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Leguminosae (Fabaceae) in Tribal Medicines

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According to Sushruta, no plant in this world is useless. A large number of crude drugs used in Ayurvedic system employ plants of family Fabaceae. The family Fabaceae popularly known as legumes, is the third largest order of seed-plants containing about 600 genera with 12,000 species. All the three subfamilies of Fabaceae have been given the status of family and hence they will be treated here as distinct families. Details of medicinal plants of these families and their uses are presented here.

Keyword: Fabaceae, *Acacia*, Tribal medicine, Ethnobotany

1. Introduction

Some ethnobotanical work in India was done in botanical survey of India. The scope, importance and methodology of this field have been outlined by various workers such as Jain (1965), Mitra and Jain (1991) Kumar (2000) Maheshwari and Singh (1984). The ethnobotanical studies were carried out in different parts of India by various workers as Shivani and Kumar (2000, 2002), Gupta and Kumar (2000, 2002a, b), Mishra and Kumar (2001 a,b), Kotia and Kumar (2000, 2001), and Trivedi (2002). The application of herbal medicines has been studied by and Seema and Kumar (2004 and 2005) Sharma and Kumar (2006, 2007), Singh et al., (2010) and Sharma and Kumar (2011) Sharma et al., (2011).

2. Results and Discussion

Results are presented in table 3.1 to 3.4.

I. Family Papilionaceae (Fabaceae):

The members of family Papilionaceae are herbs, shrubs or trees found in all climates but mostly

between and near the tropics and are more abundant in the old than in the New World. The family includes the greatest number of Legumes, comprising 400 genera with about 7000 species. It is an extremely important family and its members yield nutritious food, fiber, shelter, valuable medicines and also virulent poisons (Datta and Mukherji, 1952).

The members exhibit most varied properties, some are amylaceous, other oleaginous, many yield resins, balsams and dyes, a few are astringent, acrid and bitter, narcotic and poisonous, emetic and purging, tonic and restorative. The seeds are often anti periodic and the root anthelmintic.

Some of the important genera are *Abrus* sp., *Alhagi* sp., *Arachis* sp., *Butea* sp., *Cajanus* sp., *Cicer* sp., *Derris* sp., *Glycine* sp., *Glycyrrhiza* sp., *Medicago* sp., *Pisum* sp., *Phaseolus* sp., *Psoralea*

sp., *Sesbania* sp., *Tephrosia* sp., *Vicia* sp. and *Vigna* sp..

Medicinal plants of family Papilionaceae are given in table 3.9.

1. *Butea monosperma* O Kuntze. 'Palas'

The Oraon and Korwa tribes of Madhya Pradesh make the root decoction and used it in urinary troubles. The bark decoction is used in loose motions. Andh, Bhil, Gond, Halba, Kokna, Korku and Malhar tribes of Khandala region in Maharashtra use its flowers for urinary complaints. Fresh or dried flowers are crushed and mixed with water. One cup of extract is given for proper urination. Santals of Santal pargana in Bihar use its roots for tuberculosis. It is also known as depurative, aphrodisiac, astringent, anthelmintic, rubifacient, antidote to snake bite and it is also used for diarrhoea, piles, tumours, dysentery and herpes.

2. *Flemingia chappar* Ham. 'Salpan':

In Bihar the people of santhal tribes use 1 to 2 drops of juice extracted from pressed seeds put in the eyes as a remedy in eye troubles and to remove cataract. In Madhya Pradesh this plant is also known as 'Galphule', in Gamharia (Raigarh) of Madhya Pradesh, the leaf juice mixed with seven drops of mustard oil and a little amount of jaggery is used in eye pain by the tribal people.

3. *Flemingia congesta* Roxb. 'Mahadeokama':

In Gamharia (Raigarh) of Madhya Pradesh, the root decoction 50 ml. is administered orally three times daily in spermatorrhoea by the tribal people.

4. *Indigofera cassiodies* Rottle ex DC 'Jhilla':

The Kusmi tribal people of Madhya Pradesh use the root of the plant powdered with bark of Tendu (*Diospyros melanoxylon* Roxb.) and half teaspoonful powder prescribed to women for preventing conception.

5. *Indigofera linnaei* Ali. 'Runkhadi':

Inhabitants of Gujrat and South East Rajasthan take about 10 gm. fresh juice of

whole plant, mixed with curd and give once a day (or if needed twice) to cure diarrhea. Rice with such curd should be taken as a diet during treatment and no sugar or salt should be used in the diet.

6. *Alysicarpus vaginalis* Linn. DC. 'Davai': It is known for cough. Santhals of Santhal Pargana in Bihar use its root as an antifertility agent.

7. *Atylosia scarabaeoides* Benth. 'Banherwa': In Raigarh (Aeppu) of Madhya Pradesh the tribal people use the plant decoction (100 ml.) as a tonic after delivery. The fresh leaf paste is applied on swellings of leg. The pod are also eaten for this purpose. In Bihar tribal people make plant or root into a paste and mix with coconut oil to apply on head for fifteen days to check falling hairs to cure baldness (Tarafdar and Chaudhari, 1997).

8. *Atylosia volubilis* Blanco. 'Gamble': Inhabitants of Orissa use its root for mumps. The root is made into a paste and applied locally.

9. *Clitoria ternatea* Linn. 'Aparajit': Inhabitants of Dhasan valley in Bundelkhand region of Utter Pradesh apply the powdered root externally for the treatment of gotire. In India it is also used as cathartic, diuretic and antidote against snake bite. It is also useful against leprosy.

10. *Crotolaria alata* Ham. 'Gunghra': In Gamharia (Raigarh) of Madhya Pradesh the Oraon tribal people use to rub the paste of the whole plant on the body for curing joints and muscular pains. The root decoction 50 ml. is used 5 times daily in scorpion stings and in snake bite.

11. *Crotolaria albida* Heyne. 'Banmethi': The tribes of Ambikapur in Madhya Pradesh use give about 2 gm. powdered root twice a day to a victim of snake bite.

12. *Crotolaria bialata* Heyne. 'Murgijori': The Kurmi Mahato tribes of Bihar use root paste three times for nine days in discharge of blood with urine.

13. *Crotolaria pallida* Dry. Syn. C.Striata DC. 'Thankur': Mikirs of Assam take about 20

ml. extract of leaves in early morning to kill intestinal worms.

14. *Crotolaria semialata* Linn. 'Gulabi': The Kurmi tribes of Madhya Pradesh use about half tea spoon powdered root for malarial fever .
15. *Crotolaria sericea* Retz 'Ghurhiti': The tribes of Ambikapur, use the roots of this plant and *Byttneria herbaceae* Roxb. They are powdered and 2 gm. of this powder is used for curing gonorrhoea .
16. *Crotolaria spectabilis* Retz 'Sonokai': In Bihar Oraon and Khond tribes used plant paste in rheumatism twice daily for fifteen days. The patient should take it with an empty stomach one hour before his meal. Another method of tribal use is the fresh plant swept over the body of a patient three times daily for fifteen days .
17. *Crotolaria prostrata* Rottl. 'Bilaiban': Oraon and Korwa tribes of Madhya Pradesh made the twigs into pieces and used in nabhi treatment.
18. *Desmodium gyroides* (Lamk.) DC.: Inhabitants of Hazaribagh district of Bihar use its whole plant to promote conceptions. The plant is made into paste with 4 leaves of *Ocimum sanctum* (sacred Tulsi), put in a banana and given to a lady for conception.
19. *Desmodium motorium* DC. 'Jugni': In Gamharia (Raigarh) of Madhya Pradesh the leaves are used for hypnotizing tribal women in the treatment of diseases by the tribal people.
20. *Desmodium pulchellum* Benth. 'Jat salpar': In Bihar, Bihar tribal people made root into a paste and mixed with sugar candy. This is prescribed to a patient suffering from burning sensation in the abdomen or chest once in the morning on an empty stomach and another dose in the evening. (Tarafdar and Chaudhri, 1997).
21. *Desmodium triflorum* DC. 'Ban': In Basantpur (Surguja) of Madhya Pradesh, the plant decoction 30ml. is used three times daily in wormicide by the tribal people.

II. Family: Caesalpinaceae

The members of family Caesalpinaceae are trees, shrubs or rarely herbs numerous in the Tropics. They scarcely extend beyond the tropical belt in the old world and they are rather few in North America. The sub family includes 56 genera with about 650 species. The members exhibit mostly tonic, astringent and mucilaginous properties, some have a pectoral and laxative or cathartic action; others are anthelmintic antiseptic, antipyretic, styptic. Some of the important genera are *Bauhinia* sp., *Cassia* sp., *Cynometra* sp.

1. *Bauhinia purpurea* Linn. 'Khairwal': In Raigarh (Sisraingha) the tribal people used the stem bark decoction (50 ml.) three times daily in body pain and fever. The young leaves and buds are cooked as food. Santhals, Bhumij, Birhors and Kherias of West Bengal apply paste of its bark on sores of small-pox (Jain and De, 1966). Nagas of Nagaland use its bark for curing cancerous growth in stomach (locally known as 'Chapo'). Paste of bark is given internally. Among the inhabitants of Dharmपुरi Forest Division in Tamil Nadu, the leaf – paste of this plant mixed with milk (latex) of *Jatropha curcas* is administered to cure jaundice. It is also known as anthelmintic, diuretic, astringent, carminative and for diarrhoea.
2. *Bauhinia purpurea*: In Sisraingha (Raigarh) of Madhya Pradesh the Korwa tribal people make the root paste and mixed with jaggery and ghee and used it in bone fracture. Seeds are roasted and eaten. Leaves are used for making plates by korwa tribe.
3. *Bauhinia variegata* Linn. 'Guiral': It is known as astringent, carminative, alterative, anthelmintic antidote to snake poison and laxative and used for dysentery, diarrhoea, skin disease, ulcer, piles and leprosy. Inhabitants of Garhwal Himalayas use its bark for malaria .
4. *Caesalpinia pulcherrima* (Linn.) Swartz. 'Puraiphul': It is used as an abortifacient, febrifuge, purgative, emmenagogue, tonic, stimulant and for asthma, bronchitis and malarial fever. Seeds and some common

salts are made into a paste and applied on ring worm. Kondh, Bhumij and Saora tribes of Orissa use the decoction of its fresh seeds for pain in gums due to inflammation. It is also used as tonic, purgative, stimulant, abortifacient, emmenagogue, febrifuge and also used for bronchitis, asthma and malarial fever.

5. ***Cassia auriculata* Linn. 'Anwal, Avaram'** Syn ***Senna auriculata*** : Tribals of Eastern Rajasthan use the extract of its seeds for asthma. Inhabitants of Maharashtra use its root extract for rheumatism pain. The root are mixed with *Maytenus emarginatus* roots. In India it is used as astringent and anthelmintic, used for urinary complaints, skin affection, diabetes, and ophthalmia.
6. ***Cassia occidentalis* Linn. 'Dhendheni'**: In Kundi (Surgiya) of Madhya Pradesh the tribal people use the twigs as tooth brush.
7. ***Cassia sophera* Linn. 'Raw Asan'**: Bhoja of U.P. use its leaves for piles. In India it is used as diuretic, purgative and antidote to snake bite and used for ring worm and bronchitis. The leaf paste with Neem oil is applied locally, it relieves itching and pain .
8. ***Cassia tora* Linn. 'Panavar'** Syn. ***Cassia obfusifolia* L., *Senna obfusifolia* L.**: In Bihar the Oraon and Khond tribes, make root into a paste and along with the powder prepared from the horns of a cow, given orally once daily in high fever and to a patient who are unable to speak and hear. In Raigarh (Aeppu) of Madhya Pradesh the tribal people make the seed powder and mixed with tea and is used 2-3 times daily in cough, headache and fever. In Madhya Pradesh the tribals of Ambikapur district take stem and seeds in equal quantities are boiled in water and filtered by tribals and about 100 ml filtrate taken orally twice a day for 5 to 10 days as an anti-asthmatic drug. The young leaves are cooked as vegetable. In India it is used as laxative, antidote to snake bite

and purgative. It is used for skin affection, itches and ring worm.

9. ***Cassia occidentalis* is also used in tribal medicine.**

iii. Family: Mimosaceae:

The members of sub family Mimosaceae are trees or shrubs, very rarely herbs. They are found in the tropical zone and are especially numerous in Africa and Australia. They are rare in the sub-tropical region of the northern hemisphere. The member exhibit tonic and astringent, emetic, antiperiodic and anthelmintic properties. Many yield demulcent gums.

The sub family of Mimosaceae includes 23 genera with about 550 species. Some of the important genera are *Acacia* sp., *Albizia* sp., *Entada* sp., *Leucaena* sp., *Neptunia* sp., *Prosopis* sp., *Parkia* sp., *Mimosa* sp., *Pithecolobium* sp.

1. ***Entada pursaetha* DC. ssp. *sinohimalyensis* Grierson and Long. Syn. *E.scandens* Auct. 'Pangra'**: Inhabitants of Sikkim apply the paste of its kernel locally to cure mumps. . Gond, Halba and Maria tribes of Abujmarh area in Madhya Pradesh use the paste of the seeds for curing paralysis. The paste is rubbed on the affected part 3-4 times a day.
2. ***Acacia chundra* (Rottl.) Willd. Syn. *Acacia sundra* DC. 'Kair'**: Bhils, Nayakas and other tribal communities of Gujrat, use its wood for leucoderma. Paste of wood is applied locally.
3. ***Acacia nilotica***: Commonly found in Rajasthan has great medicinal value.
4. ***Albizia lebbek* Benth. ' khairi'**: Fresh decoction is used three times daily in stomach troubles and dysentery in Bihar by many tribes.
5. ***Neptunia triquetra* Bent. 'Lajalu'**: Kols, Gonds, Lodhs and Gujars of Banda district in Uttar Pradesh give extract of its root for dysentery. Besides these plants *Acacia senegal*, *Acacia leucopholea*

Table 3.1: Plant Used in Musical Instruments

S. No.	Name of the Plant	Parts used	Musical instruments
1.	<i>Acacia leucophloea</i>	Wood	Dhol
2.	<i>Acacia nilotica</i>	Fruit	Ghungroo
3.	<i>Ailanthus excelsa</i>	Wood Leaves	Dholak, Chhang, Papaya
4.	<i>Albizia procera</i>	Wood	Dholak
5.	<i>Boswellia serrata</i>	Wood	Dholak, Tambura
6.	<i>Butea monosperma</i>	Wood Leaves	Dholak Papaya
7.	<i>Cassia tora</i>	Leaves	Papaya
8.	<i>Dalbergia sissoo</i>	Wood	Dhol

Table 3.2: Plants Used for Female Disease

S. No.	Name of plant	Official organ	Ailment	Mode of Administration
1.	<i>Abrus precatorius</i>	Seed	Increase scanty menstrual flow	Powder taken orally after menstruation
2.	<i>Acacia nilotica</i> subsp. <i>indica</i>	Pods	Leucorrhoea	Paste taken orally with milk
4.	<i>Butea monosperma</i>	Bark	Protrusion of uterus	Decoction orally
5.	<i>Cajanus cajan</i>	Fruit	Galactagogus	Orally

Table 3.3: Plants Used as Birth Control

S. No.	Name of the Plant	Official organ	Mode of Administration
1.	<i>Abrus precatorius</i>	Seed	Powder taken orally with water during menstruation
2.	<i>Butea monosperma</i>	Gum	Orally with water for a week

Table 3.4: Plants of Sub-family Papilionaceae (Family Fabaceae)

S. No.	Common name in Hindi	Common name in English	Botanical name	Part used
1.	Chirmiti	Crab's eyes, Indian Liquorice, Rosary pea, Rati seed	<i>Abrus precatorius</i> Linn.	Roots, leaves and seeds
2.	Javansa, Jawasa, Junwasa, Juwasa, Yavasa.	Arabian Manna Plant, Camel Thorn Persian Manna Plant	<i>Alhagi camelorum</i> Linn.	Twig root and leaves
3.	Arhar, Thur & Arhar dal	Pigeon pea, cango pea, Dal.	<i>Cajanus indicus</i> Spreng.	Seeds, leaves and flowers
4.	Barasem, Gojiaseme, Sem	Broad Bean, Sword Bean	<i>Canavalia ensiformis</i> DC.	Leaves
5.	Chan, Chunma	Chick pea, Horse gram, Black gram, Brown gram.	<i>Cicer arintinum</i> Linn.	Seeds
6.	Aparajita, Aprajit, Kalijer, Kowa, Shobanjan, Vishnukranti	Blue pea, Mussel shell, creeper	<i>Clitoria ternatea</i> Linn.	Root, leaves, seeds, stem and flower.
7.	Ghunghunian	Devil Bean, Wedge – leaved Crotalaria	<i>C. retusa</i> Linn.	Roots and leaves
8.	Basam, Bansham, Jhunjhunia	Warted crotalaria	<i>C. versucosa</i>	Leaves and root
9.	Shisham, Shisu, Sistal, Paharisissu	Blackwood of south India, Bombay blackwood.	<i>D. latifolia</i> Roxb.	Whole plant
10.	Shisham, Sisam, Sissai, Sissu, Sisu	South Indian Redwood, Sissoo	<i>D. sissio</i> Roxb.	Bark, leaves, oil and wood
11.	Gonj	Hog, Creeper	<i>Derris scandens</i> Benth	Bark
12.	Salpan, Salpani, Salun, Salwan, Shalpani	Tick Trefoil	<i>Desmodium gangeticum</i> DC.	Root
13.	Gahat, Kulat, Kultha, Kulthi, Kulti, Kurti	Horse Grain, Horse gram, Kooltee, Madras gram	<i>Dolichos biflorus</i> Linn.	Pulse
14.	NA	NA	<i>D. falcatus</i> Klein.	Root and seeds
15.	Bhatvasu, Lobia, Bhetarasu, Makhanism	Egyptian Bean, Indian Bean, Kidney Bean	<i>D. lablab</i> Linn.	Seed and leaves
16.	Mandara, Paltamandara, Pangara, Pangra, Panjira	Red bean tree, Indian coral tree, Bastard teak	<i>Erythrina indica</i> Lam.	Bark and leaves
17.	Dauldhak, Madar, Madara, Nasut, Pangara, Rowanna, Rungra	Corky Coral tree	<i>E. suberosa</i> Roxb.	Bark
18.	Jethimadh, Joshtimadhu	Liquorice	<i>Glycyrrhiza glabra</i> Linn.	Root, leaves and drug
19.	Bhat, Bhatwan, Ramkurthi	China bean, Japan bean, Soy bean, White bean	<i>Glycine Soja</i> Sieb. & Zucc.	Root
20.	Surmainil	Surat indigo, Wild indigo	<i>Indigofera argentea</i> Linn.	Root, leaves and seeds
21.	Gouli, Lil, Nil, Nir.	Common Indigo, Indigo	<i>I. tinctoria</i> Linn.	Root and leaves
22.	Masur, masuridal	Lentil	<i>Lens esculenta</i> Moench.	Seed

23.	Banmethi, Metha, Marvo, Gorhadal, Sinji	Small Melilot	<i>Melilot indica</i> All	Whole plant
24.	Aspurk	King's Clover Melilot trefoil	<i>M. officinalis</i> Lam.	Plant
25.	Cowage, Cowhage, Cowitch	Gaunch, Goncha, Kaunch, Kawanch, Kivach, Kivachh, Kivanchh, Konch, Kuyach.	<i>M. prurita</i> Hook.	Root, fruit, pod, seeds, leaves and branches
26.	Asainda, Kalaphulas, Pamar, Sandan, Timsa, Tinnas	Chariot Tree, Sandan	<i>Ougeina dalbergioides</i> Benth.	Bark
27.	Urad, Moth	Kidney Bean	<i>Phaseolus aconitifolius</i> Jacq.	Pulse
28.	Butter Bean, Curry Bean, Lima kidney Bean	Hursumhulle pullie	<i>Phaseolus lunatus</i> Linn.	Pulse
29.	Harrimung, Mung	Mung, Green Gram	<i>P. mungo</i>	Pulse
30.	Dord, Mung, Urid, Urud, Thikiri	Black Gram, Green Gram, Mung Pulse	<i>P. radiatus</i> Linn.	Pulse, root and seeds
31.	Mugani, Mugawana, Rakhai Kalai, Trianguli	3- Lobed kidney bean, Wild kidney bean	<i>P. trilobus</i> Ait.	Leaves
32.	Bakla, Loba	French Bean, Kidney Bean	<i>P. vulagris</i> Linn.	Flour and bean
33.	Baramattar, Battanichola, Golmattar.	Garden pea, Blue pea.	<i>Pisum sativum</i> Linn.	Seed and peas
34.	Kanja, Karanj, Karanjaka, Kirmal	Indian Beech	<i>Pongamia glabra</i> Vent.	Root, oil, leaves, seeds and bark
35.	Banda, Bija, Bijasal, Paisar	Bijasal, Indian kino tree.	<i>P. marsupium</i> Roxb.	Gum, bark and leaves
36.	Lalchandan Ragatchandan	Red Sandal Wood, Red Sanders, Ruby wood.	<i>P. santalinus</i> Linn. fil.	Wood and legume
37.	Brihatchakramed	Dhumchee hemp	<i>Sesbania aculeate</i> Poir.	Seeds
38.	Dhandiain Jaint, Jaint, Jait, Janjhan, Jayanti, Rasin, Jhijan	Egyptian Sesban	<i>Sesbania aegyptiaca</i> Poir.	Seeds, Leaves and Root
39.	Sarphoka, Sarphonka, Sarphuka	Wild indigo	<i>T. purpurea</i> Pers.	Root and whole plant
40.	Khulbi, Lassan, Methi, Muthi, Sag methi	Fenugreek, Greek Hayes.	<i>Trigonella Foenum – graecum</i> Linn.	Seeds and leaves
41.	Anhuri, Bakla	Broad Bean, field bean, Garden bean	<i>Vicia faba</i> Linn.	Shoot and beans
42.	Akra, Ankra	Common Vetch, Tare, Vetch	<i>Vicia sativa</i> Linn.	Seed
43.	Bora, Chowli, Lobia, Ransi, Rausa, Rawas, Rianish, Sonta	Asparagus Bean, Blackeye Pea, Chinese Bean, Chowlee, Cow pea, Cuba bean, Rice bean, Small fruited bean.	<i>Vigna catiang</i> Walp.	Pulse and seeds

3. References

- Gupta, R. and Kumar, A. 2000. Ayurvedic Crude Drugs as Potential (Cure of Diabetes. International Journal Mendel Vol. 17 (3-4) Pg.127-128.
- Gupta, R. and Kumar, A. 2002a. Searching for anti-diabetic agents among Ayurvedic crude drugs. Int. J. Mendel. 19 : 9-10.
- Gupta, R. and Kumar, A. 2002b. Ethnobotanical and Ayurvedic applications of Methi-Trigonella foenum-graceum Linn. Int. J. Mendel. 19(3) : 124.
- Jain, S.K. 1963. Studies in Indian ethnobotany . Origin and utility of some vernacular plant name. Proc. Natl. Acad. Sci. India 33:525-530
- Kumar, A. 2000. Traditional Indian Ayurvedic Medicines : Some potential plants for bioenergy, medicine from India. Institute of Natural Medicine, Toyama Medical and Pharmaceutical University, Japan. 27 : 3-15.
- Maheshwari, J.K. and Singh, J.P. 1984. Contribution to the ethnobotany of Bhoja tribe of Bijnor and Pauri Garhwal district, Uttar Pradesh J. Econ. Bot. 5(2) : 251-259.
- Mishra, A. and Kumar, A. 2001a. Medicinally important trees of Rajasthan. Int. J. Mendel. 18 : 37-38.
- Mishra, A. and Kumar, A. 2001b. Studies on Ayurvedic crude for the cure of urinary tract stones. Int. J. Mendel. 18(1-2) : 41-42.
- Mishra, A. and Kumar, A. 2000a. Ayurvedic Medicinal plants for Skin disease. International Journal of Mendel Vol.-17(3-4) Pg. 91-92.
- Mishra, A. and Kumar, A. 2000b. Medicinally important trees of Rajasthan. International Journal of Mendel Vol.-18 : 37-38.
- Mishra, A. and Kumar, A. 2001. Studies on Ayurvedic Crude Drugs for the cure urinary tract Stones. International Journal of Mendel Vol.-18(1-2) Pg. 41-42.
- Mitra, R. and Jain, S.K. 1991. Medicinal plant Research in India. An overview Ethanobotany 3: 65 – 77.
- Seema and Kumar, A. 2004. Importance plants in present scenario. Int. J. Mendel. 21(1-2) : 29-30.
- Seema and Kumar, A. 2005. Study of some traditional medicinal plants used by tribal peoples of Rajasthan in human ailments. Int. J. Mendel. 22 : 47-48.
- Sharma, L., and Kumar, A. 2006. Antimicrobial activity of Agertum conyzoids Linn. A Plant with extra medicinal value. Asian J. Exp. Sci. 20(1) : 41-46.
- Sharma, H. and Kumar, A. (2011): Effect of plant growth regulators and chemical fertilizers on plant growth and productivity of Chlorophytum tuberosum and Pergularia daemia Journal of Medicinal Plants Research 5, 2647-2651
- Sharma, M., Sharma, A. and Kumar, A. (2011): Ethnopharmacological importance of Asparagus racemosus: A review. journal of pharmaceutical and biomedical sciences 6, 1-13.
- Shivani and Kumar, A. 2000. Ayurvedic Medicinal plants for Skin disease. International Journal of Mendel Vol. (3-4) : 105-106.
- Shivani and Kumar, A. 2002. Some important medicinal plants of family Solanaceae used in Ayurvedic system of medicines. International Journal of Mendel Vol. 19 : 97-98.
- Singh, K.P., Upadhyay, B., Prasad, R. and Kumar, A. (2010): Screening of Adhatoda vasica nees as Putative HIV-Protease inhibitor. Journal of Phytology Phytopharmacology 2, 78–82.