ETHNOBOTANICAL STUDIES ON PLANTS OF DISTRICT HUNZA-NAGAR (GILGIT-BALTISTAN), PAKISTAN

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ABSTRACT

Ethnobotanical studies were conducted in the Hunza-Nagar district of Gilgit-Baltistan (Northern Pakistan) about the uses of plants by the local people. Information was gathered by interviewing people in different villages. People used different plant species for various purposes; however the most common uses were for medicinal purposes. The present work documents ethnobotanical information for 106 plant species including both wild and cultivated ones, belonging to 92 genera and 46 families. Habit-wise, 27 were trees, 13 shrubs, and 63 were herbs. The common names are provided for the first time in the locally spoken language "Burushiski". A common name is the key to the treasure of ethnobotanical information; as this is the name by which the local people recognize the plant species concerned. Ethnobotanical knowledge was noticed to be fading away with the modernization of society. There is an urgent need to document all the information which is available at present.

Key-words: Medicinal plants, Hunza-Nagar, Gilgit-Baltistan, Pakistan.

INTRODUCTION

The historical background of Hunza and Nagar is spread over many centuries. From that time to date the utilization of plants is part of the tradition; the people of the area use herbs for different purposes such as food, fodder, detergents, medicine and for making traditional objects. About 6000 flowering plants have been reported to occur in Pakistan very large number of plants are found in northern parts of Pakistan; 10% of all these plants are known to be used for various medicinal purposes (Shinwari *et al.* 2002). The northern part of Pakistan is an integral part of Central Asian Centre of Diversity (Vavilov 1950). It is now widely accepted that anthropogenic disturbances would result in the extinction of up to 20 % of the world's species over the next 30 years (Arroyo *et al.* 1992). Ethnobotany is the discipline concerned with relationships between people and plants; not just the medicinal plants but about all the ways that people perceive, value, and use plants – whether as food, fuel wood, fodder, and so on (Hamilton 2002). However, the major interest of ethnobotanical studies is usually focused on medicinal plants. This millennium has come to recognize folk medicine as being of general use and general respectable in face of a continuous rise in disease (Saeed 2002).

The Ethnobotanical studies have become increasingly valuable in the development of health care and conservation program in the different parts of the world (Black 1996). The green pharmaceutical are receiving extraordinary importance and popularity. Most importantly the trend of using traditional medicines is increasing again (Anonymous, 2008). In recent years several ethnobotanical works have been reported from different parts of Pakistan (Gilani *et al.* 2001; Shinwari and Gilani 2003; Shah *et al.*, 2006; Qureshi *et al.*, 2006; Khan and Khatoon, 2007; 2008; Qureshi *et al.*, 2010; 1011; Raouf *et al.*, 2012; Fahad and Bano, 2012). However, much work has not been done on the plants of Hunza-Nagar district. Khan *et al.* (2011) reported only medicinal uses of 43 plant species from Khunjrab National Park; but most of the other parts of Hunza-Nagar are unexplored.

MATERIALS AND METHODS

The study area was visited several times for the collection of plant specimen during 2004-2009. The collected plant specimens were identified with the help of Flora of Pakistan and some other relevant Floras. During the survey people were interviewed for the traditional uses of the plants with emphasis on medicinal uses of the plants, and the collected information was documented. The information was compared with available ethnobotanical literature of Pakistan.

RESULTS

Ethnobotanical information was obtained for 106 plant species (4 Gymnospermic, 93 Dicotyledons and 9 Monocotyledons) belonging to 92 genera of which 8 were Monocotyledons, 82 Dicotyledonss and 4 Gymnospermic.

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These belonged to 46 plant families among which 3 were Monocotyledons, 3 Gymnospermic and 40 Angiospermic. The documented information contains cultivated species as well. The present study shows that the people of the area depend on the plants to fulfill their daily life needs to a great extent. Among the medicinal uses the plant species are mostly used as tonic and for the treatment of stomach pain, stomach disorders, itching, bleeding, blood pressure, fever, asthma, and chest congestion. The details of the species are given in the Table 1.

Serial ٠ 100 9 0 14 Ŧ 10 12 Alliaceae Chenopodiacea Betulaceae Berberidaceae Anacardiaceae Alliaceae Family name Capparidaceae Cannabaceae Brassicaceae Brassicaceae Campanulaceae Chenopodiacea Species name Chenopodium album Salsola collina Pall. Pistacia integerrinta (cultivated) Betula utilis D.Don, Berberis chitria Lindl (cultivated) Allium cepa L. (cultivated) Cannabis sativa L. (cultivated) Brassica oleracea L. Brassica napus Allium Capparis spinosa L. (cultivated) Schrenk) C.B. Codonopsis clematidea cultivated cultivated SCHEVARIA L. Clarke SHAME rapa Moloo Kaavo Chary Gobi Kayam Taa Ghashue Common Laghashin Gahgon Ya sheka Eshkeer Part used Seed Leaves Tap root Tap root Flesh Fruit and Whole Plant Whole plant inflorescenc Whole plant branches Stem & blood pressure, stomach disorders and paralysis mixed with water as a result a milky water is prepared and used The tap root of this plant is used for tonic which increases the male and salad. The dry plant use as fodder for cattle to increase the milk The whole plant is used for the stomach disorders and as vegetable The tap roots of this plant are used as vegetable and salad. It is also cooked dishes it is also used in salad, "chutney" and as tonic. this plant is as salad. This plant is used as vegetable in different dishes. The major use of household utensils, plough, etc while outer bark of stem is used the broken bones It is used for the purification of blood and to speed up the healing of considered good firewood especially for winter season Wood of this tree is very hard and heavy due to which it is This is highly important medicinal plant which is specially used for from boils bulb of this plant is cooked in hot ash and used to pull out the pus the amount of milk in animals. While the mature plant body is used The immature herb is used as fodder especially for goats. The mature fruits of this plant are mixed with lassi and use to contro place of oil and ghee in cooking This is a cultivated plant The seeds of this plant are ground and good for heart patients and fodder for cattle Local people of Hunza and Nagar use this plant for making The bulb of this plant is used as vegetable in different dishes. The foliage of this herb is used for making local dishes. Also used the riching. Also used in pickle used for stomach problems The inflorescence of this plant is used Beside this it is also used as tonic for children Purposes of use in different dishes. Along the It increase His The B 5

Table 1. Ethnobotanical uses of plants of Hunza and Nagar Valleys

| 31. Cuscutaceae | 30. Cupressaceae | 29. Cucurbitaceae | 28. Cucurbitaceae | 27. Cucurbitaceae | 26. Cucurbitaceae | 25. Compositae | 24. Compositae | 23. Compositae | 22. Compositae | 21. Compositac | 20. Compositae | 19. Compositae | 18. Compositae | 17. Compositae | 16. Chenopodiacea | c Citatopouracea |
|--|--|---|---|--|---|--|--|--|---|--|--|--|--|----------------------------|---------------------------------|--|
| Сиѕсиа еторага 1 | Juniperus excelsa M.Bicb. | (cultivated) | c Citrullus lanatus (Thunb.) Mats &Nakai (cultivated) | e Cucumis melo L. (cultivated) | e Cucurbita maxima Duch. ex Lam. (cultivated) | Saussurea simpsoniana (Field & Garden) Lipschitz | Cichorium intybus L. | Carthanus tintoris L. (cultivated) | Artemisia rutifolia Spreng. | Allardia tomentosa Decne. | Taraxacum afficinale L. | Echinops cornigerus DC. | Artemisia sieversiana Ehrh. | Allardia glabra Decne. | a Chenopodium foliosum Asch. | 4 Casashaanna anda m |
| Mayon | Gall | Laye | Bover | Ghoon | Hoser | Boshi funar | Eshkanagi | Pong | Mon | Harchum | Tergut | Jachir | Khakhas | Harchum | Saro | |
| whole Plant | Fruit | Fruit | Fruit | Fruit | Fruit | Whole plant | Root | Flowers | Whole plant | Whole plant | Leaves | Whole plant | Whole plant | Flower head | Whole plant | |
| The whole plant is used for jaundice, cough, and blood purification. | The fruits of this plant are used by local people for kidney stone problems. | Indigestion. Mostly it is used by sugar patients and blood pressure patients. | The watermelon is used by heart patients to control the level thirst and people also use it as tonic. | Melon is used worldwide keenly. It is used as tonic and for stomach disorders. | The unripe fruit of this plant is used as vegetable. While the mature fruit use for making different sweet dishes and it is also used as tonic. | It is used for chest problems, asthma, and blood pressure and for losing weight. | The root of this plant is used for controlling ofton prossure- | The flowers heads of this plant boiled with milk are used for coughing and chest congestion. | This plant is used for stomach disorders and control of the blood pressure. | This plant is used with desi ghee to control the bleeding of pregnant women. | The fresh leaves of this herb are used for cooking. It is used to get relief in fever. | The fresh herb is used as fodder for animals and to increase soil fertility. While the dry herb is used as fuel. | Plant body of this herb especially leaves and stem are used for stomach pain and gastro. It is used for removing intestinal worms in children. | to stop bleeding in women. | | problems uterus and bleeding and disturbed menstruation. |

| The wood of this tree is very hard it is used for making different kinds of utensils and firewood. | Wood | Kasunder | Fraxinus hookeri Wenzig | Oleaceae | 49. |
|---|---------------------------|----------------|---|--------------|-----|
| The fruits are used as tonic and also used for cardiac troubles, abdominal problems and stem latex is used to pull out hidden spines on the body. | Fruit | Phak | Ficus carica L. (cultivated) | Moraccac | 48. |
| Dry fruits of this plant are used for cough and chest congestion and fresh fruit is used as tonic for children feeding women. | Fruit | Bernach | Morus alba L. (cultivated) | Moraceae | 47. |
| Leaves of this plant are used as vegetable in daily life; medicinally it is used for gastro, stomach disorders, constipation and as tonic. | Leaves | Shovench al | Malva verticillata L. (cultivated) | Malvaceac | 46. |
| Fruits of this plant are used as vegetable in daily life, medicinally it is used for stomach disorders, constipation and as tonic. | Fruit | Bendi | Abelmoschus esculentus (L.) Moench (cultivated) | Malvaceae | 45. |
| Lin seed of this plant is used for different purposes such as for constipation, vomiting and stomach problems. | Seed | Homan | (cultivated) | Linaceae | 44 |
| | Bulb | Geepuse | Tulipa clusiana DC. | Liliaceae | 43. |
| | Whole Plant | Tumoro | Thymus linearis Benth. | Labiatae | 42 |
| The local people use the leaves of this plant for the stomach disorders. | Leaves & stem | Pholal | Mentha royleana Benth | Labiatae | = |
| The extract of this plant is used for stomach pain vomiting and indigestion beside this the whole plant is used with salad and as a spice. | Whole Plant | Podina | Mentha arrensis L. | Labiatae | 40 |
| The whole plant is used for making local broom for cleaning the houses. | Whole plant | Phopus | Isodon rugosus (Wall ex. Benth.) Codd. | Labiatae | 39. |
| The common name of this plant is walnut. The oil of walnut lowers the cholesterol level in the blood therefore it decreases the blood pressure and bark is used as miswak (tooth-brush) for cleaning the teeth. | Fruit | Teley | Juglans nigra L. (cultivated) | Juglandaceae | 8 |
| The extract of the leaves is used for controlling the blood pressure and diabetes. | Leaves | Tagshe | Swertia tetragona (Edgew.) Clark | Gentianaceae | 37. |
| It is used for rupturing and cleaning boils, and controls the swelling of feet. | Stem | Sopat | Ephedra intermedia Schrank & Mayer | Ephedraceae | 36. |
| The fruit of this plant used for controlling blood pressure and the seed oil used as an anti cancer. | Fruit &Seed | Chashe | Hippophae rhamnoides U. | Elacagnaceae | 35 |
| Fruits of this plant are edible and medicinally it is used in the treatment of cough, chest pain, while the bark of this plant was used as tea. | Fruit & bark | Ghendaw ar | Elaeagnus angustifolia L. (cultivated) | Elacagnaceae | 4. |
| Fruit of this tree is used as tonic by all people of the area. Leaves are used as fodder and wood is used as firewood. | Fruit, leaves, wood | Fails | Elaeagmis umbellata Thunb. | Elacagnaceac | 33, |
| Persimmon is commonly eaten as a irosa iruit. Also by pregnam women and it is also use as tonic to increase aphrodistac. Along the tonic it is use to control stomach disorders. | Fruit | Hermit | Diospyras kaki 1 (cultivated) | Ebenaceae | 33 |

| Wheat grain is used worldwide as daily took, but the special and this grain is as tonic | Grains. | Gur | Triticum aestivum L. (cultivated) | Poaceae | 66. |
|--|--------------------|----------------|--|----------------|-------|
| The flour of these grains is used of blanches conditions to maintain the level of blood pressure, sugar and cholesterol. | Grains | Hari | Hordeum vulgare L. (cultivated) | Poaceae | 65. |
| This plant is the main source or winned. Leaves of this plant are wood all kinds of furniture are prepared. Leaves of this plant are used as fodder. | Wood | Buche | Platanus orientalis L. (cultivated) | Platanaceae | 2 |
| also reduce cholesterol level of blood. | seeds | Ispagol | Plantago major L. | Plantaginaceae | 63. |
| This plant is major source of timber and wood for tuel. Kosin is also obtained from this plant which is used for joking different things and different purposes. | Whole body | Kachully | Picea smithiana (Wall.) Boss. | Pinaceae | 62. |
| This tree is a major source of union and inverse. from the tree which is used for joining different things (adhesive). | Wood | Chec | Pinus wallichiana A.B.Jackson | Pinaceae | 61 |
| Used it for stomach disorders and vomiting. | Whole plant | Shekarhu ch | Trigonella foenum- oraecum L. (cultivated) | Papilionaceae | 60. |
| cough, prevention of urinary tract infection and also used as anti- | Root | Cheighes | Glycyrrhiza glabra L. | Papilionaceae | 59. |
| life for health tonic. | Legume &seed | Rabong | Lablab purpureus (L.) Sweat subsp. bengalensis (Jacq.) Verdc. (cultivated) | Papilionaceae | ,se |
| time spine, promine of this plant is been it is used as food in daily | Whole plant | Hapochus | Astragalus grahamianus Rovle ex Benth. | Papilionaceae | 57. |
| The leaves of this plant are used to increase the son, the woody plant body is used as firewood. This grain, plant is used for keeping away mice and reptile. | Leaves and stem | Pushul | Sophora mollis (Royle) Baker, subsp. mollis | Papilionaceae | 56. |
| Leaves are palatable that s will in winter. | Leaves | Kiki | Robinia pseudo-acacia L | Papilionaceae | 55, |
| The mature seeds of this plant are cooked and used for astima, cross- congestion, stomach disorder and used as tonic for women. | Seeds | Bokak | Vicia faba L. (cultivated) | Papilionaceae | 54. |
| The young plant is used as vegetable and mature plant is used as folder for cattle. | Whole plant | Shaptal | Trifolium repens L. (cultivated) | Papilionaceae | ä |
| Unripe seed of this plant are used as vegetable and powder of its seed is used in asthma and chest congestion. The unripe fruit is used as tonic. | Seed | Gherk | Pisum sativum L. (cultivated) | Papilionaceae | 52 |
| fodder for milch cattle for increasing the milk production. | Plant | Shpiting | Medicago sativa L. (cultivated) | Papilionaceae | 51. 1 |
| Seeds of this plant is used as vegetable while mature plant is used as | | Mardakhy | Papaver sonniferum 1 (cultivated) | Papaveraceae | 50, I |

| 67. | Poaceae | Zea maysn l., (cultivated) | Makye | Grains. | Grains of this plant are used for food and making pop com. It is used as tonic for cattle. |
|-----|---------------|---|----------------|---------------|--|
| 99. | Poaceae | Panicum miliaceum L. (cultivated) | Baeye | Grains | The grain of the plant is used to control of blood pressure, cholesterol and asthma. It is used as tonic for cattle. |
| 69 | Poaceae | Setaria italic (L.) P. Beauv. (cultivated) | Cha | Seed | Seed of this plant is cooked with milk and used as tonic by all people of the area. |
| 70. | Poaceae | Saccharum ravennae (L.) Murr. | Furoh | Stem | The dry stem pieces of this plant are used to make the desi (local) pen for children as well as for elders. |
| 71. | Polygonaceae | Bistorta affinis (D.Don) Green | Hare utis | Whole plant | This herb is considered as tonic for cattle, it is observed that when cattle graze this berb that day the milk production is high. |
| 72 | Polygonaceae | Rheum spiciforme Royle | Chotal | Stem | The stem of this herb is used as tonic and for thirst. Stem is also use for making local piano. |
| 73. | Polygonaceae | Fagopyrum esculentum Moench (cultivated) | Baron | Grains | Grains are used as food. The grains of this plant are used for urine problems and to reduce the cholesterol level in the blood. |
| 74. | Primulaceae | Primula macrophylla D.Don, | Lelo | Whole Plant | The flower of this plant is used for eye redness, and mature root of this plant is used in the treatment of throat infection and tonsil problems. |
| 75. | Punicaceae | Punica granatum L. (cultivated) | Bechill | Fruit | Pomegranate is a small tree. The fruit is delicious to eat. The juice of this fruit is used as tonic and bark of fruit is used against cough and bone pain. |
| 76. | Ranunculaceae | Clematis orientalis L. | Morgush | Leaves & stem | Leave and immature branches of this plant are palatable due to which it is used as tonic and fodder for cattle. |
| 77. | Ranunculaceae | Delphinium brunonianum Royle | Mokhoti | Whole Plant | It is used as an anti-dandruff, which promotes hair quality and kills the parasites if any. |
| 78. | Rosaceae | Cydonia oblonga Mill. (cultivated) | Ghaoti | Fruit | People of the area used the fruit as tonic. Wood of this tree is used as firewood. |
| 79. | Rosaceae | Malus pumila Mill. (cultivated) | Baalt | Fruit | Apple is used as tonic by all people of the area and wood of this tree is used for making different utensils. |
| 80. | Rosaceae | Prums armenica L. (cultivated) | Joo | Fruit | Fruits of this tree (Apricot) are fleshy. It is used almost in every problem concerned to the human body. But the frequent use of this fruit is in stomach problems, headache, constipution and anxiety. |
| 81. | Rosaceae | Prunus cerasifera Ehrhart. Prunus domestica L. (cultivated) | Alobukha ra | Fruit | People of the area use the fruit of these trees as tonic which increase the blood and leaves are used as fodder. |
| 82. | Rosaceae | Prums dulcis (Miller) webb. (cultivated) | Badam | Fruit | It is considered most valuable dry fruit (Almond) throughout the world. People of the area use this fruit as tonic, to increase the sharpness of mind, chest congestion and softness of skin. |
| 83. | Rosaceae | Prums aviam L. (cultivated) | Glass | Fruit | The fruit of this plant (Cherry) is very delicious so it is used throughout world for better health care. Medicinally it is used for increasing blood production. |

| 101 | 100 | 99, | 98. | 97. | 96. | 95. | 94. | 93. | 92. | 91. | 90. | 89. | 90 | 87. | 86. | 85 | 84 |
|---|--|---|---|---|--|---|---|--|---|---|--|--|--|---|--|---|---|
| Umbelliferae | Umbelliferae | Thymelaeaceae | Tamaricaceae | Solanaceae | Solanaceae | Solanaceae | Solanaceae | Simaroubaceae | Scrophulariacea e | Saxifragaceae | Salicaceae | Salicaceae | Rosaceae | Rosaceae | Rosaceae | Rosaceae | Rosaceae |
| Coriandrum sativum L. (cultivated) | Carum carvi L. | Daphne nucronata Royle | Tamarix arceuthoides Bunge | Solarum tuberosum L. (cultivated) | Datura stramonium L. | Solanum lycopersicum L. (cultivated) | Capsicum annuum L. (cultivated) | Ailanthus altissima (Mill.) Swingle (cultivated) | Verbascum thapsus L. | Bergenia stracheyi Hook.f. et Thoms | Salix capusii Franchet (cultivated) | Populus alba L. (cultivated) | Spiraea canescense D.Don | Fragaria mibicola (H.f.) Lindl. ex Lacaita | Sorbus tianschanica Rupr | Pyrus communis L. (cultivated) | (eultivated) |
| Thon | Hayave | Nirk | Hookr | Aalo | Datura | Balogan | Maruch | Lanthus | Zakun sheka | Sasper | Beake | Berpeya | Chagho | Gruzal | Dindesh | Shogri | Chukdar |
| Whole Plant | Fruit & Seed | Bark | Leaves & Stem | Tubers | Seed | Fruit | Fruit | Stem | Whole plant | Root & branches | Young | Wood | Young branches | Fruit | Leaves | Fruit | Fruit |
| The leaves and stem of this plant are used in yam (curry) and chutney while the fruit of this plant is used for indigestion, vomiting | The fruit of this herb is used in almost every kind of edible things as spice. But the special use of this herb is to control the stomach disorders in the children. | The bark of this plant is used in diseases of bones and for washing hair. | Leaves of this shrub are used to increase the soil fertility. Woody stem of this plant is used as firewood. | This plant is used globally as vegetable which is good source of starch. For the medicinal uses, the tuber is cooked in the hot ash and steam is inhalted for the treatment of sinusitis. | The leaves and flowering top of this plant is used to control salivation, muscular rigidity, and it is also used in the treatment of asthma. | Fruit extract of this plant is used for rupturing of boils. | The fruit of the plant (Chillies) is used worldwide as spice for making different edible dishes. Powder of this fruit is used for the joint pain. | The stem of this plant is used for making the handles of domestic and agricultural implements. | Whole plant parts are used in the treatment of uretic problem, pulmonary problems and seeds are used as aphrodisiae. | It is used as miswak (tooth brush) for the dental problems. | The young flexible branches of this plant are used for making household baskets and leaves are used as fodder. | This plant provides timber for construction of houses and other domestic things such as boxes, furniture and shelves etc. The leaves of this plant are used as fodder. | The young branches of this plant are used for making special sticks which are locally used for different purposes. | Fruit of this plant is used as tonic and to increase the sexual power in man. | The leaves are browsed by the livestock. However, the wilted leaves are eaten by animals they instantaneously die. The wood of this tree is used for fuel. | It is a fleshy fruit (Pear) and it is also used worldwide for health care. People of the use this fruit as tonic and aphrodisiac. | Fruit of this plant (Peach) is used as tonic in the world. It is very delicious fruit. The wood of this tree is used for making different utensils. |

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DISCUSSION

The present study provides ethnobotanical information about 106 plant species. The prime objective of this study was to record the indigenous knowledge of plant uses by the local people in their daily life for various purposes. Nature has provided abounded plant wealth for all living creatures, which possess medicinal virtues (Bhatti et al., 1998). Plants are used as medicine from ancient time. Medicinal plants are an important source of drugs in traditional system of medicine; a tragedy of the modern time is that the precious ethnobotanical knowledge is disappearing very fast. The present work provides the common names of all these plants in the locally spoken language Burushiski for the first time. While the scientific community identifies plants by their scientific names, common people recognize the plants around them by their common names. Obtaining ethnobotanical information from people or searching certain required plant with the help of local people may not the possible without knowing the common name in their language. The common names therefore have a practical value in that they are essential for connecting specialists and lay people (Sarasa et al., 2012). One can say that common name is the key to the treasure of ethnobotanical knowledge. Since late 50s, almost 80% of the country's population in general and the people in remote areas in particular, have been directly dependant on herbal medicines for all types of medicinal needs (Hocking, 1958).

The traditional knowledge about plant uses is unfortunately fading away with time. With modern education, better income, and accessibility to modern products including food and medicine, people gradually abandon the traditional uses of local plants. According to Sheil and Salim (2012), communities with less wealth and less schooling generally reported a higher proportion of the useful species. In the present study area as well, the ethnobotanical knowledge, particularly that about the medicinal plants is now mostly confined to few aged and poor people. The indigenous knowledge about wild food plants and medicinal plants is in an imminent danger of being completely lost. Therefore there is a dire need to document this information as a heritage for the future generations.

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| and | 102 Umbelliferae Daucus carota L. Ghason Root The aphr | 103 Urticaceae Urtica hyperborean Jacq.ex Jami Leaves This Wodd. | 104 Vitaceae Vitts parvifolia Roxb. Gheeng Fruit The while cultivated) | and a | 105 Zygophyllaceae Peganum harmala L. Spundur Whole plant The |
|---------------------------------|---|--|--|-------|---|
| and other intestinal disorders. | The root of this plant is antiseptic has beneficial influence on kidney, aphrodisiae, tonic, cleanses blood. Seed are aromatic abortificiant stimulant and carminative. | ves This medicinal plant is used for hypertension and it also enhances resistance power of skin and remove the blockage of blood vessels. | | | ole plant The aerial parts of this plant have aesthetic values: |

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