

Medicinal plant remedies for dermatological problems

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ABSTRACT

This study has been undertaken to document the medicinal plants used to take care of various dermatological problems - such as cuts, burns, itching, abscesses, allergies etc. in district Mandi of Himachal Pradesh (India). A total of 1000 respondents were contacted to gather this information using a semi-structured questionnaire. This study has highlighted the use of 168 species belonging to 148 genera and 67 families for the purpose under consideration. Most of the plants were herbs followed by shrubs, trees, climber, and liana. Leaves were the most frequently used plant part. Medicinal preparations include paste, juice, powder etc. It indicates that the respondents have sound knowledge about the medicinal plants and their utility.

KEY WORDS: Ethnobotany, Himachal Pradesh, Mandi, medicinal potential, plant species, skin problems

INTRODUCTION

Ethnobotanical knowledge related to medicinal plants may add new discoveries to the world of medicines. Plant-based medicines are considered cost-effective and safe as compared to synthetic drugs. Furthermore, people gain economic benefits by collecting medicinal plants from the forests and selling them in market (Lazarou *et al.*, 1998; White *et al.*, 1999; Uniyal and Shiva, 2005). This has elevated the growth of herbal medicine industries. Many plant species are yet to be explored, especially for their various medicinal activities. Most of the information is still restricted to some traditional healers or passed on to next generation by word of mouth or even lost (Akharaiyi and Boboye, 2010; Yirga, 2010). Therefore, it is of immense importance to conserve this precious knowledge before it vanished. The documentation and identification of plants are very important, not only for their utilization but conservation also (Muthu *et al.*, 2006). The skin is an effective protective system. It protects the body from various infections by inhibiting the entry of pathogens. However, some of the pathogens and environmental conditions may cause problems such as eczema, leucoderma, wounds, and itching (Govindasamy and Arulpriya, 2013; Suresh *et al.*, 2012). Previously, ethnobotanical studies, related to dermatological problems have also been conducted in different countries on the use of plants to treat various skin diseases (Joshi and Joshi,

2007; Njoroge and Bussmann, 2007; Abbasi *et al.*, 2010; Wet *et al.*, 2013; Sirsawat *et al.*, 2016).

MATERIALS AND METHODS

Study Area

This study has been undertaken in district Mandi of Himachal Pradesh. The district lies between 31°13'50" and 32°04'30" N latitude and between 76°37'20" and 77°23'15" E longitude. The total geographical area of the district is 3951 km² which is 7.1% of area of state. The average annual rainfall is about 1331.50 mm (Central Ground Water Board, 2013). The prevailing variety of climatic conditions has enriched the study area with floristic diversity. The district is comprised of 10 tehsils. Ethnobotanical survey for this study was conducted using method followed by Sidhu and Thakur (2015). The respondents were interviewed for the use of plants species for various dermatological problems such as burns, cuts, pimples, wounds etc.

Plant species were photographed during the flowering or fruiting seasons using Samsung PL50 digital camera preferably in their natural habitats. The plants which were difficult to identify from the photographs were collected as a specimen. Later, they were identified with the help of specimens present in a herbarium, Department of Botany, Panjab University, Chandigarh; Herbal Garden

and Herbarium, Research Institute in Indian System of Medicine, Joginder Nagar. The voucher specimens (of 76 species) were pressed, dried, labeled, and deposited in the herbarium of Department of Botany, Panjab University, Chandigarh.

RESULTS AND DISCUSSION

A total of 168 plant species from 148 genera and 67 families were used for the treatment of various skin problems. The families, botanical names, local names, habit, source, method of preparation, and uses are given in Table 1. The families - such as Lamiaceae, Asteraceae, and Fabaceae - have contributed 13, 12, and 10 members, respectively (Table 2). The main source was wild species

(127) followed by cultivated (33) species. Four species occur both in wild as well as cultivated state whereas the products of remaining four were purchased from the market. The herbs (72) were dominating among the reported plant species (Figure 1).

All the recorded plant species (168) were useful in the treatment of more than 28 skin related problems including abscesses, burns, itching, pimple, skin rashes, urticaria, warts etc. Maximum number of species (58) were used to treat abscesses followed by cuts (57), burns (38), fungal infection on toes (19), irritation/itching (17), and so on (Figure 2). *Ajuga parviflora* and *Aloe vera* were used to remove dark scars from burns. Nine remedies were available for the treatment of

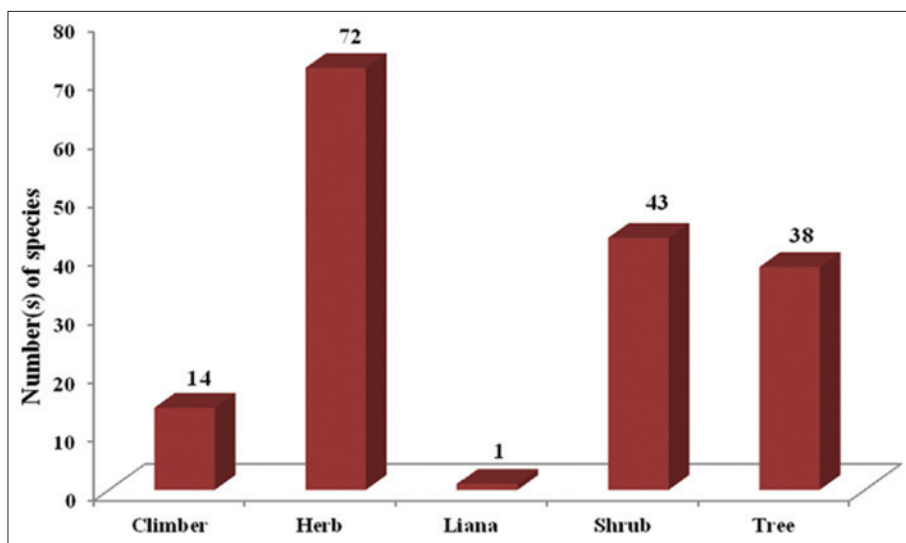


Figure 1: Habits of medicinal plants

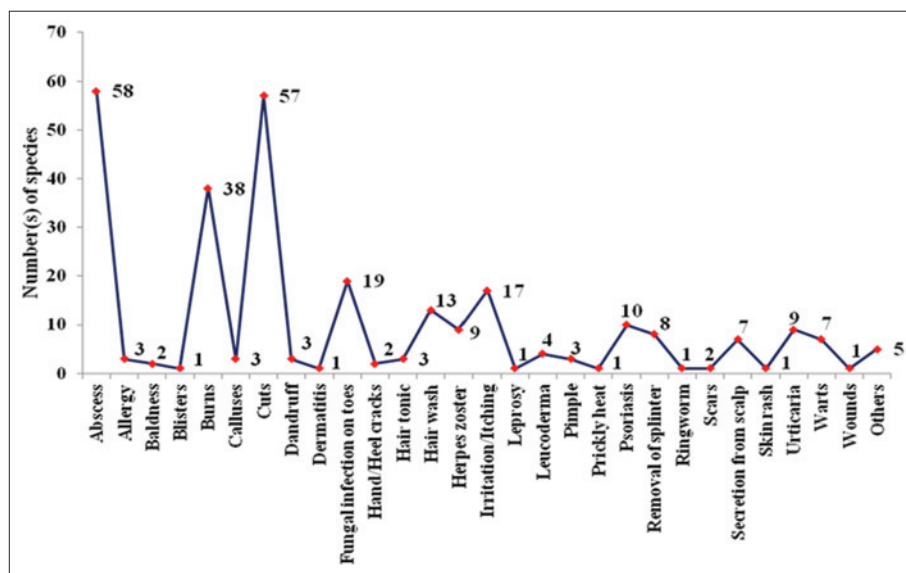


Figure 2: Number of plant species to cure various skin problems

Table 1: Plant species for dermatological problems

Families/botanical name of plants	Local name	Ht/Sc	Part used and preparation (application/s)
Acanthaceae			
<i>D. bupleuroides</i> Nees	Suandi	H/W	Leaf paste (abscesses)
<i>J. adhatoda</i> L.	Basuti	S/W	Roots and leaves paste (cuts) Warm leaves (abscesses)
Amaranthaceae			
<i>A. aspera</i> L.	Puthkanda	H/W	Leaf juice (cuts)
<i>A. bidentata</i> Blume	Umbal koori	H/W	Root paste (abscesses)
<i>C. tomentosa</i> (Roth) Moq.	Koori	S/W	Paste of whole plant (cuts)
<i>D. amaranthoides</i> (Lam.) Merr.	Bhirange	S/W	Leaf paste (abscesses)
Amaryllidaceae			
<i>A. cepa</i> L.	Pyaz	H/C	Pounded bulb is tied (abscesses)
<i>Z. carinata</i> Herb.	Yaadu	H/W	Paste is made by crushing small part of bulbs with seeds of <i>S. mukorossi</i> and <i>V. mungo</i> and mixing with gel of <i>A. vera</i> (abscesses)
Anacardiaceae			
<i>M. indica</i> L.	Aamb	T/C	Fruit stalk exudates (calluses) Dry fruit pieces are fried in mustard oil to make paste (skin burns) Kernel paste (cuts)
Apiaceae			
<i>C. asiatica</i> (L.) Urb.	Brahmi	H/W	Leaf juice (cuts) Leaf paste (abscesses, itching) Leaf paste (burns, urticaria) Leaves are given with black pepper and butter (leucoderma) Leaf paste (cuts)
<i>C. sativum</i> L.	Been	H/C	Leaf paste (cuts)
Apocynaceae			
<i>C. procera</i> (Aiton) Dryand.	Aak	S/W	Leaf paste (skin burns) Latex (warts)
<i>C. spinarum</i> L.	Garna	S/W	Latex (calluses, warts, remove splinters, skin blisters)
<i>C. roseus</i> (L.) G. Don	Sadabahar	S/C	Leaf paste is applied with black pepper (psoriasis)
<i>C. dubia</i> (Burm. f.) M. R. Almeida	Khurma	L/W	Kernel paste (Skin diseases)
Araceae			
<i>A. tortuosum</i> (Wall.) Schott	Jhangas	H/W	Tuber paste with black pepper (abscesses) Leaf paste (leucoderma)
<i>C. esculenta</i> (L.) Schott	Kachalu, beju	H/C	Warm leaves (fungal infection of toes) Water exudates (warts)
Arecaceae			
<i>C. nucifera</i> L.	Nariyal	T/M	Oil (skin burns)
Asparagaceae			
<i>A. racemosus</i> Willd.	Sainsor booti	Cl/W	Leaf paste (skin burns) Crushed fruits are mixed in water to make froth and applied on scalp (wash hair)
<i>D. indica</i> (Roxb.) Jessop	Ban-pyaz	H/W	Bulb paste (abscesses)
Asteraceae			
<i>A. adenophora</i> (Spreng.) R. M. King and H. Rob.	Baslo ghaas	S/W	Leaf paste (cuts)
<i>A. conyzoides</i> (L.) L.	Ujaru	H/W	Leaf juice (cuts)
<i>A. nilagirica</i> (C. B. Clarke) Pamp.	Kubsha	S/W	Leaf juice (cuts)
<i>A. vulgaris</i> L.	Charmara	S/W	Leaf juice (cuts)
<i>B. anthelmintica</i> (L.) Moench	Brahmjiri	H/W/C	Crushed seeds are eaten with black pepper and honey (abscesses, itching) Seed paste is applied with mustard oil (itching)
<i>C. minima</i> (L.) A. Braun and Asch.	Nk-chikku	H/W	Whole plant paste (abscesses)
<i>E. prostrata</i> (L.) L.	Bhringraj	H/W	Crushed seeds are warmed in mustard oil and applied on scalp (hair tonic)
<i>G. gossypina</i> (Royle) Beauverd	Baacha	H/W	Leaf paste (cuts)
<i>T. erecta</i> L.	Sartaj	S/C	Inflorescence paste (skin burns)
<i>T. patula</i> L.	Sutajri, golu, dolari	S/C	Leaf juice (cuts) Leaf paste (pimples, skin burns)
<i>T. campylodes</i> G. E. Haglund	Dudhali	H/W	Latex (cuts)
<i>T. procumbens</i> (L.) L.	Phulnu	H/W	Crushed plant is taken as such or made into tablets with black pepper (abscesses, herpes zoster)
Balsaminaceae			
<i>I. balsamina</i> L.	Dioond	H/W	Leaf paste (fungal infection of toes)
Berberidaceae			
<i>B. aristata</i> DC.	Kashmal	S/W	Cold decoction of roots is used dermally (cuts, itching)
Bignoniaceae			
<i>O. indicum</i> (L.) Kurz.	Arlu	T/W	Crushed seeds are warmed in oil (dermatitis) Bark powder mixed with sesame oil (psoriasis)

(Contd...)

Table 1: (Continued)

Families/botanical name of plants	Local name	Ht/Sc	Part used and preparation (application/s)
Bombacaceae			
<i>B. ceiba</i> L.	Semul	T/W	Leaf paste (cuts) Thorns are scrubbed to form paste (abscesses)
Boraginaceae			
<i>C. zeylanicum</i> (Vahl) Brand	Koori	H/W	Root paste (abscesses) Leaf juice (cuts) Leaf paste (fungal infection of toes)
Brassicaceae			
<i>B. rapa</i> L.	Saron	H/C	Seed oil (itching) Oil with turmeric powder (skin burns)
<i>E. vesicaria</i> (L.) Cav.	Taara-mira	H/C	Crushed seeds are added to warm oil (itching)
Cannabaceae			
<i>C. sativa</i> L.	Bhaang, bhangolu, vijaya	H/W	Leaves paste (urticaria, skin irritation caused due to <i>U. dioica</i>)
Caprifoliaceae			
<i>V. jatamansi</i> Jones	Nihani	H/W	Roots and leaves paste (cuts)
Caricaceae			
<i>C. papaya</i> L.	Papita	T/C	Latex (psoriasis)
Combretaceae			
<i>T. arjuna</i> (Roxb. ex DC.) Wight and Arn.	Arjun	T/C	Leaf paste; bark powder mixed with clarified butter (skin burns)
<i>T. chebula</i> Retz.	Harar	T/W	Fruit paste (fungal infection of toes)
Convolvulaceae			
<i>C. reflexa</i> Roxb.	Akashbel	CI/W	Plant juice (warts) Plant paste (herpes zoster, urticaria) Plant mixed in mustard oil (hair tonic)
<i>I. nil</i> (L.) Roth	Ghaundani	CI/W	Seeds are pounded and dissolved in water (wash hair)
Crassulaceae			
<i>B. pinnatum</i> (Lam.) Oken	Patharchat, lusgadu	H/C	Leaf juice (cuts) Leaves are smeared with warm mustard oil (abscesses)
<i>S. glaucophyllum</i> R. T. Clausen	Ludru	H/W	Leaf paste (burns, cuts, abscesses)
Cucurbitaceae			
<i>C. sativus</i> L.	Kakdi	CI/C	Fruit juice (skin burns)
<i>C. sativus</i> var. <i>hardwickii</i> (Royle) Gabaev	Fafanu	CI/W	Fruits paste (cuts) Warm fruit is applied with jaggery (abscesses)
<i>L. siceraria</i> (Molina) Standl.	Ghiya	CI/C	Fruit peel (skin burns)
Dioscoreaceae			
<i>D. deltoidea</i> Wall. ex Griseb.	Shingli-mingli	CI/W	Dry rhizomes are pounded, dissolved in water and froth is applied on scalp (wash hair)
Ericaceae			
<i>L. ovalifolia</i> (Wall.) Drude	Bheral	T/W	Young twigs are crushed with young twigs of <i>P. pashia</i> and mixed in mustard oil (itching)
<i>R. campanulatum</i> D. Don.	Shargar	S/W	Leaf paste (urticaria)
Euphorbiaceae			
<i>E. helioscopia</i> L.	Dudhali	H/W	Stem paste (secretion from scalp) Latex (cuts)
<i>E. heterophylla</i> L.	Dudhali	H/W	Latex (cuts)
<i>E. hirta</i> L.	Dudhali	H/W	Leaf paste (abscesses) Latex (cuts, hand cracks)
<i>E. royleana</i> Boiss.	Chhunha	S/W	Small pieces of stem are fried in mustard oil till amount of oil reduced to 1/10 th of the original (itching, ringworm) Latex (cuts, abscesses, remove splinter)
<i>F. insignis</i> Royle	Dudhla, balodhar	T/W	Latex, for short time (psoriasis, warts)
<i>J. curcas</i> L.	Japhlota	S/W	Crushed seeds are dissolved in water to form froth which is applied on scalp (wash hair)
<i>M. philippensis</i> (Lam.) Mull. Arg.	Kamahl	T/W	Latex (warts, fungal infection of toes, cuts) Leaf juice (itching (caused by fruits of <i>M. pruriens</i>)) Glandular hairs (wounds formed by infection due to spine, skin or scalp in itching problem)
<i>R. communis</i> L.	Airn	S/W	Leaves are rubbed over hands and feet (burning sensation) Seed paste (heel cracks)
Fabaceae			
<i>A. precatorius</i> L.	Chadainu	CI/W	Seed paste (abscesses, leucoderma)
<i>A. gageana</i> Craib	Darnghodi, bagharne	S/W	Leaf paste (cuts) Leaf powder is mixed with water (skin burns)
<i>B. variegata</i> L.	Karalein	T/W	Juice of twigs (skin burns)

(Contd...)

Table 1: (Continued)

Families/botanical name of plants	Local name	Ht/Sc	Part used and preparation (application/s)
<i>B. monosperma</i> (Lam.) Taub.	Palah	S/C	Flower paste is made by crushing with flowers of <i>H. rosa-sinensis</i> (baldness)
<i>C. fistula</i> L.	Aali	T/W	Young leaves paste (fungal infection of toes)
<i>C. corylifolium</i> (L.) Medik.	Babchi	H/C	Leaf paste (leucoderma)
<i>I. heterantha</i> Brandis	Kaathi	S/W	Leaf paste (fungal infection of toes)
<i>L. culinaris</i> Medik.	Massar	H/C	Paste of roasted seeds (skin burns, secretion from scalp)
<i>S. tora</i> (L.) Roxb.	Reli	H/W	Crushed seeds are applied with mustard oil (abscesses)
<i>V. mungo</i> (L.) Hepper	Maah	H/C	Small amount of bulb of <i>Z. carinata</i> is crushed with seeds of <i>S. mukorossi</i> and <i>V. mungo</i> and mixed with <i>A. vera</i> gel to form paste (abscesses)
Fagaceae			
<i>Q. incana</i> Bartram	Baan	T/W	Ash of twigs (wash hair)
Hypericaceae			
<i>H. uralum</i> Buch.-Ham. ex D. Don	Khradu	S/W	Leaf paste (cuts)
Juglandaceae			
<i>J. regia</i> L.	Akhrot, khod	T/W/C	Paste of fruit covering (fungal infection of toes)
Lamiaceae			
<i>A. parviflora</i> Benth.	Neelkanthi	H/W	Leaf juice (skin burns, removes dark scars, itching due to allergic reactions) Leaf paste (herpes zoster, abscesses, fungal infection of toes) Leaves crushed in mustard oil (remove dandruff) Whole plant paste (cuts)
<i>C. tomentosa</i> (L.) L.	Dushti	S/W	Juice of young leaves (cuts)
<i>C. umbrosum</i> (M. Bieb.) Kuntze	Barua	H/W	Leaf paste (cuts)
<i>C. oppositifolia</i> Sm.	Gadoosa	S/W	Leaf juice (cuts) Leaf paste (urticaria)
<i>I. wightii</i> (Benth.) H. Hara	Kngaara	S/W	Leaf paste (fungal infection of toes)
<i>L. lanata</i> Benth.	Dhurlu ghaas	H/W	Paste is made by crushing its leaves with whole plant of <i>Peperomia tetraphylla</i> and <i>Ajuga parviflora</i> (abscesses)
<i>M. biflora</i> (Buch.-Ham. ex D. Don) Benth.	Marua	H/W	Leaf paste (wounds)
<i>P. mollis</i> (Aiton) Spreng.	Banbhabri	S/W	Leaf juice (skin burns, cuts)
<i>P. benghalensis</i> (Burm. f.) Kuntze	Kaali bansuti, bhrmayara	S/W	Leaf paste (cuts, fungal infection of toes) Leaf paste (psoriasis)
<i>P. mollissima</i> Roth	Bakar	T/W	Leaf paste (psoriasis) Leaves chutney is eaten (itching)
<i>R. cinerea</i> (D. Don) Baill.	Kadkoi, kdkhre, kadwo, itsri	S/W	Leaf paste (abscesses, itching) Paste is made by crushing its leaves with leaves of <i>C. asiatica</i> and <i>A. parviflora</i> (secretion from scalp)
<i>S. scandens</i> D. Don	Chhichad	S/W	Leaf paste (fungal infection of toes)
<i>V. negundo</i> L.	Sura, bnah	S/W	Leaf juice (cuts) Leaf paste (fungal infection of toes)
Lauraceae			
<i>C. tamala</i> (Buch.-Ham.) T. Nees & Eberm.	Gudpatraj	T/W	Leaf decoction (dandruff)
Linaceae			
<i>L. usitatissimum</i> L.	Alsi	H/C	Ripened fruit of <i>C. annuum</i> is fried in its oil and pounded into paste (cuts)
<i>R. indica</i> Dumort.	Piyein-re-phool	H/W	Leaf and stem paste (cuts)
Lythraceae			
<i>L. inermis</i> L.	Mehndi	T/M	Leaf paste (skin burns)
<i>P. granatum</i> L.	Daru	S/W	Pericarp paste (fungal infection of toes)
Malvaceae			
<i>G. optiva</i> J. R. Drumm. ex Burret	Byul	T/W	Young twig paste (cuts) Young twigs are crushed and dissolved in water which is applied on scalp (wash hair)
<i>H. rosa-sinensis</i> L.	Gurhal	S/C	Flower paste is made by crushing with flowers of <i>B. monosperma</i> (baldness)
<i>S. cordifolia</i> L.	Daridein	H/W	Leaf juice (cuts) Leaf paste (abscesses)
Melanthiaceae			
<i>T. govianum</i> Wall. ex D. Don	Naag chatri	H/W	Root paste (cuts)
Meliaceae			
<i>A. indica</i> A. Juss.	Neem	T/C	Leaf paste (fungal infection of toes, skin burns, secretion from scalp in children)
<i>M. azedarach</i> L.	Darek	T/W	Leaf extract is mixed with oil (hair tonic)

(Contd...)

Table 1: (Continued)

Families/botanical name of plants	Local name	Ht/Sc	Part used and preparation (application/s)
Menispermaceae			
<i>C. pareira</i> L.	Patindu		Root and leaves paste (abscesses) Leaves are smeared with warm mustard oil (abscesses) Whole plant paste (skin burns) Paste of fresh leaves (cuts)
<i>C. laurifolius</i> DC.	Parora	S/W	Leaves and bark paste is mixed with black pepper (secretion from scalp)
<i>S. glabra</i> (Roxb.) Miers	Bish khapra	Cl/W	Tuber paste (abscesses)
Moraceae			
<i>F. auriculata</i> Lour.	Tryambla, debra	T/W	Latex (cuts, remove splinter)
<i>F. benghalensis</i> L.	Bar	T/W/C	Decoction of crushed prop roots (wash hair) Latex (cuts)
<i>F. carica</i> L.	Khasra	T/W	Latex (remove splinter, calluses)
<i>F. palmata</i> Forssk.	Faigra	T/W	Latex (cuts, itching, remove splinter)
<i>F. racemosa</i> L.	Umraya	T/W	Leaf juice (skin burns) Latex (warts)
<i>F. religiosa</i> L.	Peepal	T/W/C	Paste of bark is applied with jaggery (abscesses) Latex (leprosy)
<i>M. serrata</i> Roxb.	Cheemu	T/W	Resin (cuts)
Musaceae			
<i>M. paradisiaca</i> L.	Kela	H/C	Leaf juice (skin burns)
Myrtaceae			
<i>S. aromaticum</i> (L.) Merr. & L. M. Perry	Laung	T/M	Paste flower bud (abscesses)
Nyctaginaceae			
<i>M. jalapa</i> L.	Gulabaans, daini-phool	S/W	Root paste (abscesses)
Oleaceae			
<i>J. mesnyi</i> Hance	Chameli	Cl/C	Leaf paste (cuts)
Orchidaceae			
<i>A. multiflora</i> Roxb.	Bhangru	H/W	Leaf juice (cuts) Leaf juice is mixed with clarified butter and applied (skin burns)
Oxalidaceae			
<i>O. corniculata</i> L.	Malori	H/W	Whole plant juice (remove splinter) Whole plant paste (abscesses, skin burns, prickly heat)
Pedaliaceae			
<i>S. indicum</i> L.	Til	S/C	Pounded leaves are dissolved in water (wash hair)
Phyllanthaceae			
<i>P. emblica</i> L.	Amla	T/W	Leaf paste (fungal infection of toes) Fruit paste (skin burns)
<i>P. niruri</i> L.	Bhui amla	H/W	Whole plant paste (skin burns)
Piperaceae			
<i>P. tetraphylla</i> (G. Forst.) Hook. and Arn.		H/W	Paste is made by crushing whole plant with leaves of <i>L. lanata</i> and <i>A. parviflora</i> (abscesses)
<i>P. nigrum</i> L.	Kali mirch	Cl/M	Crushed fruits is applied with mustard oil (itching) Fruit powder is given with clarified butter (urticaria)
Plantaginaceae			
<i>P. depressa</i> Willd.	Chasha	H/W	Leaves are smeared with warm mustard oil (abscesses)
Plumbaginaceae			
<i>P. zeylanica</i> L.	Chitra	S/W	Root paste (applied for very short time) (itching) Roots are scrubbed with water (skin diseases)
Poaceae			
<i>C. dactylon</i> (L.) Pers.	Doob	H/W	Plant juice (skin burns, cuts)
<i>D. falcatum</i> (Nees) Keng f.	Dhadhanj, nigaal, gohra	H/W	Leaves are boiled with leaves of <i>P. mollissima</i> and extract is used to take bath (urticaria)
<i>E. coracana</i> (L.) Gaertn.	Kodra, mandal	H/C	Seed paste (herpes zoster)
<i>T. aestivum</i> L.	Kanak	H/C	Wheat flour is applied dermally (skin burns) Wheat flour is fried to make "Halwa." It is cooled and applied dermally (remove splinter) Wheat germ oil (psoriasis)
<i>Z. mays</i> L.	Chhalli	H/C	Water is added to the stem ash to obtain lye which is applied on scalp (wash hairs)
Polygonaceae			
<i>P. amplexicaulis</i> (D. Don) Ronse Decr.	Dora	H/W	Root paste (abscesses)
<i>P. capitata</i> (Buch.-Ham. ex D. Don) H. Gross	Chasha	H/W	Leaf powder (cuts)

(Contd...)

Table 1: (Continued)

Families/botanical name of plants	Local name	Ht/Sc	Part used and preparation (application/s)
<i>R. nepalensis</i> Spreng.	Albar, Marli	H/W	Root paste (abscesses, fungal infection) Leaves are folded, warmed and kept on infected portion (remove splinter) Leaves are warmed along with leaves of <i>N. tabacum</i> and kept (abscesses)
Ranunculaceae			
<i>R. acris</i> L.	Meenkli, Jakri	H/W	Paste of roots and leaves is applied after 3 days of injury (cuts, bone fracture)
<i>R. arvensis</i> L.	Jaldar	H/W	Whole plant paste, for very short time (psoriasis)
Rosaceae			
<i>F. vesca</i> L.	Bhui akha, laal aakhe	H/W	Paste of whole plant with black pepper {abscesses (on forehead)} Whole plant paste (skin burns)
<i>P. supina</i> L.	Oolti kuri	H/W	Root bark paste (abscesses)
<i>P. utilis</i> Royle	Bhekhal	S/W	Root ash (abscesses)
<i>P. cerasoides</i> Buch.-Ham. ex D. Don	Pajja	T/W	Flowers paste mixed with curd and used (skin burns)
<i>P. pashia</i> Buch.-Ham. ex D. Don	Kainth, shegal	T/W	Paste of young twigs and fresh leaves (fungal infection of toes)
<i>R. ellipticus</i> Sm.	Aakhe, heer	S/W	Root paste (skin burns) Leaf paste (cuts, fungal infection of toes)
Rubiaceae			
<i>C. spinosa</i> (Thunb.) Tirveng.	Raada	S/W	Fruits paste (skin rashes, pimples) Fruits are crushed, dissolved in water to obtain froth which is used (wash hair)
<i>G. aparine</i> L.	Chirmitti, tushusho	H/W	Paste of aerial parts (abscesses, cuts, herpes zoster)
<i>H. tetrasperma</i> (Wall. ex Roxb.) T. Yamaz		S/W	Leaf paste (herpes zoster)
Rutaceae			
<i>C. limon</i> (L.) Osbeck	Nimbu	T/C	Fruit juice is applied in infected area and left for 2-3 hours. It is washed with water and butter is applied. The process is repeated for 7 days (psoriasis)
<i>C. pseudolimon</i> Tanaka	Khatta	T/C	Fruit juice (Skin burns) Warm fruit (Abscesses)
Salicaceae			
<i>F. indica</i> (Burm. f.) Merr.	Kangu	T/W	Bark ash is applied with mustard oil (abscesses) Thorn is scrubbed and paste is applied (abscesses)
<i>S. babylonica</i> L.	Majnu	T/W	Crushed young twigs are dissolved in water to form froth which is applied on scalp (wash hair)
Sapindaceae			
<i>A. indica</i> (Wall. ex Cambess.) Hook.	Kanor	T/W	Fruits are crushed and dissolved in water (wash hair) Bark paste (abscesses)
<i>D. viscosa</i> (L.) Jacq.	Mehandru	S/W	Wet twigs are heated to collect sap which is used dermally (skin problems) Leaf powder and paste (skin burns)
<i>S. mukorossi</i> Gaertn.	Dodae, ritha	T/W	Fruits are crushed and dissolved in water (wash hair)
Saxifragaceae			
<i>B. ciliata</i> (Haw.) Sternb.	Pathrkhar, sapdottar, mehlu, shabla	H/W	Root paste (abscesses)
Scrophulariaceae			
<i>B. crispa</i> Benth.	Sandhyara	S/W	Leaf paste (skin burns and cuts)
Smilacaceae			
<i>S. aspera</i> L.	Kukru	CI/W	Paste of aerial parts (abscesses)
Solanaceae			
<i>C. annuum</i> L.	Peepli	H/C	Leaf paste (skin burns) Ripened fruit is fried in <i>L. usitatissimum</i> oil, pounded into paste (cuts)
<i>N. physalodes</i> (L.) Gaertn.	Gheyien	S/W	Root paste (abscesses) Leaf paste (allergy)
<i>N. tabacum</i> L.	Tambaku	H/W	Warm leaves are applied with jaggery (abscesses)
<i>P. minima</i> L.	Phophal-ghaien	H/W	Fruit paste (skin burns, cuts, herpes zoster, problem of secretion from scalp)
<i>S. aculeatissimum</i> Jacq.	Kanteri	S/W	Fruit and seed paste (abscesses)
<i>S. americanum</i> Mill.	Pattghaien	S/W	Leaf paste (urticaria, cuts) Paste is made by crushing leaves and fruits with roots of <i>P. benghalensis</i> and black pepper (herpes zoster, skin diseases) Whole plant paste (skin burns) Whole plant is crushed (abscesses)
<i>S. melongena</i> L.	Baingan	S/C	Stem ash (abscesses)
<i>S. tuberosum</i> L.	Aalu	H/C	Tuber is pounded (skin burns)

(Contd...)

Table 1: (Continued)

Families/botanical name of plants	Local name	Ht/Sc	Part used and preparation (application/s)
Urticaceae			
<i>B. macrophylla</i> Hornem.	Chamrala, kalotra	H/W	Juice of young leaves (skin burns, cuts) 8-10 leaves are pounded into paste with 2-3 black pepper (herpes zoster)
<i>G. hirta</i> (Blume ex Hassk.) Miq.	Kurand	H/W	Leaf paste (abscesses) Root paste (abscesses)
<i>U. dioica</i> L.	Ainn	H/W	Leaves are pounded with seeds of <i>L. usitatissimum</i> and jaggery into paste (abscesses) Leaf paste (itching) Leaves are eaten as vegetable or chutney (allergy)
Violaceae			
<i>V. pilosa</i> Blume	Banafsha, phali	H/W	Roots and leaves paste (cuts) Leaf paste (abscesses) Whole plant paste (pimples)
Vitaceae			
<i>P. semicordata</i> (Wall.) Planch.	Amru-ri-bail	Cl/W	Stem bark paste (abscesses)
Xanthorrhoeaceae			
<i>A. vera</i> (L.) Burm. f.	Kaware	H/C	Warm leaf gel (abscesses) Gel (Remove dark scars, skin burns, dandruff)
Zingiberaceae			
<i>C. angustifolia</i> Roxb.		H/W	Rhizome paste (abscesses)
<i>C. longa</i> L.	Haldi	H/C	Rhizome powder (cuts)
<i>H. spicatum</i> Sm.	Shati, banhaldi, shya, shroli	H/W	Rhizome paste (abscesses)

Ht/Sc: Habit/Source, H: Herb, S: Shrub, T: Tree, Cl: Climber, L: Liana, W: Wild, C: Cultivated, M: Market, W/C: Wild/Cultivated,
D. bupleuroides: *Dicliptera bupleuroides*, *J. adhatoda*: *Justicia adhatoda*, *A. aspera*: *Achyranthes aspera*, *A. bidentata*: *Achyranthes bidentata*,
C. tomentosa: *Cyathula tomentosa*, *D. amaranthoides*: *Deeringia amaranthoides*, *A. cepa*: *Allium cepa*, *Z. carinata*: *Zephyranthes carinata*,
M. indica: *Mangifera indica*, *C. asiatica*: *Centella asiatica*, *C. sativum*: *Coriandrum sativum*, *C. procera*: *Calotropis procera*, *C. spinarum*: *Carissa spinarum*,
C. roseus: *Catharanthus roseus*, *C. dubia*: *Cryptolepis dubia*, *A. tortuosum*: *Arisaema tortuosum*, *C. esculenta*: *Colocasia esculenta*,
C. nucifera: *Cocos nucifera*, *A. racemosus*: *Asparagus racemosus*, *D. indica*: *Drimys indica*, *A. adenophora*: *Ageratina adenophora*, *A. conyzoides*:
Ageratum conyzoides, *A. nilagirica*: *Artemisia nilagirica*, *A. vulgaris*: *Artemisia vulgaris*, *B. anthelmintica*: *Baccharoides anthelmintica*,
C. minima: *Centipeda minima*, *E. prostrata*: *Eclipta prostrata*, *G. gossypina*: *Gerbera gossypina*, *T. erecta*: *Tagetes erecta*, *T. patula*: *Tagetes patula*,
T. campyloides: *Taraxacum campyloides*, *T. procumbens*: *Tridax procumbens*, *I. balsamina*: *Impatiens balsamina*, *B. aristata*: *Berberis aristata*,
O. indicum: *Oroxylum indicum*, *B. ceiba*: *Bombax ceiba*, *C. zeylanicum*: *Cynoglossum zeylanicum*, *B. rapa*: *Brassica rapa*, *E. vesicaria*:
Eruca vesicaria, *C. sativa*: *Cannabis sativa*, *V. jatamansi*: *Valeriana jatamansi*, *C. papaya*: *Carica papaya*, *T. arjuna*: *Terminalia arjuna*,
T. chebula: *Terminalia chebula*, *C. reflexa*: *Cuscuta reflexa*, *I. nil*: *Ipomoea nil*, *B. pinnatum*: *Bryophyllum pinnatum*, *S. glaucophyllum*: *Sedum glaucophyllum*,
C. sativus: *Cucumis sativus*, *L. siceraria*: *Lagenaria siceraria*, *D. deltoidea*: *Dioscorea deltoidea*, *L. ovalifolia*: *Lyonia ovalifolia*,
R. campanulatum: *Rhododendron campanulatum*, *E. helioscopia*: *Euphorbia helioscopia*, *E. heterophylla*: *Euphorbia heterophylla*, *E. hirta*:
Euphorbia hirta, *E. royleana*: *Euphorbia royleana*, *F. insignis*: *Falconeria insignis*, *J. curcas*: *Jatropha curcas*, *M. philippensis*: *Mallotus philippensis*,
M. pruriens: *Mucuna pruriens*, *R. communis*: *Ricinus communis*, *A. precatorius*: *Abrus precatorius*, *A. gageana*: *Acacia gageana*, *B. variegata*:
Bauhinia variegata, *B. monosperma*: *Butea monosperma*, *C. fistula*: *Cassia fistula*, *H. rosa-sinensis*: *Hibiscus rosa-sinensis*, *C. corylifolium*: *Cullen corylifolium*,
I. heterantha: *Indigofera heterantha*, *L. culinaris*: *Lens culinaris*, *S. tora*: *Senna tora*, *V. mungo*: *Vigna mungo*, *Q. incana*: *Quercus incana*,
H. uralum: *Hypericum uralum*, *J. regia*: *Juglans regia*, *A. parviflora*: *Ajuga parviflora*, *C. tomentosa*: *Callicarpa tomentosa*, *C. umbrosum*:
Clinopodium umbrosum, *C. oppositifolia*: *Colebrookea oppositifolia*, *I. wightii*: *Isodon wightii*, *L. lanata*: *Leucas lanata*, *M. biflora*: *Micromeria biflora*,
P. mollis: *Plectranthus mollis*, *P. benghalensis*: *Pogostemon benghalensis*, *P. mollissima*: *Premna mollissima*, *R. cinerea*: *Roylea cinerea*,
C. asiatica: *Centella asiatica*, *A. parviflora*: *Ajuga parviflora*, *S. scandens*: *Scutellaria scandens*, *V. negundo*: *Vitex negundo*, *C. tamala*: *Cinnamomum tamala*,
L. usitatissimum: *Linum usitatissimum*, *R. indica*: *Reinwardtia indica*, *L. inermis*: *Lawsonia inermis*, *P. granatum*: *Punica granatum*,
G. optiva: *Grewia optiva*, *H. rosa-sinensis*: *Hibiscus rosa-sinensis*, *S. cordifolia*: *Sida cordifolia*, *T. govanianum*: *Trillium govanianum*, *A. indica*:
Azadirachta indica, *M. azedarach*: *Melia azedarach*, *C. pareira*: *Cissampelos pareira*, *C. laurifolius*: *Cocculus laurifolius*, *S. glabra*: *Stephania glabra*,
F. auriculata: *Ficus auriculata*, *F. benghalensis*: *Ficus benghalensis*, *F. carica*: *Ficus carica*, *F. palmata*: *Ficus palmata*, *F. racemosa*: *Ficus racemosa*,
F. religiosa: *Ficus religiosa*, *M. serrata*: *Morus serrata*, *M. paradisiaca*: *Musa paradisiaca*, *S. aromaticum*: *Syzygium aromaticum*, *M. jalapa*:
Mirabilis jalapa, *J. mesnyi*: *Jasminum mesnyi*, *A. multiflora*: *Aerides multiflora*, *O. corniculata*: *Oxalis corniculata*, *S. indicum*: *Sesamum indicum*,
P. emblica: *Phyllanthus emblica*, *P. niruri*: *Phyllanthus niruri*, *P. tetraphylla*: *Peperomia tetraphylla*, *P. nigrum*: *Piper nigrum*, *P. depressa*: *Plantago depressa*,
P. zeylanica: *Plumbago zeylanica*, *C. dactylon*: *Cynodon dactylon*, *D. falcatum*: *Drepanostachyum falcatum*, *E. coracana*: *Eleusine coracana*,
T. aestivum: *Triticum aestivum*, *Z. mays*: *Zea mays*, *P. amplexicaulis*: *Persicaria amplexicaulis*, *P. capitata*: *Persicaria capitata*, *R. nepalensis*: *Rumex nepalensis*,
R. acris: *Ranunculus acris*, *R. arvensis*: *Ranunculus arvensis*, *F. vesca*: *Fragaria vesca*, *P. supina*: *Potentilla supina*, *P. utilis*: *Prinsepia utilis*,
P. cerasoides: *Prunus cerasoides*, *P. pashia*: *Pyrus pashia*, *R. ellipticus*: *Rubus ellipticus*, *C. spinosa*: *Catunaregam spinosa*, *G. aparine*: *Galium aparine*,
H. tetrasperma: *Himalrandia tetrasperma*, *C. limon*: *Citrus limon*, *C. pseudolimon*: *Citrus pseudolimon*, *F. indica*: *Flacourtia indica*, *S. babylonica*:
Salix babylonica, *A. indica*: *Aesculus indica*, *D. viscosa*: *Dodonaea viscosa*, *S. mukorossi*: *Sapindus mukorossi*, *B. ciliata*: *Bergenia ciliata*, *B. crispa*:
Buddleja crispa, *S. aspera*: *Smilax aspera*, *C. annuum*: *Capsicum annuum*, *N. physalodes*: *Nicandra physalodes*, *N. tabacum*: *Nicotiana tabacum*,
P. minima: *Physalis minima*, *Physalis minima*, *S. aculeatissimum*: *Solanum aculeatissimum*, *S. americanum*: *Solanum americanum*, *S. melongena*:
Solanum melongena, *S. tuberosum*: *Solanum tuberosum*, *B. macrophylla*: *Boehmeria macrophylla*, *G. hirta*: *Gonostegia hirta*, *U. dioica*: *Urtica dioica*,
V. pilosa: *Viola pilosa*, *P. semicordata*: *Parthenocissus semicordata*, *A. vera*: *Aloe vera*, *C. angustifolia*: *Curcuma angustifolia*, *C. longa*: *Curcuma longa*,
H. spicatum: *Hedychium spicatum*

Table 2: Families representing genera and species

Families	G*	S**
Acanthaceae	2	2
Amaranthaceae	3	4
Amaryllidaceae	2	2
Anacardiaceae	1	1
Apiaceae	2	2
Apocynaceae	4	4
Araceae	2	2
Arecaceae	1	1
Asparagaceae	2	2
Asteraceae	10	12
Balsaminaceae	1	1
Berberidaceae	1	1
Bignoniaceae	1	1
Bombacaceae	1	1
Boraginaceae	1	1
Brassicaceae	2	2
Cannabaceae	1	1
Caprifoliaceae	1	1
Caricaceae	1	1
Combretaceae	1	2
Convolvulaceae	2	2
Crassulaceae	2	2
Cucurbitaceae	3	3
Dioscoreaceae	1	1
Ericaceae	2	2
Euphorbiaceae	5	8
Fabaceae	10	10
Fagaceae	1	1
Hypericaceae	1	1
Juglandaceae	1	1
Lamiaceae	13	13
Lauraceae	1	1
Linaceae	2	2
Lythraceae	2	2
Malvaceae	3	3
Melanthiaceae	1	1
Meliaceae	2	2
Menispermaceae	3	3
Moraceae	2	7
Musaceae	1	1
Myrtaceae	1	1
Nyctaginaceae	1	1
Oleaceae	1	1
Orchidaceae	1	1
Oxalidaceae	1	1
Pedaliaceae	1	1
Phyllanthaceae	1	2
Piperaceae	2	2
Plantaginaceae	1	1
Plumbaginaceae	1	1
Poaceae	5	5
Polygonaceae	2	3
Ranunculaceae	1	2
Rosaceae	6	6
Rubiaceae	3	3
Rutaceae	1	2
Salicaceae	2	2
Sapindaceae	3	3
Saxifragaceae	1	1
Scrophulariaceae	1	1
Smilacaceae	1	1
Solanaceae	5	8
Urticaceae	3	3
Violaceae	1	1
Vitaceae	1	1
Xanthorrhoeaceae	1	1
Zingiberaceae	2	3

G*: Genera, S**: Species

herpes zoster among which *Physalis minima* and *Solanum americanum* were most commonly used. *Himalrandia tetrasperma* was equally important for the same purpose but less known to people. The fungal infection of toes was cured using 19 species amongst which *A. parviflora*, *Curcuma longa*, *Cynoglossum zeylanicum*, *Isodon wightii*, *Juglans regia*, *Pyrus pashia*, *Scutellaria scandens*, and *Terminalia chebula* were common.

Plant or plant parts were used in medicinal preparations as per formulation, individually or in mixture forms. According to Saikia *et al.* (2006), the plant species which were used singly must be of great interest for discoveries of new drugs. Leaves were used most frequently (45.23%) then roots (12.50%), fruits and seeds (11.90% each), latex (8.33%), stem/rhizome/tuber (7.14%), etc. (Figure 3). Leaves were also the most frequently used plant part in some previous ethnobotanical studies (Egharevba and Ikhata, 2008; Rahman, 2013; Jatav and Mehta, 2013). According to Wet *et al.* (2013), the use of leaves is helpful in sustainable development.

A species of multiple use require extra attention toward their conservation. It has been observed that same parts of certain species have been used to treat different skin diseases such as *Acacia gageana*, *Aerides multiflora*, *Centella asiatica*, *Colebrookea oppositifolia*, *Fragaria vesca*, *Sedum glaucophyllum*, *Tridax procumbens* etc. However, in some cases, different parts of single species were used against same skin related ailment such as *Cocculus laurifolius*, *P. pashia*, *Ranunculus acris*, *Terminalia arjuna* etc. Traditional remedies were prepared using suitable methods. The majority of the remedies were paste (108), juice (28), crush (24), etc. Powder, decoction, roasted forms were also taken (Figure 4). These preparations were taken with other additives such as butter, clarified butter (ghee), curd, black pepper, honey, jaggery, and water. Black pepper was the most commonly used additive. These may either be added to increase the effect of medicines or to reduce the toxicity in plants if any. This study suggests that respondents have sound ethnobotanical knowledge and they are passing it on to the next generations also.

CONCLUSION

A total of 168 species have been recorded for the treatment of dermatological problems. The information collected from respondents indicates that they are aware about medicinal plants and their uses. This knowledge was inherited from their ancestors but vanishing gradually

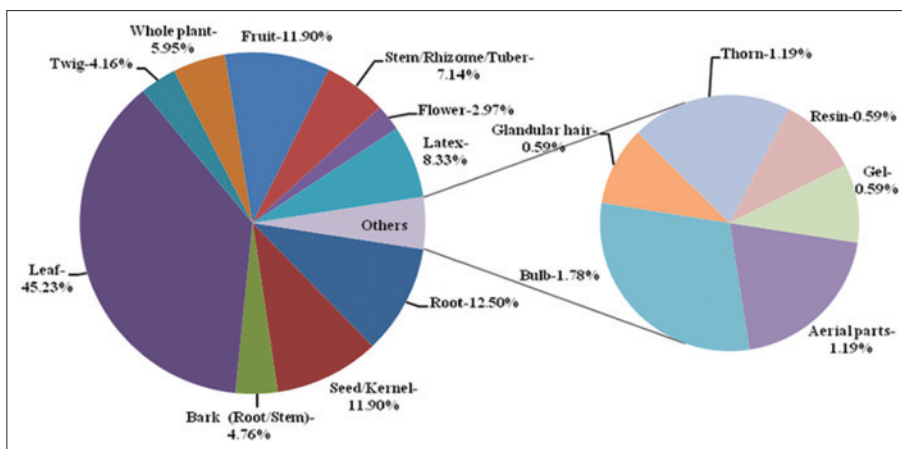


Figure 3: Various plant parts used in medicinal formulations

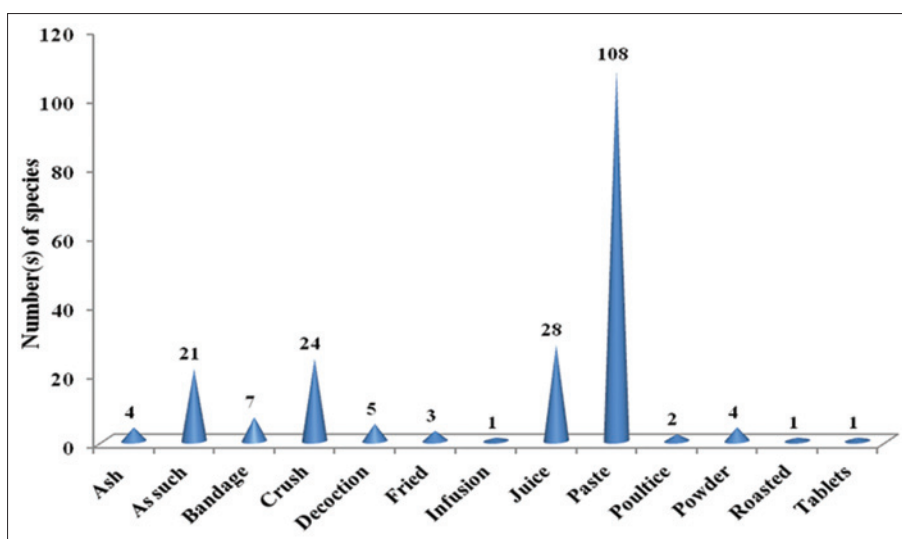


Figure 4: Various remedial preparations

and requires attention. Most of the plants were wild and herbs, so their conservation is necessary for utilization of generations to come. This can be done by encouraging local people for the cultivation of these plants. Furthermore, this preliminary study may act as a baseline for the discovery of new plant-based medicines. These plant species can be Studied in detail for different phytochemicals to understand their medicinal activity.

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