| 109. | *Tribulus terrestris* L. | Gokhru | 19728 | Herb | The paste of whole plant is applied on cracked feet.* | 4.6 |

*herbal remedies found little reported or not commonly used through consulting the available literature.

course of treatment. Dosage pattern have been mentioned wherever available with the particular species including quantity of medicine, its frequency and duration, and it depends mainly on the severity of disease as well as on age of the patient. The often used form of herbal preparation is paste (78.05%) as compared to juice (8.94%), latex (6.50%), powder (2.44%), decoction (2.44%) and ash (1.63%). Although all the parts are used to heal remedies, however, interestingly use of leaves is very frequent (38.96%) as compared to whole plant (19.48%), bark (10.39%), roots (9.09%), seeds (8.4%), fruits (7.14%)

and other parts. During the findings it has been noticed that herbaceous plants are more commonly used (44%) as compared to shrubs (26%), trees (24%), climbers (11%), parasites (2%) and epiphyte (1%).

## Discussion

The present paper is an attempt to analyze the resources with respect to medicinal plants used for betterment of skin disorders by the *Gujjar*s. Total of 109 plant species are reported to be used to cure various skin ailments through different herbal preparations. The common skin disorders treated by the tribe are allergy, boils, blisters, chilblain, cracked feet, cuts, eczema, leprosy, leucoderma, ringworm, sore and wounds. Most of the species are used to treat a single disease, while among them 35 are found used to cure more than one ailment, either same parts or different parts. The common 35 species used for betterment of more than one ailments are *Abutilon indicum*, *Ampelocissus latifolia*, *Argemone mexicana*, *Barleria prionitis*, *Basella alba* , *Bryophyllum pinnatum*, *Callicarpa macrophylla*, *Calotropis gigantea*, *Casearia elliptica*, *Cayratia trifolia*, *Commelina benghalensis*, *Cordia dichotoma*, *Crinum viviparum*, *Cucumis sativus*, *Curcuma longa*, *Cynodon dactylon*, *Dendrophthoe falcata*, *Eranthemum pulchellum*, *Ficus racemosa*, *Holoptelea integrifolia*, *Indigofera hirsuta*, *Ipomoea carnea*, *Lepidagathis cuspidata*, *Litsea glutinosa*, *Phlogacanthus thyrsiformis*, *Plumbago zeylanica*, *Pogostemon benghalense*, *Ruellia tuberosa*, *Solanum erianthum*, *Solanum americanum*, *Tridex procumbens*, *Urena lobata*, *Vallaris solanacea*, *Vanda tesselata* and *Wrightia arborea*. In some cases two different parts of same species are used together for preparation of herbal drug e.g. in treatment of boils leaf and seed paste of *Senna tora* mixed together and used externally, similar as leaf and root paste of *Vitex negundo* and leaf and stem paste of *Withania somnifera* for the same disease; the leaf and bark paste of *Dalbergia sissoo* together used externally as a remedy for eczema, while in some other cases parts of two different species are used together as a remedy, e.g. leaf juice of *Abrus precatorius* and *Plumbago zeylanica* for the treatment of leucoderma. The information also was checked with available literature[5,7,32]. Some of the medicinal remedies are found less reported, while some other are available in earlier literature but are quite different in their preparation, use method and parts of plants, including 22 plant species as *Cheilocostus speciosus* and *Senna tora* for boils, *Amaranthus spinosus* for carbuncle, *Barleria prionitis*, *Callicarpa macrophylla* and *Dioscorea belophylla* for chilblains, *Eulaliopsis binnata* for cuts, *Torenia cordifolia* and *Urena lobata* for eczema, *Commelina benghalensis* for leprosy, *Basella alba, Calotropis procera,* and *Rauvolfia serpentina* for leucoderma*, Alysicarpus vaginalis, Celastrus paniculatus, Celosia argentea, Cynoglossum lanceolatum* and *Ougeinia oojeinensis* for skin allergy, *Argemone mexicana* and *Cleome gynandra* for toes infection, *Solanum erianthum* and *Phlogacanthus thyrsiformis* for wounds. Pharmacological investigations on these herbal medicines should be a multidisciplinary research involving observation and discovery of chemical compounds of biological importance which can be of great significance in therapeutic treatments.

## Traditional Significance of study to the society and some constructive recommendations

Traditional knowledge on medicinal plants has been preserved by the indigenous communities for centuries and this unique traditional knowledge confined within local tradition reserves provides precious inputs that can be helpful in conservation of natural forest resources. The knowledge of traditional uses of medicinal plants by the indigenous communities is likely to be lost in near future, and for this it is essential to document existing available information and immediate need to conserve the nature's wealth. The traditional uses of medicinal plants in healthcare practices provide clues to new areas of research for new biological compounds and discovery of new drugs[18]. The present study has provided valuable information about some of the important medicinal plants used to treat skin disorders by the *Gujjar* tribe of Sub-Himalayan tract. Detailed pharmacological research on the recorded plants and their derivatives may be undertaken to provide new alternative treatments and therapeutic uses for skin diseases. We hope that this paper will form firm basis for further investigations into natural products from the recorded ethnomedicinal plants.

## Conclusion

The study depicts that the *Gujjar* folk possess very good knowledge about the herbal medicines along with their age old traditional knowledge. They are forest dweller community and state Government is in

process to rehabilitate them outside of forest localities, therefore, their forest based knowledge system is in verge of fast depletion, together with modernization syndrome. Thus tapping of their traditional knowledge is much warranted before it vanishes. The *Gujjar* people have good knowledge of herbal plants used for treating various ailments including skin problems which they face during the routine schedule of their working in forest. The studies of different uses of plant species by the tribe provide documentation of information which is new for scientific societies. The valuable traditional knowledge of herbal medicines requires more scientific researches to check the properties of plant and phytochemical analysis for the discovery of new drugs and compounds. The active constituents of traditional herbal remedies should be discovered and synthesized into new medicines of wider scopes. A large proportion of medicinal plants are used in domestic markets, due to excessive extraction of medicinal plant species in high, there has seen a serious depletion of biological resources, therefore, to introduce policies to promote the conservation of these species and encourage farmers and tribal people to cultivate them provide supplement to their incomes.

Due to a lack of well organized distribution of knowledge concerning these herbal remedies, it is believed that little of this knowledge will stay alive when the older generation has passed away. Several of the remedial measures are little known to the scientific field to substantiate future bioprospectives, particularly in phytotherapeutic concerns. Such study reveals overall understanding of resource utilization, which is much supportive to sustainable biological management and conservation. Therefore, through the ethnomedicinal studies attention should be paid for the documentation of traditional knowledge system for the advancement of healthcare system.

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## References

1 WHO, World Health Organization Traditional Medicine Strategy 2002-2005, WHO, Geneva, 11, 2002.

2 Cotton CM, *Ethnobotany: Principles and Applications*, (John Wiley, Sussex), 1992.

3 Balick MJ & Cox PA, *Plants, People and Culture: the Science of Ethnobotany,* (W.H. Freeman and Company, New York), 1996, 1-228.

4 Posey D, Traditional knowledge, Conservation and the Rain Forest Harvest, In: *Sustainable Harvest and Marketing of Rain Forest Products*, edited by Plotkin M & L Famolare, (Island Press, Washington DC), 1992, 46-50.

5 Gaur RD, *Flora of the District Garhwal: North West Himalaya (with Ethnobotanical Notes*), (Transmedia, Srinagar, Garhwal), 1999.

6 Jain SK, *Medicinal Plants*, (National Book Trust, India), 1968, 1-216.

7 Jain SK, *Dictionary of Indian Folk Medicine and Ethnobotany*, (Deep Publishers, New Delhi), 1991.

8 Kirtikar KK & Basu BD, *Indian Medicinal Plants*, Vol. 1-8, (Lalit Mohan Basu, Allahabad, India), 1935.

9 Maheshwari JK, *Ethnobotany and medicinal plants of Indian subcontinent*, (Scientific Publishers, Jodhpur, India), 2000.

10 Pandey G, *Medicinal Plants of Himalaya*, Vol. I–II, (Sri Satguru Publications, Delhi, India), 1995.

11 Bhatt KC & Gaur RD, A contribution to ethnobotany of Rajis in Pithoragarh district, *Acta Bot Indica*, 20 (1992) 76-83.

12 Gaur RD & Sharma Jyotsana, Indigenous knowledge on the utilization of medicinal plants diversity in Siwalik region of Garhwal Himalaya, Uttarakhand, *J Forest Sci*, 27(1) (2011) 23-31.

13 Gaur RD, Semwal JK & Tiwari JK, A survey of high altitude medicinal plants of Garhwal Himalaya, *Bull Medico Ethnobot Res*, 3&4 (1984) 102-116.

14 Gaur RD, Sharma Jyotsana & Painuli RM, Plants used in traditional healthcare of livestock by *Gujjar* community of Sub-Himalayan tracts, Uttarakhand, India, *Indian J Nat Prod Resour,* 1(2) (2010) 243-248.

15 Maheswari JK & Singh H, Herbal remedies of Bhoxas of Nainital district, UP, *Aryavaidyan*, 4 (1990) 30-34.

16 Rana CS, Tiwari JK, Dangwal LR & Gairola S, Faith herbal healer knowledge document of Nanda Devi Biosphere Reserve, Uttarakhand, India, *Indian J Tradit Knowle,* 12(2) (2013) 308-314.

17 Sharma Jyotsana, Gairola S, Gaur RD & Painuli RM, Medicinal Plants used for primary healthcare by Tharu Tribe of Udham Singh Nagar Uttarakhand, India. *Int J Med Arom Plants*, 1(3) (2011) 228-233.

18 Sharma Jyotsana, Gairola S, Gaur RD & Painuli RM, The treatment of jaundice with medicinal plants in indigenous

communities of the Sub-Himalayan region of Uttarakhand, India. *J Ethnopharmacol,* 143(1) (2012) 262-291.

19 Sharma Jyotsana, Gaur RD & Painuli RM, Folk Herbal Medicines Used by the *Gujjar* Tribe of Sub-Himalayan Tracts, Uttarakhand, *J Econ Taxon Bot*, 35(1) (2011) 224-230.

20 Sharma Jyotsana, Gairola S, Gaur RD & RM Painuli, Forest utilization pattern and socio-economic status of Van-*Gujjar* tribe in Sub-Himalayan tracts of Uttarakhand, India: A case study, *Forestry Studies in China,* 14 (1) (2012) 36–46.

21 Arya KR & Agarwal SC, Folk therapy for eczema, bone fracture, boils, sores and gingivitis in Taragtal province of Uttarakhand, *Indian J Tradit Knowle*, 7(3) (2008) 443-445.

22 Chopda MZ & Mahajan, RT, Wounds healing plants of Jalgaon district of Maharashtra state, India, *Ethnobot Leaflets,* 13 ( 2009) 1-32.

23 Jyothi B, Sudarsanam G, Sitaram Bulusu, Prasada Babu G & Yasodamma N, Ethnobotanical Survey of Medicinal Plants Used in the Treatment of Dermatogenic Diseases in Chittoor District, Andhra Pradesh, India, *Ethnobot Leaflets*, 14 (2010) 511-517.

24 Lal Brij & Singh KN, Indigenous herbal remedies used to cure skin disorders by the natives of Lahaul-Spiti in Himachal Pradesh, *Indian J Tradit Knowle*, 7(2) (2008) 237-241.

25 Prashantkumar P & Vidhyasagar GM. Traditional knowledge on medicinal plants used for treatment of skin diseases in Bidar district, Karnataka, *Indian J Tradit Knowle*, 7(2) (2008) 273-276.

26 Nagori BP & Solanki Renu, Role of medicinal plants in wound healing, *Res J Med Pl*, 5(4) (2011) 392-405.

27 Abbasi AM, Khan MA, Ahmad M, Zafar M, Jahan S & Sultana S, Ethnopharmacological application of medicinal plants to cure skin diseases and in folk cosmetics among the tribal communities of NorthWest Frontier Province, Pakistan, *J Ethnopharmacol*, 128 (2010) 322-335.

28 Silverman D, *Doing qualitative Research: A Practical Handbook*, (Thousand Oaks, SAGE, London), 2005.

29 Gaur RD, Herbarium: An Important Asset for Economic and Ethnobotanical Studies, In: *Flower: Retrospect and Prospect*, edited by Y Vimla, (S R Scientific Publication, Delhi), 2009, 108-123.

30 Jain SK & Rao RR, *A Hand Book of Field and Herbarium Methods*, (Today's and Tomorrow's Printers and Publishers, New Delhi), 1977.

31 Singh HB & Subramanium B, *Field Manual of Herbarium Techniques*, (NISCAIR, New Delhi), 2008.

32 Wealth of India – *Raw Materials,* Vol. I-XI, (Publication and Information Directorate, CSIR, New Delhi), 1952-1988.