



DOCUMENTATION OF TRADITIONAL KNOWLEDGE ABOUT USES OF MEDICINAL PLANTS FOUND IN KIRTHAR NATIONAL PARK, DISTRICT DADU, SINDH, PAKISTAN

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Article Received on: 12/10/12 Revised on: 19/11/12 Approved for publication: 02/12/12

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ABSTRACT

National Parks are diverse habitats for different medicinal plant species. Keeping the diversity and variation in view twenty one different areas in Pakistan have been declared as National Parks. Kirthar National Park is the second largest protected area of Pakistan, situated at a distance of about 80 Km in northeast of Karachi. Internationally the region is classified as Saharo Sindian region's inhabited by three different ethnic groups, viz. Burfat, Gabool and Rind having different ways of life, beliefs, and traditions. Plants of this region have inordinate medicinal importance and native communities have been utilizing local flora for medicinal purposes over generations. Information about medically important plants is available sporadically with local people. A total of 50 plant species (trees, herbs and shrubs) of 31 families were evidence to be used for medicinal purposes by the local inhabitants. More than 150 local Hakims, senior citizens and farmers were interviewed for this purpose. Hopefully this kind of information will also generate wide interest in protecting and preserving diversity of plant species with medicinal importance. Due to the deaths of old people and changing trends, the valuable traditional medicinal knowledge is depleting from minds, this study could be helpful in conservation perspective of medicinally important plant species of Kirthar and traditional knowledge about their uses.

KEYWORDS: Kirthar flora, medicinal plants, traditional medicines, ethnomedicinal

INTRODUCTION

Kirthar National Park is the third largest national park of Pakistan with an area spread over 308,733 hectares, situated in the foothills of Kirthar range (Latitude: 25° 47' 22" N Longitude: 67° 47' 40" E)(Wildlife of Pakistan 2002). The park is classified as protected area category II by the IUCN established by Government of Sind on 13th January, 1974¹. It supports an undisturbed and well preserved indigenous flora and fauna which are probably not represented anywhere in Sind. The local inhabitants of the park include three main tribes viz. Burfat, Rindh and Gabool living in small villages (Goths) scattered throughout the park. Baluchistan province bounds the park from west and Sambok Game Reserve from East, and Mehl Kohistan Wildlife Sanctuary is in the south. The park is characterized by low rocky mountain ranges, separating undulating valleys extending from north to south. The altitude varies from 70m at Hub Dam to 1125m at Kirthar Mountain.

The climatic data of nearby stations viz. Karachi and Hyderabad was taken as the representative of the region because no metrological station is present in the study area. This area has Hot and arid climatic condition with very little rainfall It can be classified as an arid tropical climate under the Thornthwaite Scheme and as semi-arid or steppe with a dry winter according to Koppen Scheme (1931)².The rainfall received in this area is 75mm on an average maximum during Monsoon period i.e. from late June to September. The summer temperature on an average lies between 44°C to 48°C while in winter season temperature fluctuates between 30to 35°C during day and 10°C to 15°C during night. The Kirthar National Park entirely falls under the region of Saharo-Sindian or Sudanian region^{3,4}.The area is mainly under xerophytic vegetation, sparse and dominated by spiny thorny shrubs, bushes and some tree species along with large number of ephemerals.

Most of the plants of Kirthar National Park has medicinal properties and used by the local inhabitants for generation after generations. Although some sporadic information is available about traditional use of plants by locals, such as that of Hooker *et al*⁵, Stewart *et al*⁶, Ali & Nasir *et al*^{7,8}, Ahmad & Khan *et al*⁹, Bokhari *et al*¹⁰, Ali *et al*^{11,12}, Ghafoor *et al*¹³, Qaiser & Nazimuddin *et al*¹⁴, Qureshi *et al*¹⁵.

Use of medicinal plants has plagued humans throughout their history. Medicinal plants are an important part of our life in the present days. In nature there are thousands of plant species but in them there are very few which when consumed causes major life-threatening illnesses. In the world about 5000 taxa with 400000 plant species have been identified for their use as medicinal plants. In this only 1% of indigenous culture surveyed for knowledge of natural plants^{8, 17-22}. The plant species are helpful to withstand life because humans consume large number of plants²³⁻²⁸.

It is expected that this information will be highly useful for the plant Scientists, Herbalists, general public and it will also generate wide interest in protection and conservation of floral diversity.

MATERIALS AND METHODS

A number of field visits were conducted in the study area and information regarding medicinal properties, their uses and local names of plants of area was obtained from local inhabitants of various ethnic groups throughout fieldwork, questionnaires based interviews and conversations were held with aged nomads. Some information was also obtained from existing literature related to medicinal plants.

Collections were done periodically from different parts of the park, ultimately the whole area in all flowering/growing seasons for two years. Collected plant material was processed and identified at National Herbarium (RAW) with the help of Flora of Pakistan (series 1-208) and other existing taxonomic literature. The specimens were preserved as voucher

specimens in National Herbarium NARC (RAW) at Islamabad.

RESULTS AND DISCUSSION

On the basis of the interviews conducted to collect the data regarding the traditional use of local flora by the inhabitants

of KNP for treatment of various human ailments, it reveals that following 50 plant species of medicinal importance belonging to three monocot and twenty eight dicot angiospermic families were recorded from Kirthar National Park and described in Table 1.

Table 1: Medicinal Flora of Kirthar National Park

Scientific Name	Local Name	Family	Part used	Folk Medicinal Uses
<i>Abutilon indicum</i> L.)Sweet.	Patteer	Malvaceae	Leaves, root, seeds	The leaves are demulcent and used against bronchitis, diarrhea, gonorrhoea, urethritis and bladder inflammation. Root is diuretic and used in hematuria and leprosy. Seeds are aphrodisiac, laxative and demulcent.
<i>Acacia nilotica</i> (Linn.) Del.	Bubur	Mimosaceae	Leaves, pods	Bruised leaves used for the treatment of eyesores in children. Pods soaked in cow's milk and dried in shade, ground and mixed with sugar are given in sexual impotency. The pods and leaves are astringent in diarrhea.
<i>Acyranthus aspera</i> L.	Ubatkandi, Puth kanda	Amaranthaceae	Whole plant	The plant has properties against hydrophobia, snake bite, scorpion bite, ophthalmia, skin diseases, and for kidney stones. The plant has also been used as astringent, diuretic, emetic, purgative, and in dropsy piles, skin eruptions and colic diseases.
<i>Aerva javanica</i> (Burm. F.) Juss. Ex. J. A. Schultes	Bhu	Amaranthaceae	Roots, leaves	Decoction of root is used to cure skin infections in animals and to expel animal worms. Poulitice of leaves is used for pain and inflammations.
<i>Albizia lebbek</i> (L.) Benth.	Siris, Shirin	Mimosaceae	Seeds, flowers, leaves,	Seeds are used for piles and astringent in diarrhea, flowers for boils swellings and antidote for poisons; leaves in ophthalmia; powdered bark in ulcers and snake bite; oil from seeds for white leprosy and bark is applied to sore eyes.
<i>Alhaji maurorum</i> Medic.	Kandero	Papilionaceae	Leaves, roots	Juice of the fresh leaves is used to relieve soreness of eyes whereas the paste of the root is used for external treatment of swellings.
<i>Aloe vera</i> L.	Kanwar gandal	Liliaceae	Whole plant	It is used as aspirant and also emmenagogues when mixed with iron. Fresh juice is cathartic and cooling, used in fevers and for cleaning the skin.
<i>Anagalis arvensis</i> Linn.	Dhabar, Chonk mari	Primulaceae	Whole plant	It is used to intoxicate fish and to expel leeches from the nostrils. It is also used in cerebral affections, leprosy, hydrophobia and dropsy.
<i>Asparagus racemosus</i> Willd.	Satawar	Liliaceae	Roots	The root is used in special diseases and has also demulcent, diuretic properties in veterinary medicines. It is also used as refrigerant and antiseptic.
<i>Azadirachta indica</i> (L.) Juss.	Neem	Meliaceae	Whole plant	All the parts of plant are really valuable. The bark is a febrifuge and substitute for quinine; the leaves act as a cataplasm for wounds and sores; the seed oil is used as an anthelmintic activities and foul sores. The decoction of leaves and young shoots is an excellent blood purifier. The leaves are also useful in skin diseases, externally applied on wounds and ulcers in the form of poulitice, ointment and lineament. Juice of leaves is anthelmintic and is locally used in jaundice.
<i>Barleria acanthoides</i> L.	Kinari, Kandan wari booti	Acanthaceae	Whole plant	An annual or perennial herb. Its decoction is used in cold as well as malarial fevers.
<i>Bauhinia racemosa</i> Lamb.	Asando	Caesalpiniaceae	Bark, roots, flower	The bark or the plant is astringent and used in diarrhea, root is carminative, and flowers are laxative.
<i>Blepharis scindica</i> Stocks ex t. Anders	Asad	Acanthaceae	Seeds	Seeds are locally used as a cure for earache.
<i>Boerhaavia procumbens</i> Roxb.	Dakhri, Satti	Nyctaginaceae	Whole plant	The roots of this plant are said to be medicinal and used as purgative. Similarly the juice of the whole plant is considered as diuretic.
<i>Calligonum polygonoides</i> L.	Phog	Polygonaceae	Roots, flower buds	Rarely found in this area. The juice of its roots is used by nomads as gargle for the treatment of sore throat. The flower buds are also used as vegetable.
<i>Calotropis procera</i> (Linn.) Aiton f.	Akk, Akro	Asclepiadaceae	Seeds, buds, root, bark	Its latex is said to be irritant to skin and may cause blindness. The seed floss is used for stuffing pillows whereas its leaf buds are said to be eaten by locals to cure snake bites. The root, bark and juice are used extensively for their emetic, diaphoretic, alterative and purgative properties.
<i>Caralluma tuberculata</i> N.E Brown.	Marmoot	Asclepiadaceae	Whole plant	A leafless perennial succulent; with erect, fleshy, thick and four angled toothed stem. Juicy stem is bitter, tonic, febrifuge, stomachic, carminative, blood purifier and useful in rheumatism. Also used as vegetable.
<i>Cardiospermum helicacabum</i> L.	Kanphuti	Sapindaceae	Leaves, roots, seeds	Plant juice is regarded as emmenagogue, demulcent and anthelmintic. Leaves are stimulant and diuretic. Leaves coated with castor oil are externally applied on rheumatic joints and swelling tumors. Leaf juice is curative for earache. Root is diuretic, diaphoretic, emetic, laxative, aperient, and stomachic. Seeds are used as tonic in fever.

<i>Cassia italica</i> (Mill.)Lam.	Ghorawal Senna, Dadwhal	Caesalpiniaceae	Leaves,	Leaves are purgative, anthelmintic, laxative and used for constipation, gout, rheumatism, skin diseases and against intestinal worms.
<i>Celosia argentia</i> Linn.	Sarwari	Amaranthaceae	Seeds	Its seeds are aphrodisiac used in diseases of eye and blood and mouth sore, also said to be a good remedy for diarrhea.
<i>Chenopodium album</i> Linn.	Chill, Bathu	Chenopodiaceae	Whole plant	It is used in sexual disorders and as laxative in spleen and bilious disorders and is also used as vegetable.
<i>Citrullus colocynthis</i> (L.) Kuntze.	Trooh, Guch, Tumba	Cucurbitaceae	Fruits, seeds	It is common creeper of sandy plains of this area. Its fruits and seeds are used as purgative whereas roots are used for the treatment of jaundice, urinary diseases and rheumatism. The fruit affords a safe and active cathartic in hepatic and visceral congestion.
<i>Cleome viscosa</i> Linn.	Hul hul, Hur hur,	Capparidaceae	Seeds, leaves, roots	The seeds and roots are considered anthelmintic, the leaves are used as a vesicant, boiled leaves in clarified butter are applied to wounds and the juice is used in ulcers. The root is administered in decoction as a febrifuge.
<i>Commiphora wightii</i> (Arnot) Bhaudari.	Gugur	Burseraceae	Gum	Gum which is known as "gugur" is demulcent, apparient, carminative, antiseptic, alternative, expectorant, and aphrodisiac. Used in ulcer, pyorrhea, chronic tonsillitis, pharyngitis, syphilis and other skin diseases. Internally used as uterine stimulant emmenagogue. It is also said to regulate menstrual disorder.
<i>Corchorus depressus</i> (L.) Stocks.	Bhu phalli Mundheri	Tiliaceae	Leaves, seeds	Leaves are emollient, cooling and act as tonic. The decoction of seeds is used as energizer. Mucilage is also used as tonic and to treat gonorrhoea.
<i>Cordia ghraf</i> (Forssk.) Ehren ex Sch.	Liar	Boraginaceae	Bark	The decoction of bark is astringent and used as gargle.
<i>Cymbopogon jawarancusa</i> (Jones) Schult	Poi, Khawi, Kattan	Poaceae	Whole plant	A decoction of the leaves, flowers and roots is given for seasonal fevers and catarrhal complaints. It has cooling, stimulant, diuretic, and carminative properties. For 12 hours the plant is soaked in water and added with an appropriate quantity of sugar (gurh). Mixture is then boiled and used for coughs, asthma, and tuberculosis. In fresh plant is burnt in sesamum oil is externally applied for backache, rheumatic pain and other acute pains. The plant is crushed and a poultice is made, which is applied over painful joints and inflamed areas. An infusion of plant is used as gargle which is helpful in toothache and strengthen gums.
<i>Cynodon dactylon</i> Pers.	Chabar, Dub	Poaceae	Root, leaves	This grass yields a cooling decoction from the roots and young leaves found useful in fever.
<i>Cyperus rotundus</i> Linn.	Kul	Cyperaceae	Tubers	The tubers are held to be diaphoretic, diuretic; astringent, stimulant and anthelmintic.
<i>Cyperus sp.</i>	Kulo	Cyperaceae	Whole plant	This plant is found in dry, rocky and sandy places having a height of about 20-30 cm. Its decoction is prepared after soaking in water for twelve hours and then used for cold, cough and fevers.
<i>Dicoma tomentosa</i> Cass.	Barham booti,	Asteraceae	Whole plant	The plant is bitter, febrifuge. Locally applied on putrescent wounds.
<i>Ficus religiosa</i> Linn.	Peepal	Moraceae	Shoots, bark, seeds	The young shoots are used as purgative and have some reputation in skin diseases. The bark of this plant is used as tonic in decoction. The seeds are given in electuary as a purifier of the blood.
<i>Grantia aucheri</i>	Kolmir	Asteraceae	Whole plant	It is an annual herb found commonly in this area. Its decoction is externally applied to the snake and scorpion bite.
<i>Heliotropium brevifolium</i> Wall.	Kharsun	Boraginaceae	Whole plant	The plant is laxative and diuretic. The juice is used as an application to sore eyes, gum boils and sores generally to promote suppuration and as a cure for the sting of nettles and insects.
<i>Indigofera oblongifolia</i> Forsk.	Jhil	Papilionaceae	Roots, aerial parts	The plant has antisyphilitic and antiphlogistic properties. Root decoction is used as a purgative. Stem decoction is recommended fomentation of rheumatic joints and as a gargle in mercurial salivation.
<i>Kickxia ramosissima</i> (wall.)Jan.	Ghorawal, Kanodi	Scrophulariaceae	Whole plant	The herb is dried under shade and powdered which is recommended as anti-diabetic.
<i>Moringa oleifera</i> Lam.	Moa, Sohanjna	Moringaceae	Bark, fruit, gum, roots, seeds	The bark is abortive, fruit is stimulant and aphrodisiac. It is used in diseases of liver and spleen, articular aims, tetanus and paralysis. Gum is used for dental caries and earache in mixture with sesamum oil. The fresh roots are vesicant and rubefacient and useful in rheumatism. Used internally, the fresh juice of the roots has stimulant and diuretic properties and the roots in decoction furnishes a gargle. The seeds yield fine oil useful in rheumatism, and the tree gum is used as an anodyne in headache and as an application to buboes.
<i>Nerium oleander</i> L.	Johor, Knair	Apocynaceae	Whole plant	All parts of the plant are poisonous and are used in native practice for leprosy, cutaneous affections, and as an anthelmintic. The bark in paste is used in ringworm and itch and a decoction of the leaves externally as vermifuge.

<i>Periploca aphylla</i> Decne.	Nar khip	Asclepiadaceae	Bark	Bark decoction is purgative. Milky juice is locally applied to tumors and swellings. Plant is said to be useful in cerebral fevers and as stomachic.
<i>Plantago ovata</i> Forsk.	Ispagol	Plantaginaceae	Seeds	Seeds are cooling, diuretic, and demulcent, used in inflammatory conditions of mucous membrane, chronic dysentery, diarrhea and constipation.
<i>Rhazia stricta</i> Dene.	Shinhar, Sahaer	Apocynaceae	Leaves, fruit	Leaves are bitter and tonic; juice is given in skin eruptions, boils, sore throat, low fever and general debility. Fruits and leaves are considered useful against boils and eruptions. Leaves are said to have anticancer properties.
<i>Ricinus communis</i> Linn.	Arind, Handolo	Euphorbiaceae	Whole plant	This well-known plant yields the medicinal oil used as a purgative.
<i>Salvadora oleoides</i> Decne.	Jarh, Jhal	Salvadoraceae	Leaves, fruit, root bark	Leaves are purgative and are used to cure cough. Fruit is aphrodisiac. Root bark is vesicant. Oil from seed is applied on painful rheumatism and after childbirth.
<i>Solanum nigrum</i> L.	Kanwal, Karmachu, Mako	Solanaceae	Whole plant	Plant is sedative, diaphoretic, diuretic, alterative, expectorant, tonic and laxative. Leaves are used as poultice over rheumatic and gouty joint and in skin diseases. Berries recommended in dropsy, heart diseases, piles, gonorrhoea, spleen and liver enlargement of and hydrophobia.
<i>Solanum surattense</i> Bumr. f.	Kandiario	Solanaceae	Whole plant	Plant is bitter in taste, digestive, alterative, astringent, expectorant, aperient, diuretic and anthelmintic, used in cough, asthma, fever, chest pain. Juice of berry is useful in sore throat; leaves are applied locally to relieve pain.
<i>Tribulus longipetalus</i> Viv.	Gohind, Bhakra	Zygophyllaceae	Fruit, seeds	It is an annual procumbent herb found in sandy plains and mountain bases of this area. The fruit is diuretic, tonic, pain killer and used for cold and heart diseases. The seed hairs are diuretic and are taken for hemorrhages and diseases of bladder.
<i>Tribulus terrestris</i> L.	Gokhro, Gohind	Zygophyllaceae	Seeds	It is hairy, prostrate, annual or perennial herb. It has cooling, diuretic and tonic properties. The seeds are also recommended in hemorrhages and bladder diseases.
<i>Trichodesma indica</i> R. Br.	Gaozban	Boraginaceae	Leaves	The natives consider it to be an antidote in snake bites, the leaves are used as a poultice and in cold infusion as a blood purifier.
<i>Withania coagulans</i> Dunal.	Kapoi, Paneer	Solanaceae	Roots, leaves, fruit	Root and leaves are used as a coagulant. Fruits are alternative, sedative, emetic, diuretic and anodyne. Used in chronic liver complaints. Dried fruits are used in dyspepsia, intestinal infections, flatulent, colic.
<i>Withania somnifera</i> Dunal.	Asgand	Solanaceae	Leaves, fruits, roots	Leaves are bitter, infusion, given in fever. Bruised leaves and fruits are locally applied to tumors and tubercular glands, carbuncle, ulcers. Root is used in rheumatism, dyspepsia, and lumbar pains and for producing abortion. It is also aphrodisiac, alternative, narcotic and de-obstruent. Fruits are diuretic. Tubers are used in inflammatory conditions, psoriasis, bronchitis, ulcer and scabies. Seeds are diuretic and hypnotic, used to coagulate milk.

CONCLUSION

This study will generate wide interest about conservation of medicinal flora of the region, its sustainable uses and preservation of folk knowledge. This work will help greatly about local knowledge of people regarding the medicinal use of plants and will help to understand that how local people of Kirthar national park make use of these plant for the cure of different ailments and the indigenous names of plants provided by local inhabitants will help to study and understand the plants of this area for future studies. This paper contains evidence regarding medicinal plants and their use and it will ultimately aid to diversify the use of medicinal plants. By varying trends of medicinal use and by the death of old people, knowledge related to medicinal plants is going towards extinction and this effort will surely help to safeguard the folk knowledge of tibb prevailing in this area will act as reference for future studies in this regard.

ACKNOWLEDGMENT

We are also grateful to Dr. M.I Sultani, (Program leader) Range Research Program (NARC), Park Road Islamabad and Dr. Muhammad Ibrar Shinwari (Assistant Professor) Department of Environmental Sciences, International Islamic

University, Islamabad who guided, encouraged, and enable us to carry out this task.

REFERENCES

- Gregoriev, P. 1997. Pakistan protected area system review and action plan. IUCN.
- Thornthwaite, C. W. 1948. An approach to a rational classification of climate. Geog. Rev. 38: 55-94.
- Ali, S.I. and M. Qaiser. 1986. A phytogeographical Analysis of Phanerogams of Pakistan and Kashmir. Proc. of Royle Soc. Edinburgh, 89B: 89-101
- Zohary, M. 1973. Geobotanical foundations of the Middle East. Stuttgart.
- Hooker, J. D. (1872-1890): Flora of British India. Vol. I- VII Reeve & Co. Ltd. Asjard, Kant.
- Stewart, R.R. (1972): An Annotated Catalogue of the Vascular Plants of Pakistan and Kashmir, Karachi.
- Nasir, E. and S.I. Ali. (Eds.). 1970-1979. *Flora of West Pakistan*. National Herbarium PARC, Islamabad and Department of botany University of Karachi, Pakistan pp.1-131
- Nasir, E. and S.I. Ali. (Eds.). 1980-1989. *Flora of Pakistan*. National Herbarium PARC, Islamabad and Department of botany University of Karachi, Pakistan pp.132-190.
- Ahmad, S.S. 2007. Medicinal Wild Plants from Lahore-Islamabad Motorway (M-2). Pak. J. Bot., 39(2): 355-375.
- Bokhari, M. H, and A. Dasti, (1989): Ecological Guidelines for Exploration of Natural Resources in Thal and Cholistan Sand dunes, Annual Report.
- Ali, S. I, (1973): Mimosaceae (Editors Nasir , E & S.I. Ali) Flora of Pakistan no. 36, Department of Botany, University of Karachi.

12. Ali, S. I, (1983):Asclepiadaceae (Editors Nasir , E & S.I. Ali) Flora of Pakistan no. 150: 1-65,Department of Botany, University of Karachi.
13. Ghafoor, A, (1974):Zygophyllaceae (Editors Nasir , E & S.I. Ali) Flora of Pakistan no. 76, Department of Botany, D.J Sind, Government Science College Karachi.
14. Qaiser, M, and S Nazimuddin,, (1981): Rhamnaceae (Editors Nasir , E & S.I. Ali) Flora of Pakistan no. 136, Department of Botany, University of Karachi.
15. Qureshi, S, (1972): Salvadoraceae (Editors Nasir, E & S.I. Ali) Flora of Pakistan no. 140, Department of Botany, University of Karachi.
16. Gray, R. 2000. The Wild and Exotic. US Airways Attache pp.79-83.
17. Wright, R.T. and B. J. Nebel. 2002. Environment Science, Eighth Edition, Prentice Hall pp. 567.
18. Choudhary, M.I., S. Shahnaz, S. Paranden, A. Khalid, S.A.M. Ayatollahi, R. Atta and M. Parandz. 2003. New triterpenoid alkaloid cholinesterase inhibitors from *Buxus hyrcana*. J. Nat. Prod. 66: 739-742.
19. Hazrat, A., J. Shah, M. Ali and I. Iqbal. 2007. Medicinal Value of Ranunculaceae Of Dir Valley. Pak. J. Bot., 39(4): 1037-1044.
20. Ibrar, M., F. Hussain, and A. Sultan. 2007. Ethnobotanical Studies on Plant Resources of Ranyal Hills, District Shangla, Pakistan. Pak. J. Bot., 39(2): 329-337.
21. Khan, S.W. and S. Khatoon. 2008. Ethnobotanical Studies on some Useful Herbs of Haramosh and Bugrote Valleys in Gilgit, Northern Areas of Pakistan. Pak. J. Bot., 40(1): 43-58.
22. Watt, J.M.M. and M.G. Breyer- Brandwijk. 1962. Medicinal and Poisonous Plants of Southern and Eastern, Africa pp. 738.
23. Enari, L. 1982. Poisonous Plants of Southern California. County of Los Angles. Department of Arboreta and Botanic Gardens Arcadia, California, USA pp. 146.
24. Spoerke, J. D. and S. Smolinske. 1990. Toxicity of Houseplants. CRC Press, Boca Raton, USA, pp. 65.
25. Filmer, A.K. 1997. Know Your Plants-Safe or Poisonous? California Poison Control System, USA, pp. 19.
26. Sharon M. 2001. Poisonous Plants. The Connecticut Agricultural Experiment Station, pp. 120.

Source of support: Nil, Conflict of interest: None Declared