

## Inventorying Plant Genetic Resources of Religious Importance and their *In Situ* Conservation: A Case Study of Farming Communities of Kumaon Himalaya, Uttarakhand, India

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Plant genetic resources (PGR) are considered to be the integral part of human life to provide food, medicine and industrial raw materials. They also offer immense potential and untapped benefits for future generations. The pattern of resource utilization link human beings firmly with the culture, beliefs and religion, which they have adopted socially since long past and in return knowingly or unknowingly played an important role in their conservation. In this way, the culture and religion, which are most important part of human life remain in harmony and in return, help in conservation of surrounding plant diversity for its sustainable utilization. In the present communication, an attempt has been made to study the role of folk culture, ceremonies and rituals performed by hill communities in PGR conservation. Therefore, an integration of traditional culture with modern scientific developments by adding value would help in effective conservation of plant diversity in the area of study. Information on the use of plant genetic resources for religious purposes have been collected and the role of religious ceremonies in conservation of PGR have been discussed.

### Introduction

The relationship between human beings and plants has evolved gradually from the beginning and spread of agriculture. The Indian culture born and nourished in the lap of nature has been deeply influenced by plants, trees, herbs, creatures and other resources in the vicinity. The significance of plant species in human life has been illustrated thoroughly and systematically in ancient literature such as Vedas, Upanishads, Manusmriti, Arthasashtra, etc. According to Hindu mythology, none of the festivals, fasts, rituals or religious ceremonies complete without mentioning use of plants and plant parts (Agarwal, 1970; Randhawa, 1964). Water, Earth, plants, animals, human beings and the Divine forces have come together in the images of Goddess “Prithvi” and also identified as mother Earth or ‘Devi’. The Goddess Earth sustains the plant life in its multitude and for the reason, the plants are considered sacred.

Plants are indispensable to rituals and religion and are thought to provide a devotional ambience and symbolize a connection with God and they may even take the believer into the spiritual world. The eternal presence of God and spiritual being is continuously verified by some plants representing their existence or indelibly marked by their presence (Ford, 1978). The environment, particularly the vegetation has closely been associated with

the human life and has occupied a prominent place in his traditional and cultural web (Campbell, 1915; Banerji, 1955; Pal, 1972; Chaudhary *et al.*, 1975, 1980; Agrawal, 1980; Ford, 1985; Gaur *et al.*, 1984). Many plant species are associated with the religious and ritual sentiments of the people and therefore, they are not destroyed by them. Religious and cultural activities promote the conservation of biodiversity up to a large extent (Krishnan and Ghosal, 1997).

In the present investigation, plant species used by hill communities during fast, festival, rituals and religious ceremonies in Kumaon Himalaya of Uttarakhand state were inventoried and documented. Consequently, the role of rituals, festivals, fasts and religious ceremonies in conservation of plant genetic resources (PGR) particularly *in situ* on-farm conservation was investigated. In addition, the role of PGR in socio-cultural development of local communities is also discussed.

### Materials and Methods

Data pertaining to uses of plants in various festivals and religious ceremonies were gathered from primary sources by using planned structured and unstructured questionnaire/interview scheduled at each individual household level during the year 2000-2003. Sample households were randomly selected from all 33 development blocks of five hill districts of Kumaon Himalaya of Uttarakhand. Three to four villages were

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selected from each development block representing communities inhabiting in the region. In each selected village, five per cent households were randomly selected for interview by adopting lottery system. A total of 298 respondent households were interviewed for inventorying and documenting plant species used in various religious ceremonies, fast, festivals and rituals. The district-wise details of the development blocks, total number of villages, total households, number of villages selected during survey and the number of households visited are presented in Table 1. During the survey, a non-participant observation method was also deployed while recording the data on plant species associated with religious ceremonies and rituals. These included only the species that were part of regional crop diversity or wild species occurring in the vicinity. Commonly cultivated ornamental and fruit species (coconut, arecanut, betel leaf etc.) offered to perform the rituals, though very important but by and large were not considered in the present study as these were not cultivated in this region.

Using participatory rural appraisal (PRA), information was obtained on conservation of individual plant species widely used for religious purposes. Information obtained was authenticated from knowledgeable elderly people and *Purohits* or *Brahmins* who performed the religious ceremony and rituals on behalf of *Yajmans* (people belonging to other castes). The impact of fasts, festivals, religious ceremonies and rituals on conservation of these plant species was also analyzed.

### Results and Discussion

Apart from cultivated species used for food and other purposes, many plant species growing in surroundings are also used to fulfill the day-to-day requirements. It is a well-known fact that many plants or plant parts (flowers, leaves, fruits, seeds, roots, tubers, flowering twigs etc.) are used to perform various religious rituals in different phases (from birth to death) of life. The religious literature indicates that the Hindu religion is one of the ancient religions; the mention of uses of plants and plant parts in

performing religious ceremonies is a common phenomenon. Our religious *gurus*, *rishis*, who spent a long span of their life in the forests and mountains, used to perform different rituals as a mark of respect to God. It is believed that the garland from *Cicer microphyllum* (whole plant), occurring in higher hills were worn by the '*Rishi-Maharshi*' for life longevity. The *Bhotiya* tribe in remote areas of Uttarakhand is still using bark of *Betula utilis* and *C. microphyllum* for this purpose. Similarly, *Cynodon dactylon* (*Doob*) is a common grass found almost everywhere is used in different religious rituals. Since, there is a reference to this grass in various Indian scriptures and even in the *Vedas* and according to mythology, Lord Rama used it as a substitute for food during his 14-years exile. Great poet Tulsi Das also wrote about its importance in religious rituals.

The land of Uttarakhand is globally known as '*Devbhumi*' (Land of Gods) due to its spiritualistic values. Several local deities (gods and goddesses) are worshipped in the entire hill region because of their deep faith and belief. Different plant species are offered to different deities on the occasion of worship, ceremonies and funeral rites. According to Hindu religion, 16-*Sanskars* are necessary to be performed in different phases of life. The important among these are: *Namkaran-Sanskar* (naming a new born child), *Annaprashan-Sanskar* (offering food to a new born child for the first time), *Mundan-Sanskar* (removing hair of a child for the first time), *Yagyopawit Sanskar* (wearing a religious thread), *Panigrahan-Sanskar* (marriage), *Antim-Sanskar* (funeral). Except funeral rites, Lord *Ganesh* is worshipped first of all as he has been given prime place among all gods and goddesses and supposed to check all hurdles to be faced during performing of rituals. In place of idol of Lord *Ganesh*, fresh cow-dung of calf is used for making symbol of *Ganesh* and the runner having green leaves of *C. dactylon* is placed on top of the triangle like structure. According to the nature of particular ritual, rite or ceremony, different plant species are used or some times flexible approach is also adopted due to non-availability

**Table 1. Number of development blocks, villages and households of Kumaon surveyed for recording of information on plant species of religious importance**

| District    | Development blocks | Total no. of villages | Total no. of households | No. of villages selected | No. of household surveyed |
|-------------|--------------------|-----------------------|-------------------------|--------------------------|---------------------------|
| Almora      | 11                 | 937                   | 36480                   | 33                       | 100                       |
| Bageshwar   | 3                  | 302                   | 12182                   | 9                        | 32                        |
| Champawat   | 4                  | 297                   | 11981                   | 12                       | 31                        |
| Nainital    | 7                  | 698                   | 26822                   | 21                       | 63                        |
| Pithoragarh | 8                  | 720                   | 23604                   | 24                       | 72                        |
| Total       | 33                 | 2954                  | 111069                  | 99                       | 298                       |

of related *Puja Samagri* (material for worshipping) and locally available plants or plant parts are offered in place of those plants which are not indigenous to the region. In case of marriage, young uprooted plant of *Musa balbisiana* (banana) or its leaves, twigs/ branches of *Prunus cerasoides* (*pajja/payyan*), twigs of *Pinus roxburghii* (*chir*) are commonly used for erecting *Lagan Mandap* (*Bedi*). Leaves of *Mangifera indica* (*aam*) and *Ficus religiosa* (*peepal*) are put on the top (mouth) of *Kalash*, a pot filled with water for performing ritual related to marriage. Likewise, in funeral rites, the *Pindas* from grain flour of barley (*Hordeum vulgare*) are prepared and offered in respect of recently deceased person. In this ritual, plants like *Eclipta alba*, *Asparagus adscendens*, plants bearing white coloured flowers and *Eragrostis cynosuroides* are used. Similarly, *Anaphalis contortus* (heads) and *Eragrostis cynosuroides* (leaves and stems) are used on occasion of *Shradh Paksh* in each annual rites of dead person. Species like *Stephania glabra* (tuber), *Asparagus adscendens* (twig), *Cousinia thomsoni*, *Verbascum thapsus* (whole plant), *Orchis latifolia* (roots), *Zanthoxylum armatum* (stem) etc. are used to get rid off evil spirits.

There are also similar examples to be cited with regard to local festivals celebrated by the people in which the indigenous plants are used. In the month of *Chaitra* according to Hindi calendar (April-March), the children celebrate a local festival locally known as “*Ghhoga Mata*” or “*Phooldehi*” during first eight days of the month. Basically, this is the welcome of spring season when a number of plants flower in the nature. For prosperity and happiness, the children collect flowers of *Reinwardtia indica* (*phyunli*) in a basket made up of bamboo along with the flowers of *Rhododendron arboreum* (*burans*), *Pyrus pashia* (*mol-mundi*), *Valeriana jatamansi* (*sumaya*), *Tulipa stellata* (*ghongla*) and *Buddleja paniculata* (*khanki*) from surroundings in the evening. On next day morning, all the flowers are first offered to God in village temple and then put at the doorstep of every household and local song is chanted to make the act musical with full of cultural feelings:

*Jai Ghhoga mata Phyunli ka phool*  
*Jai Ghhoga mata Mol-mundi ka phool*  
*Jai Ghhoga mata Burans ka phool*  
*Jai Ghhoga mata Khankia phool*

A total of 81 plants species used in 83 rituals and ceremonies in Uttarakhand region of Kumaon Himalaya are given in Table 2. These belong to 37 families of higher

plants and are considered as sacred plants by the local inhabitants. The flowers, leaves, flowering twigs, fruits, etc. of a number of plant species offered to local deities as per the nature of ritual to be performed are given in Table 3. In Uttarakhand, the flowers, leaves, bark, roots etc. of a variety of species like *Delphinium denudatum*, *Origanum vulgare*, *Betula utilis*, *Myrica esculenta*, *P. cerasoides*, *Saussurea obvallata*, *Nardostachys jatamansi*, *V. jatamansi*, *Salix wallichiana*, etc. are used only on some special occasion by the inhabitants residing in upper reaches of Kumaon Himalaya. The seeds, fruits, leaves, stems (woods) etc. of about 15 plant species are offered in worship of local deities, gods and goddesses. Different dried plant parts (leaves, flowers and roots) of some of the species like *Skimmia laureola*, *Artemisia japonica*, *Cupressus torulosa*, *Juniperus communis* (leaves), *Achillea mellifolium*, *Chrysanthemum nubigenum*, *Nardostachys jatamansi*, *V. jatamansi*, *Tancetum longifolium*, *Jurinea dolomieae*, *Selinum tenuifolium* (roots) are burnt for incense during religious ceremonies. Most of such plant species contain essential oils and due to burning they emit a fragrance and help in purification (*shuddhi*) of the air all around. Generally, dried plant parts of several of these species are burnt mixing with butter or *ghee* (animal fat).

Plants have been used in body sacrament (*Sarir-sanskar*) rites since ancient time. Goddess Parvati used to collect the *Kush* (*Eragrostis cynosuroides*) for worship (*puja*); she also adorned herself with the (*doob* grass) *C. dactylon* during her wedding (Karmakar, 1951). In present investigation, 15 plant species were observed being used in various types of ceremonies (8 species in marriage, 5 in *Yagyopawit Sanskar* and two in funeral rites). In the Uttarakhand hills, there is a tradition of worshipping local deities with offering porridge prepared from newly harvested grains like *Amaranthus paniculatus*, *Fagopyrum esculentum* and *Triticum aestivum*. Local festivals are supposed to be the happiest occasions of enjoyment and celebrated with great gaiety and enthusiasm. Plants as a whole and seeds/grains of cultivated crops are used for different purposes in local festivals. Eight plant species are found useful for this purpose. Apart from the above, trees are worshipped, as it is believed that gods and goddesses live in the species like *F. religiosa*, *F. benghalensis* (*bargad*) and *Emblia officinalis* (*aonla*). *Peepal* is considered symbol of Lord Krishna and depicts true love and longevity of life of husband, mango is offered to Lord Shiva and *aonla*

**Table 2. Plant species used for religious ceremonies and rituals in Uttarakhand Himalayas**

| S.No. | Botanical name  | Vernacular        | Family        | Habit, habitat and distribution                                 | Local use in rituals   |
|-------|---|-------------------|---------------|---|--|
| 1     | <i>Abies pindrow</i> Royle  | Raga              | Pinaceae      | Tree, sub-alpine zone, 3000-3500 m                              | To ward-off evil spirits   |
| 2     | <i>Achillea millefolium</i> L.  | Gandrayan         | Asteraceae    | Herb, sub-alpine zone, 3000-3500 m                              | Roots are burnt for incense  |
| 3     | <i>Aegle marmelos</i> (L.) Correa* <sup>@</sup>   | Bael              | Rutaceae      | Tree, sub-tropical zone, up to 1000 m                           | Leaves are offered to Lord Shiva   |
| 4     | <i>Amaranthus paniculatus</i> L.*   | Chaulai, chuwa    | Amaranthaceae | Herb, tropical to temperate zone, up to 3000 m                  | Porridge is offered to local deities. Breads are offered to Lord Shiva on occasion of <i>Shivratri</i> |
| 5     | <i>Anaphalis contorta</i> (D. Don) Hook.f.  | Bugula            | Asteraceae    | Herb, temperate Himalaya, 1200-1800 m                           | Flowers referred as God and Goddesses. Flowering twigs used in funeral rites                           |
| 6     | <i>Anemone vitifolia</i> Buch-Ham. ex DC.   | Khagsya           | Ranunculaceae | Herb, temperate Himalaya, 1500-2200 m                           | Flowers considered as sacred and offered to local deities  |
| 7     | <i>Artemisia japonica</i> Thunb.  | Kunajor           | Asteraceae    | Herb, temperate Himalaya, 1800-2500 m                           | Leaves used as burning incense for worship   |
| 8     | <i>A. nilagirica</i> (Cl.) Pamp.  | Pati              | Asteraceae    | Herb, temperate Himalaya, 1000-1500 m                           | Twigs are offered to soul of dead person during funeral  |
| 9     | <i>Asparagus filicinus</i> Buch.-Ham. ex D. Don   | Kairua            | Liliaceae     | Scandent shrub, temperate zone, 2000-2800 m                     | Flowers and twigs are offered to local deities   |
| 10    | <i>Avena sativa</i> L.*   | Jai               | Poaceae       | Cultivated up to 2500 m   | Seeds used in <i>Harela</i> festival with other four plant species.                                    |
| 11    | <i>Bauhinia vahlii</i> Wt. & Arn.   | Malu              | Fabaceae      | Tree, sub-tropical and sub-temperate zone, up to 1500 m         | Leaves are used in body sacrament ceremony ( <i>Yagyopawit-Sanskar</i> )                               |
| 12    | <i>Bergenia ciliata</i> Royle 1200-2000m  | Silphara          | Saxifragaceae | Herb, Temperate Himalaya,                                       | Flowers and twigs offered to local deities   |
| 13    | <i>Betula utilis</i> D. Don   | Bhojpatra         | Betulaceae    | Tree, Alpine zone 2800-4000 m                                   | Garland of bark worn by Bhotias for life longevity   |
| 14    | <i>Brassica juncea</i> (L.) Czern. & Coss. var. <i>yellow sarson</i> *                                  | Pili sarson       | Brassicaceae  | Herb, tropical and temperate zone, up to 1600 m                 | Seeds used in worship and marriage ceremonies  |
| 15    | <i>Buddleja paniculata</i> Wall.  | Phurpatia, khanla | Buddlejaceae  | Under-shrub, temperate zone, 1200-1800 m                        | Flowers considered as sacred and offered to local deities  |
| 16    | <i>Butea monosperma</i> (Lam.) Taub   | Dhank             | Fabaceae      | Tree, tropical zone, up to 600 m                                | Leaves are used as body sacrament ceremony ( <i>Yagyopawit-Sanskar</i> )                               |
| 17    | <i>Caltha palustris</i> L.  | Maniyar           | Ranunculaceae | Herb, alpine Himalaya, 3000-3500 m                              | Flowers considered as sacred and offered to local deities  |
| 18    | <i>Cannabis sativa</i> L.*  | Bharg             | Cannabinaceae | Shrub, sub-tropical and temperate zones, 350-2600 m             | Leaves are offered for Lord Shiva's worship  |
| 19    | <i>Cedrus deodara</i> (Roxb.) Loud.   | Deodar            | Pinaceae      | Tree, temperate Himalaya, 1800-3000 m                           | To scare devil spirit and branches are used to erect the wedding <i>Mandap (Bedi)</i> .                |
| 20    | <i>Chrysanthemum nubigenum</i> (DC.) Hand-Maz.  | Dhoop             | Asteraceae    | Herb, alpine Himalaya, 3000-3500 m                              | Roots used as burning incense  |
| 21    | <i>Cicer microphyllum</i> Benth.  | Chukton, Vantoor  | Fabaceae      | Herb, alpine Himalaya, 3000-4000 m                              | Dried stems are made as garland and worn by Bhotias for life longevity                                 |
| 22    | <i>Citrus aurantifolia</i> (Christm.) Sw., <i>C. reticulata</i> Osbeck* Blanco, <i>C. sinensis</i> (L.) | Narangi           | Rutaceae      | Tree/fange shrub, sub-tropical-temperate zone 800-1800 m        | Fruits used in the naming ceremony of new born child   |
| 23    | <i>Corydalis govaniana</i> Wall.  | Balsam jad        | Papaveraceae  | Herb, alpine Himalaya, 3000-3200 m                              | Roots used as burning incense  |
| 24    | <i>Cousinia thomsoni</i> Cl.  | Kanai             | Asteraceae    | Herb, alpine Himalaya, 3200-3500 m                              | Plant is hung over the houses to get rid of evil spirits   |
| 25    | <i>Cupressus torulosa</i> D. Don  | Surai             | Pinaceae      | Small tree, sub-tropical zone up to 1000 m                      | Leaves are used as burning incense during worship  |
| 26    | <i>Curcuma domestica</i> Valet. *   | Haldi             | Zingiberaceae | Cultivated, sub-tropical and sub-temperate Himalaya, 600-1500 m | Rhizomes are used in wedding ceremony or any auspicious occasion                                       |

Contd.

| S.No. | Botanical name                                | Vernacular    | Family        | Habit, habitat and distribution                          | Local use in rituals   |
|-------|---|---------------|---------------|--|--|
| 27    | <i>Cynodon dactylon</i> (L.) Pers.            | Doob          | Poaceae       | Herb, sub-tropical and sub-temperate zones, up to 1500 m | Green runners are offered to Lord Ganesha in each type of worship  |
| 28    | <i>Datura alba</i> Nees.                      | Dhatura       | Solanaceae    | Herb, sub-tropical zone, up to 1400 m                    | Flowers, fruits and leaves offered to Lord Shiva mainly on occasion of <i>Shivratri</i>  |
| 29    | <i>Delphinium denudatum</i> Wall. ex Hook. f. | Nirvishi      | Ranunculaceae | Herb, alpine Himalaya, 3000-3200 m                       | Flowers and twigs are considered as sacred and offered to local deities  |
| 30    | <i>Eclipta alba</i> Hassk.                    | Bhringraj     | Asteraceae    | Herb, throughout India up to 1300 m                      | Plant is considered as auspicious. Offered in <i>Shradh</i> for paying respect to a recently deceased person   |
| 31    | <i>Emblica officinalis</i> Gaertn.*           | Aonla         | Euphorbiaceae | Tree, tropical zone, up to 1200 m                        | Leaves and twigs are offered to Lord Shiva   |
| 32    | <i>Eragrostis cynosuroides</i> Beauv.         | Kush          | Poaceae       | Herb, sub-temperate zone, 1000-1400 m                    | Leaves are used for making Brahma idol and in wedding ceremonies and funeral rites   |
| 33    | <i>Fagopyrum esculentum</i> Moench.*          | Phapar, ogal  | Polygonaceae  | Herb, temperate and sub-alpine Himalaya, 1800-3200 m     | Porridge offered to local deities  |
| 34    | <i>Ficus benghalensis</i> L.@                 | Bad/Bargad    | Moraceae      | Tree, sub-tropical zone up to 1200 m                     | Tree considered as sacred and worshipped. Leaves are used as a body sacrament ( <i>Yagyopawit-Sanskar</i> )  |
| 35    | <i>F. religiosa</i> L.                        | Peepal        | Moraceae      | Tree, sub-tropical and temperate zone up to 1400 m       | Tree considered as sacred and worshipped. Leaves are used in making of <i>Kalash</i> . Dried branches are burnt in <i>Homa</i>   |
| 36    | <i>F. roxburghii</i> Wall.                    | Timula        | Moraceae      | Tree, sub-tropical and sub-temperate zones, 650-1500 m   | Leaves are used in worship and wedding ceremonies and also used to prepare small bowls for putting <i>Puja-samagri</i>   |
| 37    | <i>Grewia optiva</i> J.R. Drumm.ex Burret@    | Bhimal        | Tiliaceae     | Small tree, sub-temperate zone, 1000-1500 m              | Leaves are used in the worship of local deities  |
| 38    | <i>Hordeum vulgare</i> L.*                    | Jau           | Poaceae       | Herb, temperate Himalaya, 1200-3200 m                    | Grains are burnt in <i>Homa</i> in worship of gods and goddesses in the end of <i>Puja</i> so that its fume reaches to every corner of the house and brings prosperity and happiness |
| 39    | <i>Hypericum uralum</i> Buch.-Ham. ex D. Don  | Chaya         | Hypericaceae  | Herb, temperate Himalaya, 1200-2000 m                    | Flowers and twigs considered as sacred and offered to local deities  |
| 40    | <i>Juniperus communis</i> L.                  | Jhora         | Cupressaceae  | Small tree, Alpine Himalaya, 3000-3500 m                 | Leaves are used as burning incense   |
| 41    | <i>Jurinea dolomiaea</i> Boiss.               | Lakkad dhoop  | Asteraceae    | Herb, alpine Himalaya, 3000-3500 m                       | Roots are used as burning incense  |
| 42    | <i>Lingularia amplexicaulis</i> DC.           | Kalankee      | Asteraceae    | Herb, temperate Himalaya, 2200-2800 m                    | Flowers and twigs are considered as sacred and offered to local deities  |
| 43    | <i>Macrotyloma uniflorum</i> Roxb.            | Gahat, kulthi | Fabaceae      | Cultivated, sub-temperate zone 1000-1800 m               | Grains are cooked at the time of <i>Harela</i> to celebrate the local festivals  |
| 44    | <i>Mangifera indica</i> L.*                   | Aam           | Anacardiaceae | Tree, tropical zone up to 1000 m                         | Leaves are tied and use in the entrance during auspicious occasions, used to make <i>Kalasha</i> in <i>Puja</i> and garland for doors. Dried branches/ wood is burnt in <i>Homa</i>  |

Contd.

| S.No. | Botanical name                                 | Vernacular       | Family        | Habit, habitat and distribution                              | Local use in rituals  |
|-------|--|------------------|---------------|--|---|
| 45    | <i>Mentha longifolia</i> L.                    | Pudina           | Lamiaceae     | Herb, temperate Himalaya, 1600-2800 m                        | Garland offered to Lord Vishnu at Badrinath temple  |
| 46    | <i>Musa balbisiana</i> Colla*                  | Kela, kadli phal | Musaceae      | Tall herb, tropical zone up to 1400 m                        | Tree and leaves are used in Satya Narayana worship and also used for making of wedding <i>Mandap</i>  |
| 47    | <i>Myrica esculenta</i> Buch.-Ham. ex D. Don @ | Kaphal           | Myricaceae    | Tree, temperate Himalaya, 1500-2000 m                        | Twigs are used in preparation of wedding <i>Mandap</i> , considered as sacred and religious tree  |
| 48    | <i>Nardostachys jatamansi</i> DC.              | Masi             | Valerianaceae | Herb, alpine Himalaya 3200-4000 m                            | Roots are used for making of burning incense  |
| 49    | <i>Ocimum basilicum</i> L.*                    | Tulsi            | Lamiaceae     | Herb, sub-tropical Himalaya, up to 1400 m                    | Treated as sacred herb and worshipped in every house hold   |
| 50    | <i>Orchis latifolia</i> L.                     | Hathajari        | Orchidaceae   | Herb, alpine Himalaya, 3200-3500 m                           | Roots are used to get rid off evil spirit   |
| 51    | <i>Origanum vulgare</i> L.                     | Van-tulsi        | Lamiaceae     | Herb, temperate and alpine Himalaya, 1600-3500 m             | Plant is considered as sacred and offered to local deities in particular. Garland of plant is offered to Badrinath  |
| 52    | <i>Oryza sativa</i> L.*                        | Dhan             | Poaceae       | Herb, tropical-temperate zone up to 1800 m                   | A particular variety ' <i>sanwadhan</i> ' is used in Devi Parvati's worship. <i>Chiwda</i> (parboiled rice) of lal dhan used in <i>bhaiduj teeka</i>  |
| 53    | <i>Paeonia emodi</i> Wall. ex Royle            | Chandra          | Peonaceae     | Herb, temperate Himalaya, 2000-2800 m                        | Flowers treated as sacred and offered to local deities  |
| 54    | <i>Pinus raxburghii</i> Sarg.                  | Chir/saal        | Pinaceae      | Tree, sub-temperate Himalaya, 1200-1600 m                    | Twigs are offered to Goddess Parvati and branches are used to make wedding <i>mandap</i>  |
| 55    | <i>Pleurospermum densiflorum</i> (Lindl.) Cl.  | Tagar            | Apiaceae      | Herb, temperate and alpine Himalaya, 2500-3200 m             | Leaves and flowers are used as burning incense  |
| 56    | <i>Potentilla fulgens</i> Wall. ex Hook.       | Bajradanti       | Rosaceae      | Herb, temperate Himalaya, 1400-2000 m                        | Flowers offered to local deities  |
| 57    | <i>Primula denticulata</i> Sm.                 | Jalkutra         | Primulaceae   | Herb, alpine Himalaya, 2800-3500 m                           | Flowers offered to local deities  |
| 58    | <i>Prunus cerasoides</i> D. Don                | Panya            | Rosaceae      | Small tree, temperate Himalaya, 1400-1800 m                  | Branches and leaves are used for body sacrament ceremony, making of wedding <i>mandap</i> and burning incense. A local worship ' <i>Samyo pooja</i> ' is also performed with the branches of this sacred tree |
| 59    | <i>Psidium guajava</i> L.*                     | Amarood          | Myrtaceae     | Tree, sub-tropical zone up to 1000 m                         | Fruit used in the worship of local deities in parts of Pithoragarh district   |
| 60    | <i>Punica granatum</i> L. @*                   | Darim            | Punicaceae    | Small tree, sub-tropical and temperate Himalaya, 1000-1600 m | Fruits are used in a local festival ' <i>Herela</i> ' and twigs are used for making of wedding ' <i>Kalash</i> '  |
| 61    | <i>Pyrus pashia</i> Buch.-Ham. ex D. Don @     | Mehal, Molmundi  | Rosaceae      | Small tree, sub-temperate Himalaya, 1200-1800 m              | Twigs with fruits are used in a local festival ' <i>Ghee-Sankaranti</i> '   |
| 62    | <i>Reinwardtia indica</i> Dumort.              | Phenuli, piunli  | Linaceae      | Herb, temperate Himalaya, 1200-2500 m                        | Flowers treated as sacred and offered to local deities  |
| 63    | <i>Rhododendrun arboreum</i> Sm.               | Buransh          | Ericaceae     | Small tree, temperate Himalaya, 1500-2500 m                  | Beautiful Flowers treated as sacred and offered to local deities and used in a local flower festival ' <i>Phooldehi</i> '   |
| 64    | <i>Rosa brunonii</i> Lindl.                    | Kunja            | Rosaceae      | Shrub, temperate Himalaya, 1200-1800 m                       | Flowers offered to local deities  |

Contd.

| S.No. | Botanical name                              | Vernacular                         | Family         | Habit, habitat and distribution                       | Local use in rituals  |
|-------|---|------------------------------------|----------------|---|---|
| 65    | <i>Saccharum officinarum</i> L.             | Sugarcane;<br>Ganna                | Poaceae        | Herb, sub-tropical zone, 700-1200 m                   | Whole stem with leaves are used to worship Lord Satya Narayana and making of wedding <i>Mandap</i>  |
| 66    | <i>Salix wallichiana</i> Anders.            | Bhains                             | Salicaceae     | Small tree, temperate Himalaya, 1800-2800 m           | Treated as sacred herb and offered to local deities   |
| 67    | <i>Saussurea obvallata</i> (DC.) Edgew.     | Brahma kamal                       | Asteraceae     | Herb, alpine Himalaya, 3500-4500 m                    | Sacred flowers offered to Lord Vishnu in Badrinath  |
| 68    | <i>Selinum tenuifolium</i> Wall. ex DC.     | Bhootkeshi                         | Apiaceae       | Herb, alpine Himalaya, 3000-3500 m                    | Rots are burnt as incense. Flowers offered to local deities   |
| 69    | <i>Sesamum indicum</i> L.*                  | Til<br>(black seeded type)         | Pedaliaceae    | Herb, sub-tropical zone, 1000-1500 m                  | Seeds are used in <i>Homa</i> and wedding ceremonies  |
| 70    | <i>Skimmia arborescens</i> Ander. ex Gamble | Kedarphali, nihar                  | Rutaceae       | Shrub, temperate and sub-alpine Himalaya, 2800-3200 m | Leaves are used as burning incense  |
| 71    | <i>Stephania glabra</i> (Roxb.) Miers       | Gindaru                            | Menispermaceae | Herb, sub-tropical zone, up to 1400 m                 | Tubers are used in <i>tantrik puja</i> , psycho-medicine  |
| 72    | <i>Strobilanthes wallichii</i> Nees         | Kangdali                           | Acanthaceae    | Herb, temperate Himalaya, 2000-2800 m                 | Used in a local Bhotia festival ' <i>Kangdali</i> '   |
| 73    | <i>Tanacetum longifolium</i> Wall. ex DC.   | Dhoop                              | Asteraceae     | Herb, alpine Himalaya, 3000-3500 m                    | Whole plant is used as burning incense  |
| 74    | <i>Triticum aestivum</i> L.*                | Gehun                              | Poaceae        | Herb, growing up to 1800 m                            | Porridge made of newly harvested grains is offered to local deities and seeds are also used in a local festival ' <i>Harela</i> '   |
| 75    | <i>Tulipa stellata</i> Hook.                | Ghongla                            | Liliaceae      | Herb, sub-temperate Himalaya, 1000-1500 m             | White flowers are offered to devi to celebrate the ' <i>Phooldehi</i> ' festival  |
| 76    | <i>Valeriana jatamansi</i> Jones            | Indian valeriana;<br>Sumaya, samer | Valerianaceae  | Herb, temperate Himalaya, 1400-2800 m                 | Roots are used as burning incense   |
| 77    | <i>Verbascum thapsus</i> L.                 | Iklavir                            | Verbenaceae    | Herb, temperate Himalaya, 1400-3000 m                 | Whole plant is used to get rid of evil spirit   |
| 78    | <i>Vigna mungo</i> (L.) Hepper*             | Mash, urd                          | Fabaceae       | Cultivated up to 1800 m                               | Seeds mixed with rice are offered to devil spirit to get rid of and seeds are also used in a local festival ' <i>Harela</i> '. Sticks are kept in temples as well as home to scare devil sprits |
| 79    | <i>Zanthoxylum armatum</i> DC.              | Timur                              | Rutaceae       | Shrub, temperate Himalaya, 1000-1800 m                | Sticks are kept in temples as well as homes to scare devil spirits  |
| 80    | <i>Zea mays</i> L.*                         | Makka                              | Poaceae        | Herb, up to 1800 m                                    | Seeds are mixed with four other crop seeds and used to grow in a local festival <i>Harela</i>   |
| 81    | <i>Zingiber officinale</i> Rosc.*           | Adarak                             | Zingiberaceae  | Herb, up to 1500 m                                    | Whole plant is used to offer to local deities   |

\*: Cultivated; @ semi-domesticated

generates the sentiments of belief in women for gods. In some cases, the local men having knowledge about *Tantra-Mantra* also use plants to scare the devil souls. It is just a matter of belief, there is no scientific reason behind it, but it has the social recognition in the region (Shah and Joshi, 1971).

Plants including other biological resources play a key role in the development of culture and traditions among the society. The uses of plant and plant parts are very

common as compared to other commodities across the country in religious ceremonies and rituals. The religious importance of several plants species such as *peepal*, *gular*, *bargad*, mango, *bael*, *aonla*, *tulsi*, banana etc. has been mentioned in Puranas, Vedas, Upanishads and many other manuscripts (Heerak, 1994). In Kumarasambhava, Kalidasa described many plant species, which are useful in rituals and religious ceremonies in the Himalayan region particularly in the Uttarakhand hills (Pant, 2002).

**Table 3. Categories and number of species used in different religious ceremonies and rituals in Kumaon hills**

| Uses of plant species  | No. of plant species |
|--|----------------------|
| Flowers, twigs, leaves and fruits offered to local deities                   | 18                   |
| Plants/ plant parts used in the worship of gods, goddesses and local deities | 15                   |
| Used as burning incense in the worship or other rituals                      | 16                   |
| Used in marriage ceremonies and body sacraments                              | 13                   |
| Used in local festivals  | 8                    |
| Trees worshipped as gods   | 4                    |
| Garland offered to local deities   | 3                    |
| To prepare porridge (from newly harvested grains) offered to local deities   | 3                    |
| To scare devil spirits   | 6                    |
| Offered to dead bodies during funeral rite                                   | 2                    |

Plants with fragrant breeze and useful in rituals are also adorned the Shiva's meditation ground, Vashishtha ashram and Kanwa's ashram (Karmakar, 1951; Dixit, 1953; Tripathi, 1991). In this way, conservation of plant diversity evolved in the human society.

The seeds of yellow sarson, barley and sesame are commonly used in worship performed on wedding ceremonies and *Janam-din* (birthday) celebration. For welcoming the *Baraat*s (people accompanying bridegroom), 2-3 twigs of *Punica granatum* are kept in to the water filled copper tumbler to show the gratitude for coming. It is believed that the Goddess *Parvati* nurtured *Cedrus deodara* tree as her son and Lord *Shiva* deployed a watchman to protect it. Pine (*Pinus roxburghii*) twigs are also offered to *Parvati* as a mark of respect (Karmakar, 1951; Shastri, 1975). For the worship of a local deity 'Samyo' in the Kumaon region of Uttarakhand, the branches of *Prunus cerasoides* are essentially required as an important component of the act. A particular variety of paddy 'Sanwadhan' grown in Uttarakhand is offered to Goddess *Parvati* and because of this very cause, the local farming communities grow the variety frequently. It is a strong belief that if a variety is under cultivation, its cultivation should never be stopped in the future. Owing to such belief among the people of the region, this variety has been conserved *in situ*/on farm.

Religious ceremonies, rituals, local fasts, festivals, worship of local deities etc. have played an ideal role in the conservation of plant genetic resources (PGR) occurring in the Uttarakhand region. The cultural traditions are transferred verbally from one generation to other. There are some festivals celebrated on the basis of

cropping seasons. For celebrating the crop-based festival in the Uttarakhand hills, rice, wheat, barley, maize, blackgram, horsegram, *mehal* (*P. pashia*) and *darim* (*P. granatum*) are essentially required for offering to deities and preparation of different dishes. Many plant species are considered auspicious if grown around the human dwellings.

To overcome the evil effects of architectural error (*Vaastu clash*), many plants/trees are grown around different directions of the house (Joshi, 2007). Today there are some crop landraces in barley, yellow sarson, sesame (black seeded) and a variety of paddy (*Sanwadhan*) etc. that are of less importance as food crops in this region but have great religious value. Local communities still grow these crops on a small piece of land because of their importance in the rituals. Without the availability of these seed materials, some religious ceremonies cannot be performed. The followers of Hindu religion in this region consider that the seeds of these crops should be conserved for future. Wheat, amaranth and some local crops are grown essentially because the porridge of newly harvested grains are offered to local deities after every harvesting season in the higher parts of Himalayan region. The wood from *peepal*, *bargad* and mango is considered very good for quality furniture and other household items, but local people worship them as god and goddesses hence they protect them.

Similarly, selective use of those plants/parts (twigs, flowers, leaves, seeds, woods, roots etc.), which are important components of various Hindu ceremonies and rituals help to a large extent in protection of the species from exploitation. The plant species used in various rituals, local communities prefer to plant them around their houses/villages because of their routine requirement in the households. These plant species are collected from their natural stand in the forest and sustainably utilized from generation to generation.

The plant species associated with the religious ceremonies and rituals belonging to category of food crops, wild relatives, fruits and wild edibles, medicinal and aromatic plants are mainly trees, shrubs, herbs, grasses, climbers etc. (Table 4). Due to their religious importance, these are being conserved in the Uttarakhand region as cultural heritage of the local communities. There are examples when selected crop landraces have been conserved because of their value in performing the local rituals in the Philippines (Barnett, 1969). The present study highlights the role of folk religion, culture and

**Table 4. Categories of plant species used in various religious ceremonies in Uttarakhand Himalayas**

| Categories of plant species   | No. of species |
|---|----------------|
| Food crops and wild relatives   | 15             |
| Fruits and wild edibles   | 16             |
| Medicinal and aromatic plants   | 31             |
| Other miscellaneous plant species<br>(trees, shrubs, herbs, grasses etc.) | 19             |
| Total   | 81             |

tradition in the conservation of several such species in Uttarakhand Himalaya. Nature mother has provided platform to human beings for cultural development by growing plants and using them. Thus, the plants are considered as integral part of human culture and obviously without the association of plants, no culture can survive for long. There are many local folk songs in the region, which emphasize the sense of conservation of plant species along with creating balance in surrounding environment. A couple of them are mentioned here:

*Ni kato, ni kato, hariya jungla,  
Nana dai mein jhan maria chot,  
Jas hamar nan tina vaisa jungla vot;*

*Uncha daanaa rouchha saima, bhali tumari baani  
Tyar dali ko doodh pichha, baanaj vot ko paani  
Yo madua ka bala, gharagud ka tala*

The essence of these folk songs is to consider tree/plant as one's child who is, to be carefully nurtured and protected and conveys a message regarding living in harmony with the environment and nature has also been floated. Through suitable conservation measures, a sustainable relationship between mankind and environment particularly in the above mentioned species can be achieved.

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