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ETHNOTOXIC PROFILE OF POISONOUS PLANTS OF KAGHAN VALLEY WESTERN HIMALAYAS PAKISTAN

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ABSTRACT

Rich accessibility of medicinal plants in the study area provides low cost health care for various ailments to local communities. This research report survey was commenced with an aim to document ethnic knowledge regarding the use of folk herbal medicine for various diseases among the local communities of Kaghan Valley. Rapid Appraisal Approach (RAA), semi-structured interviews, personal observations, group discussion with local people and meetings with herbalist were accompanied to acquire ethnomedicinal information. The current study recorded 62 poisonous plants belonging to 60 genera and 36 families. Which was reported by 243 informants (87 females, 137 males and 19 herbal specialists) from research area. The major uses of poisonous plants recorded from area were fish poison, antilice, anthelmintic, abortifacient, antiseptic, purgative and larvicides. Family Solanaceae was the most frequently used family with 6 reported medicinal plants followed by Euphorbiaceae, Papilionaceae and Ranunculaceae (4 each). The major source of herbal medicines was wild herbs (67.74%) followed by wild shrubs (22.58%) and trees (9.67). In plant part used, the whole plant (40.32%) and leaves (25%) were most dominant followed by root (16.12%) and seeds (10 %). These results suggest further phytochemical studies to explore new biological compounds for future drug discovery.

Key words: Folklore, poisonous plants, Chemical constituents, Kaghan Valley, Pakistan.

INTRODUCTION

Kaghan Valley is located in District Mansehra of Khyber Pakhtunkhawa Province (KPK), Northern Pakistan. The Kunhar river catchments area is commonly known as, "Kaghan Valley". It is 161 Km long scenic wonderlands. It is situated between 34^0-17/ to 35^0-10/ North latitudes and 73^0-28/ to 74^0-7/ East longitudes. Total area of the valley is about 1627 Sq. Km (Hussain, 2004). The Gujars, Swatis and Syeds are the major ethnic groups of the area. Gujars community is the most traditional ethnic group and mostly nomads. The people of Kaghan Valley are mostly poverty stricken and depend on forest resources for fuel wood, fodder, timber and medicinal plants. Pakistan is equally rich in population of poisonous plants but official record shows very less and unsatisfactory records about the use of these plants to poison animals or insects. Other plants poisonous to humans and livestock are not given due attention. Valuable but scattered information on a number of poisonous plants has been mentioned in several historical and mythological literatures (Jain, 1965 and 1991; Jain and Rao, 1976; Kirtikar, 2003; Saini, 2004; Desai and Patel, 2012; Umadevi *et al.,* 2013). In Pakistan, very little attention has been given towards the research on poisonous plants viz: (Baquar 1989; Sardar *et al.,* 2009; Qamar *et al.,* 2011; Alam *et al.,*2011; Khan *et al.,*2012). No considerable work has been done in the field of ethnobotany of poisonous plants.

There is an urgent need to take advantage of the extensive knowledge of different ethnic groups on poisonous plants for scientific scrutiny and adoption for posterity. Keeping this in view, the authors have made an attempt to survey Kaghan Valley, with an aim to study the poisonous plant resources being utilized by various tribes in multiple purposes for the preparation of herbal products.

MATERIALS AND METHODS

This fieldwork was undertaken in Kaghan Valley Northern Pakistan with the aid of the 25 communities. A total of 243 informants (87 females, 137 males and 19 herbal specialists with a different age groups were randomly selected for interviews in the local language. Prior Informant's Consent (PIC) was obtained in written on a questionnaire designed for ethnomedicinal knowledge documentation. Further, confirmation of reported information was made through the Participatory Rural Appraisal (PRA) method involving local inhabitants through interviews, group discussions and administration of semi-structured questionnaires to herbalists following Martins (1995); Cotton (1996); Bruni *et al.* (1997); Ghorbani *et al.,* (2011); Jamal *et al.,* (2012); Mahmood *et al.,* (2013). Data collected for each plant comprise the local name, parts used, preparation, application and administration route.

This survey was carried out from March 2012 to March 2013 following the protocols for ethno-botanical data documentation (Alexiades, 1996; Martin, 2004). Main target sites were Balakot, Paris, Shogran, Kaghan, Naran, Lalazar, Gittidas and Babusar. All the men informants were interviewed in the field; Hujras (male meeting places) while women informants were interviewed at their houses. Few herbalists (local healers) were also interviewed to assert the current status of folk knowledge in the study area.

The specimens were collected, identified and preserved by standard herbarium techniques and deposited in Herbarium of Pakistan (ISL), Department of Plant Sciences; Quaid-i-Azam University Islamabad.

RESULTS

Sixty two poisonous plant species belonging to 60 genera and 36 families were reported from the area, being utilized by various ethnic groups of the study area**.**

Enumeration: *Aconitum heterophyllum* Linn. Ranunculaceae, VN: Patris, PU: Roots. Chemical constituents: The alkaloids, aconitine, atisine, heterophyllisine, histisine occur in all parts of the plant, especially the root and seeds. (Prajapati *et al.*,2003)
Folklore: Roots are used as narcotic.
V. No: SK/KV/009

1. ***Ainsliaea aptera* DC.** Asteraceae, PU: Roots. Chemical constituents: No information is available.

Folklore: Root is used as wormicide.
V. No: SK/KV/002

2. ***Albizzia chinensis* (Osbeck) Merr.** Mimosaceae, VN: Shirin, PU: Seeds and Bark. Chemical constituents: Ascorbic acid, leucocyanidin and *B*-cytosterol (Prajapati *et al*., 2003).

Folklore: Seeds are used as fish poison. The aqueous extract of bark is used against conception in women.
V. No: SK/KV/003

3. ***Amaranthus viridis* Linn.** Amaranthaceae, VN: Ganiar, PU: Roots. Chemical constituents: Amarinthin, isoamarnathin, tryptophan and betanin(Haq and Hussain, 1993).

Folklore: Young roots pounded and mixed with water and sugar are given to pregnant women to induce abortion
V. No: SK/KV/001

4. ***Anagalis arvensis* Linn.** Primulaceae, VN: Binbatori, PU: Whole plant. Chemical constituents: Glycosidic saponins and cyclamin (Prajapati *et al.*, 2003).

Folklore: The plant is used as fish poison.
V. No: SK/KV/004

5. ***Andrachne cordifolia* (Dene.) Muell.** Euphorbiaceae VN: Kurkan, PU: Leaves. Chemical constituents: Not reported.

Folklore: This bush causes death of animals especially goats if eaten in large amount**.** It is emetic and purgative in its action and may cause nervous symptoms and convulsions. The body of animal swells up. Leaves are crushed and used as fish poison and also used to poison animals.
V. No: SK/KV/0010

6. ***Argemone mexicana* Linn.** Papaveraceae: VN: Kandiari, PU: Seeds and root. Chemical constituents: Allocryptopine, berberine, cheilanthifoline, norchelerythrine and methohydroxide (Prajapati *et al.*, 2003).

Folklore: Seeds oil is used to induce diarrhoea. The root is used as anthelmintic.
V. No: SK/KV/005

7. ***Arisaema flavum* (Forsskal) Schott.** Araceae, VN: Sur Ganda, Sap Makai. PU: Tuber. Chemical constituents: Saponins and diacylglyceryl galactosides (Prajapati *et al*., 2003).

Folklore: Large doses are purgative.
V. No: SK/KV/006

8. ***Aristolochia bracteolata* Lamk.** Aristolochiaceae, PU: Leaves and root. Chemical constituents: Aristolochic acid, and magnoflorine.(Khare, 2007.)

Folklore: Leavesare used as purgative. Poultice of roots is used on open wounds and skin ulcers.
V. No: SK/KV/007

9. ***Artemisia vulgaris* Linn.** Asteraceae, VN: Chau, PU: Whole plant. Chemical constituents: Santonin, tetradecatrilin, tricosanol, adenine and choline (Prajapati *et al.*, 2003).

Folklore: Whole plant is used as fish poison. Plant is also used in veterinary medicines as anthelmintic.
V. No: SK/KV/008.

10. ***Atropa acuminata* Royle.** Solanaceae, VN: Cheela Lubar, Tambaco Saag. PU: Whole plant. Chemical constituents: The alkaloid, hyoscyamine, occurs in all parts of the plant, especially in seeds, roots and leaves. Atropine has also been found in the roots. Choline, succinic acid, flavonoida, tannins, B-sistosterol nonacosane, ascorbic acid and dehydroascorbic acid (Prajapati, *et al.*, 2003).

Folklore: It is considered sedative and narcotic.
V. No: SK/KV/0011

11. ***Boerhavia diffusa* Linn.** Nyctaginaceae, VN: Itsit, PU: Whole plant. Chemical constituents: Triacontanol hentriacontane, B-sitosterol, ursolic acid, 5, 7-dihydroxy-3, 4-dimethoxy-6, and 8-dimethyl (Prajapati *et al.*, 2003).

Folklore: The roots are purgative and anthelmintic. Poultice of herb mixed with mustard oil is applied to boils.
V. No: SK/KV/0012

12. *Buddleja asiatica* Lour. Buddlejaceae, VN: Chitti Bui, PU: Leaves. Chemical constituents: Information is not available.
Folklore: Dried leaves are applied on the body of animals to prevent mites. Young branches and leaves are also used as fish poison.
V. No: SK/KV/0013

13. *Butea monosperma* (Lam.) Taub. Papilionaceae, VN: Kandiari PU: Seeds. Chemical constituents: Flowers contain butin and its 7-glucoside and 3-*B*-D glucoside. Gum from bark contains leucocyanidin. Seeds contain palasinin, aleuritic acid, jalaric acid, laccijalaric acid, cantharic n-heneicosanic acid and monospermin (Kaushik and Dhiman 1999;Prajapati*et al.*, 2003; Khare, 2007.)
Folklore: Seeds are used to expel worms from stomach. Seeds powder is used to expel larvae from ulcers.
V. No: SK/KV/0014

14. *Buxus sempervirens* Hk. f. Buxaceae, VN: Shamshad, PU: Leaves. Chemical constituents: No information is available.
Folklore: Plant is used to induce diarrhoea.
V. No: SK/KV/0015

15. *Caltha palustris* Linn. Ranunculaceae, VN: Mameera, PU: Whole plant. Chemical constituents: Helleborin, veratin and protoanemonin(Prajapati *et al*., 2003).
Folklore: Possess very acrid properties which usually lead animals to avoid it. However, eating the fresh tops has poisoned cattle, sheep and horses. According to locals the dried plant is harmless. It is used as febrifuge.
V. No: SK/KV/0017

16. *Cannabis sativa* Linn. Cannabinaceae, VN: Bhang, PU: Leaves. Chemical constituents: Tetrahydrocannabinol, cannabidiol, cannabichromene, cannabicitran, cannabicyclol, cannabigerol, cannabinodiol, and cannabitetrol (Haq and Hussain, 1993; Kaushik and Dhiman, 1999; Prajapati *et al*., 2003; Khare, 2007).
Folklore: The drugs addicts who smoke them in cigarettes or in pipe. They use the dried leaves bracts. The narcotic may cause death because of its depressing effect upon the heart beat. Chars is used for soothing and narcotic activities.
V. No: SK/KV/0016

17. *Carissa opaca* Stapf. Ex Haines. Apocynaceae, VN: Garanda, PU: Fruits and roots. Chemical constituents: Carissone, carindone, carinol and four crystalline substances, viz: A, B, a cardioactive and B-Sitosterol, Caffeic acid, odoroside B,C,G and H and evomonoside (Prajapati *et al.*, 2003; Khare, 2007).
Folklore: Fruits are purgative. Grounded root is put in worm infested sores of animals.
V. No: SK/KV/0018

18. *Catharanthus roseus* Linn. Apocynaceae, VN: Sadabahar, PU: Leaves. Chemical constituents: The leaves contain alkaloids serpentine, ajmalline, ajmalicine, caranthine, vindoline, vindolinine, vincaleucoblastine, leurosidine and vincristine(Kaushik and Dhiman, 1999; Prajapati *et al.*, 2003; Khare, 2007).
Folklore: Whole plant is poisonous, used to remove maggots from ulcers in animals.
V. No: SK/KV/0019

19. *Chenopodium ambrosioides* Linn. Chenopodiaceae, VN: Bathwa. PU: Whole plant. Chemical constituents: Seeds contain a volatile oil and triterpenoid saponins. Ascaridol, quercetin, kaempferol and saponin (Kaushik and Dhiman, 1999; Prajapati *et al*., 2003; Khare, 2007).
Folklore: Leaves and seeds with sugar are given to expel intestinal worms in animals.
V. No: SK/KV/0020

20. *Convolvulus arvensis* Linn. Convolvulaceae, VN: Ilri, PU: Whole plant. Chemical constituents: Contains resin convolvulin, beta-Me-esculetin, n-alkanes, n- alkanols (Haq and Hussain, 1993; Khare, 2007).
Folklore: Roots are used as purgative. For pinworms leaves along with fruit are used.
V. No: SK/KV/0021

21. *Cronopus didymus* Linn. Cruciferae, PU: Whole plant. Chemical constituents: No information is available.
Folklore: Paste of the plant is used to remove maggots from wounds in animals.
V. No: SK/KV/0022

22. *Conium maculatum* Linn. Umbelliferae, PU: Whole plant. Chemical constituents: Main alkaloid is coniine and a volatile oil. Coniine is extremelytoxic and causes congenital deformities. Gamma-coniceine, N- methylconiine, diosmin, chlorogenic acid (Prajapati *et al.*, 2003; Khare, 2007).
Folklore: The plant seems to be the most poisonous to livestock in the spring when the herbage is fresh. Used as a poison to kill human being and animals by enemies.
V. No: SK/KV/0023

23. *Cuscuta reflexa* Roxb. Cuscutaceae, VN: Neela dhari, PU: Whole plant. Chemical constituents: The

seeds have cuscutin, cerotic, linolenic, linolic, oleic, stearic and palmitic acid, quercetin, hyperoside, amerbelin (Baquar, 1989; Haq and Hussain, 1993; Prajapati *et al.,* 2003; Khare, 2007).

Folklore: Whole plant is used as fish poison. The powdered seeds are used as antifertility drugs.

V. No: SK/KV/0024

24. ***Cyperus rotundus*** **Linn.** Cyperaceae, VN: Muthar PU: Tuberous roots. Chemical constituents: The tubers contain essential oil which consist of pinene, traces of cineole, sesquiterpenes, *B*-Sistosterol and iso-cyperol, cyperene, cyperol (Prajapati *et al.,* 2003; Kaushik and Dhiman, 1999; Khare, 2007).

Folklore: Tuber is crushed with water and taken orally to expel intestinal worms.

V. No: SK/KV/0025

25. ***Datura strumarium*** **Linn.** Solanaceae, VN: Datura, PU: Whole plant. Chemical constituents: The seeds contain atropine, Hyoscine, eicosanoic, linoleic and oleic acids. Leaves contain chlorogenic acid, and datugenin, cuscohygrine, scopolamine and tropine, cumarins and tannins. Flowers contain hyocyamine, dautratataturin, and skimmianine (Haq and Hussain, 1993; Prajapati *et al*., 2003; Khare, 2007).

Folklore: A decoction of flowers has been used as a sedative to calm the patients. Whole plant is also used as antiseptic. Also used to poison animals.

V. No: SK/KV/0026

26. ***Delphinium vestitum*** **Wallich ex Royle.** Ranunculaceae, PU: Roots. Chemical constituents: Roots contain delphinine, delphisine, delphinodien, staphisangarine and a resin (Khare, 2007).

Folklore: Roots are used to cure toothache.

V. No: SK/KV/0027

27. ***Digitalis purpurea*** **Linn.** Scrophulariaceae, VN: Barg- e- Lafah, PU: Leaves. Chemical constituents: Contain cardiac glucosides, anthraquinones, flavonoida and saponins. Digitoxin rapidly strengthens the heartbeat (Prajapati *et al*., 2003; Baquar, 1989).

Folklore: This is used to make ointments for application on wounds and burns.

V. No: SK/KV/0028

28. ***Echinops ehcinatus*** **Roxb.** Asteraceae, VN: Kandiari, PU: Roots. Chemical constituents: The plant contains hentriacontane, hentriacontanol, B-amyrin, and lupeol. Besides seeds are reported to contain echinopsine (Khare, 2007).

Folklore: The powdered root mixed with water is applied to hair to kill lice's.

V. No: SK/KV/0029

29. ***Euphorbia pilosa*** **Linn.** Euphorbiaceae, VN: Dodal, PU: Latex. Chemical constituents: The leaves and stem contain hentriacontane, *B*-Sitosterol, *B*-amyrin, friedelin, and taraxerol. Roots contain prostratin. Gum contain campesterol, stigmasterol, euphosterol and xanthorhamin (Khare, 2007).

Folklore: The latex of this plant possesses vesicant, wormicidal and purgative properties.

V. No: SK/KV/0030

30. ***Girardinia palmata*** **(Forsk) Gaud. Freye.** Urticaceae, VN: kair, Bichu booti, PU: Whole plant. Chemical constituents: No information is available.

Folklore: Like *Urtica* upon contact with the skin, produce an intense itching of short duration. Whole plant is crushed and used to stupefy fish.

V. No: SK/KV/0031

31. ***Hyocyamus niger*** **Linn.** Solanaceae, VN: Ajwain, PU: Whole plant. Chemical constituents: Alkaloids hyocyamine, Hyoscine and scopolamine (Khare, 2007; Prajapati *et al*., 2003; Baquar, 1989).

Folklore: All parts of the plant are poisonous but because of its unpleasant taste animal usually avoid it. Eating the seeds or seedpods has poisoned children. The seeds of this plant have medicinal properties; they are pasted and applied locally in pains.

V. No: SK/KV/0032

32. ***Hypericum perforatum*** **Linn.** Guttiferae, LN: Peeli booti, PU: Flowers. Chemical constituents: Volatile oil, hypericin, and pseudohypericin, flavonoids (Khare, 2007; Prajapati *et al.,* 2003; Baquar, 1989).

Folklore: Flowers are used as sedative.

V. No: SK/KV/0033

33. ***Hedera nepalensis*****K. Koch.** Araliaceae, VN: Arbambal, PU: Berries. Chemical constituents: Arsenic oxide, saponin, alpha-hedrin, helixin, D-gluciside, oleanic acid, nepalin (Khare, 2007; Prajapati *et al.,* 2003).

Folklore: The whole plant, especially the leaves and berries are poisonous. Berries are used as purgative.

V. No: SK/KV/0034

34. ***Ipomea hederacea*** **(Linn.) Jacq.** Convolvulaceae, VN: Ilri, PU: Whole plant. Chemical constituents: Contains resin convolvulin, lysergol, chanoclavine, penniclavine, elymoclavine (Khare, 2007).

Folklore: Seeds are purgative. The smoke of the plant is useful to keep away the mosquitoes.

V. No: SK/KV/0035

35. ***Lantana camara*** **Linn.** Verbenaceae, VN: Panjphulari. PU: Whole plant. Chemical constituents: Catalase, amylase, invertase, tannase, caryophyllene, and a steroid lancamarone, quinine like alkaloid lantanine (Prajapati *et al*., 2003; Khare, 2007).

Folklore: Powdered leaves are useful for cuts, wounds, ulcers and swellings.

V. No: SK/KV/0036

36. *Lathyrus aphca* Linn. Papilionaceae, VN: Jungli matter, PU: Seeds. Chemical constituents: No information is available.

Folklore: Ripe seeds are smoked as narcotic.

V. No: SK/KV/0037

37. *Mallotus philippinensis* (Lamk.) Muell. Euphorbiaceae, VN: Kambila, PU: Fruits. Chemical constituents: The fruits contain rottlerin, isorottlerin, kamalins I and II, and cinnamoylchromene and flavone chromene. The leaves contain phorbic acid, tannins, and protein. The bark contains *B*-sitosterol and berganin (Prajapati *et al*., 2003; Khare, 2007).

Folklore: The crude powder from the exterior of the fruits is mixed with candy or sugar and used as anthelmintic. This is used to destroy thread worms, hook worms and round worms.

V. No: SK/KV/0038

38. *Melia azedarach* Linn. Meliaceae, VN: Derek, PU: Leaves and fruit. Chemical constituents: Leaves are reported to contain nimbiene, meliacin andquercitin. The fruits contain azaridine, bakayanin, bakalactone, margosine, azadirone, azadiradione, epoxyazadiradione and ohchinol (Haq and Hussain, 1993; Prajapati *et al.,* 2003; Khare, 2007).

Folklore: Leaves are used as purgative. Decoction of fruits is used to kill lice's.

V. No: SK/KV/0039

39. *Melilotus alba* Desv. Papilionaceae, VN: Sinji, PU: Whole plant. Chemical constituents: Melilots contain flavonoids, coumarins, resin, tannins and volatile oil. If allowed to spoil, the plant produces dicoumarol, a powerful anticoagulant (Haq and Hussain, 1993; Prajapati *et al.,* 2003; Khare, 2007).

Folklore: The plant is mildly sedative.

V. No: SK/KV/0040

40. *Nerium indicum* Miller. Apocynaceae, VN: Kaner. PU: Whole plant. Chemical constituents: Roots, bark and seeds contain cardio-active glycosides, formerly designated as neriodorin, and karabin, pregnanolone, cardenolide glysocide (Prajapati *et al.,* 2003; Khare, 2007).

Folklore: The leaves are lightly toxic both in the green and dry condition. The plant is used as rat poison. A decoction of leaves is used to destroy maggots infesting wounds.

V. No: SK/KV/0041

41. *Nicotiana tabacum* Linn. Solanaceae, VN: Tambaku, PU: Leaves. Chemical constituents: Nicotine, nornicotine, anabasine, nicotyrine, nicotimine, piperidine, pyrrolidine, nicotoine and myosmine (Haq and Hussain, 1993; Prajapati *et al.,* 2003; Khare, 2007).

Folklore: The ill effect of this plant is well known. Leaves are used to kill lice's. Leaves are also smoked as narcotics.

V. No: SK/KV/0042

42. *Physalis minima* Linn. Solanaceae,VN: Pataki, PU: Berries. Chemical constituents: Quercetin, with a steroides, physalindicanols, withaminimin and withaphysalin (Khare, 2007)

Folklore: Berries are used as purgative.

V. No: SK/KV/0043

43. *Phytolacca latbenia* (Moq.) Walter. Phytolaccaceae, VN: Lubar, PU: Whole plant. Chemical constituents: Phytolaccine, betanidine, isobetanine, isopyrebetanine and phytolaccagenic acid (Prajapati*et al.,* 2003).

Folklore: Herb is used as narcotic.

V. No: SK/KV/0044

44. *Papaver somniferum* Linn. Papaveraceae, VN: Posut/Doda, PU: Latex from capsule. Chemical constituents: The latex is rich in alkaloids; morphine, codeine, thebaine, nacrocotine, narceine, and papaverine (Prajapati *et al.,* 2003. Khare, 2007).

Folklore: The capsules from which latex has been drawn off are used as narcotic, analgesic and sedative.

V. No: SK/KV/0045

45. *Podophyllum hexandrum* Wall. ex Royle. Podophyllaceae, VN: Bankakri, PU: Whole plant. Chemical constituents: Podophyllin, podophyllotoxin, quercitin and *B*-peltatin (Prajapati *et al*., 2003; Khare, 2007).

Folklore: The drug is used as a purgative, overdoses of which may prove fatal.

V. No: SK/KV/0046

46. *Polygonum capitatum* Buch. Ham. ex D. Don. Polygonaceae VN: Marchari PU: Whole plant. Chemical constituents: Not reported.

Folklore: Whole plant is used as fish poison.

V. No: SK/KV/0047

47. *Polygonum hydropiper* Linn. Polygonaceae, VN: Marchari, PU: Whole plant. Chemical constituents: Quercetin, kaempferol, isorhamnetin, rhamnesin (Khare, 2007).

Folklore: Whole plant is crushed and thrown in pond water to stupefy fish.

V. No: SK/KV/0048

48. *Polygonum persicaria* Linn. Polygonaceae, VN: Marchari, PU: Whole plant. Chemical constituent: Not reported in published literature

Folklore: Whole plant is crushed and thrown in pond water to stupefy fish.

V. No: SK/KV/0049

49. *Rabdosia rugosa* (Wall ex Benth.) Hara Lamiaceae, VN: Bui PU: Leaves and flowers. Chemical constituents: Information not available.

Folklore: Leaves and flowers are used to repel mosquitoes and mites.

V. No: SK/KV/0050

50. *Rananculus scleratus* Linn. Ranunculaceae, VN: Chachumba, PU: Leaves. Chemical constituents: The plant contains anemomin, ranunculine, serotonin and six other tryptamines (Prajapati *et al.,* 2003; Khare, 2007).

Folklore: The bruised leaves are used to raise blisters and may be used to keep open sores caused by vesication.

V. No: SK/KV/0051

51. *Riccinus communis* Linn. Euphorbiaceae, VN: Arand, PU: Seeds and oil. Chemical constituents: Ricinine, carrageenan, bradykinin, N-Demethylricinine, ricinins (Haq and Hussain, 1993; Prajapati *et al.*, 2003; Khare, 2007).

Folklore: Seeds are highly purgative and cause diarrhoea. The people take the oil to induce diarrhoea. Oil is also given to pregnant women to ease delivery, over dose may induce abortion.

V. No: SK/KV/009

52. *Robinia pseudacacia* Linn. Papilionaceae, VN: Kikar PU: Flowers. Chemical constituents: Robinin, l- asparagine (Khare, 2007).

Folklore: Flowers are used to induce vomiting.

V. No: SK/KV/0053

53. *Sapindus laurifolia* Vahl. Sapindaceae, VN: Raitha, PU: Fruit. Chemical constituents: Saponins; nuts contain kaempferol, quercitin, and B-sitosterol, genins (Prajapati *et al*., 2003; Khare, 2007).

Folklore: Fruit coat is used as antilice and fish poison. Decoction of the bark is good for cattle suffering from ulcers due to worm infestation after calving.

V. No SK/KV/0054

54. *Solanum nigrum* Linn. Solanaceae, VN: Kachmach, PU: Whole plant. Chemical constituents: Leaf is a rich resource of riboflavin, nicotinic acid and vitamin 'C'. The immature green fruit of the plant contain steroidal glycol-alkaloids viz. solamargine, and A and B solamargine and all of them yield solasodine as the glycone, solasonine, tigogenin (Haq and Hussain, 1993; Prajapati *et al.,* 2003; Khare, 2007).

Folklore: The leaves and berries of the black nightshade, especially in the unripe condition, are poisonous. The leaves are cooked as vegetable and used as anthelmintic.

V. No: SK/KV/0055

55. *Scrophulaia koelzii* Pennel. Scrophulariaceae, PU: Whole plant. Chemical constituents: Contains iridoids, flavonoids, tannins, and phenolic acids(Haq and Hussain, 1993; Prajapati *et al.,* 2003).

Folklore: The herb is mildly diuretic and is reputed to be effective when used to expel worms.

V. No: SK/KV/0056

56. *Taxus wallichiana* Zucc. Taxaceae, VN: Barmi, PU: Whole plant. Chemical constituents: Contains paclitaxel, taxine A and B, taxicatin, milossine, and ephedrine. Ginkgetin, sciadopitysin (Prajapati *et al.*, 2003; Khare, 2007)

Folklore: The leaves are used to induce menstruation and abortion.

V. No: SK/KV/0057

57. *Tribulus terrestris* Linn. Zygophyllaceae, VN: Gokhru, PU: Leaves. Chemical constituents: The plant contains saponins, diosgenin, gitogenin, chlorogenin, and ruscogenin and flvonoid triboloside. Kaempferol (Prajapati *et al.,* 2003; Khare, 2007).

Folklore: The leaves are used to induce menstruation and abortion.

V. No: SK/KV/0058

58. *Urtica dioica* Linn. Urticaceae, LN: Bichu booti PU: Leaves. Chemical constituents: Contain acid amines, flavonoids, choline and acetyl transferase, phenol (Prajapati *et al.,* 2003; Khare, 2007).

Folklore: Leaves are eaten as purgative and also eaten to ease delivery and also abortion.

V. No: SK/KV/0059

59. *Vitex negundo* Linn. Verbenaceae, VN: Marvani, PU: Leaves. Chemical constituents: Leaves contain two alkaloids nishindine, and hydrocotyline. Fresh leaves yield pale greenish yellow oil. Luteolin, casticin (Haq and Hussain, 1993;Prajapati*et al.*, 2003; Khare, 2007).

Folklore: Powdered leaves are used as insect repellent. Fresh leaves extract solution is sprayed in the crops to kill insects and pests. Leaves are also given to animals to remove maggots from ulcers.

V. No: SK/KV/0060

60. *Xanthium strumarium* Linn. Asteraceae VN: Kandiari, PU: Leaves. Chemical constituents: Plantcontains alkaloids sesquiterpine and lactone-xanthinin, solstitialin, stizolicin (Prajapati *et al.*, 2003; Khare, 2007).

Folklore: Leaves are used to stop bleeding from wounds and also to expel maggots in animals.

V. No: SK/KV/ 0061

61. *Zanthoxylum armatum* Roxb. Rutaceae VN: Timbar, PU: Seeds, fruit. Chemical constituents: Seeds contain pyranocoumarins, such as xanthoxyletin, isoquinoline; alkaloids including berberine and N-methyl-isocortdin. Skimmianin,

dictamine, thoplanine, magnoflorine, pipevine (Haq and Hussain, 1993; Prajapati *et al.*, 2003; Khare, 2007) .

Folklore: Seeds are crushed and thrown in water and used as fish poison.

V. No: SK/KV/0062

Key: VN: Vernacular name, Fl and Frts: Flowering and Fruiting, PU: Part used, V. No: Voucher number.

DISCUSSION

The poisonous properties of plants are due to the presence of certain toxic constituents which include alkaloids, fixed oils, glycosoides, saponins, bitter principles, toxic proteins, essential chemical oils, resins, organic acids, tannins, and other toxic compounds. According to the nature of these compounds, and how they occur in different plants, they produce varieties of toxic effects. Some of them cause deadly poisonous effect to humans, livestock, insects, pests and maggots while other produce colic, vomiting, dehydration, diarrhoea, dermatitis, blistering, violent irritation etc. Kaghan Valley has not been explored before for poisonous plants and their traditional uses. There are more than 300 medicinal and poisonous plants reported from the area. The present study reveals that that a large number of plants found in Kaghan Valley, commonly known for its injurious and harmful properties have been utilized for varieties of beneficial purposes by local community. There were about 62 poisonous plant species belonging to 60genera and 36families reported from the area, being utilized for various advantageous and disadvantageous purposes by ethnic groups and rural people. During the survey of the area, it has also been observed that some ancient methods are still used for catching fish and hunting of animals to meet their food requirement. About 10 species were used as fish poison by resident of this region to procure food from animal resources.

The inhabitants of this area also rear cows, goats and sheep and they use several plants for the treatment of various animal diseases. Ten species were used as larvicides to expel or remove maggots from the wounds and ulcers in animals. The aggregation of parasitic insects such as lices was also very much common in animals and humans. To get rid of these insects, about four plant species were used as bath or spray on the body and hair. To expel intestinal worms about 12 species were used as anthelmintic or wormicide to kill worms from the intestines and stomachs of humans and animals. There were about three species used in criminal practices. Killing of men and women with poisoning was due to jealously. Killing of mad and stray dogs and other dangerous animals are also rarely and occasionally occurring in the area. Birth control and abortion is not very much common, still 6 species were used as abortifacient to abort premature pregnancy and to induce menstruation. The use of narcotics was a common factor of rural community. The local community used about 11 species as narcotics and sedative. Treatment of constipation through plants was very popular among the local community. About 10 species were used as purgative and to induce vomiting, but sometime high doses may cause diarrhoea and dehydration ultimately leading to death. About eight harmful plants containing spines, stinging hairs and pointed seeds have also been recorded from the area which by mechanical or chemical action produces subcutaneous abscesses, blisters, dermatitis and itching sensation in humans and livestock.

Thus, it was evident, that a large number of plants used to kill, remove or repel insects, pests, worms and other animals were completely harmless to men. These plants may be utilized to prepare new bio-pesticides, bio-insecticides, and bio-wormicides. These bio drugs would not only be cheap products in comparison to chemical pesticides, but also biodegradable, hence, eliminating the chances of pollution hazards. There is also possibility to yield new wormicide after chemical and pharmacological investigations. Therefore, the herbal products prepared carefully from various poisonous plants for the treatment of various ailments and other beneficial purposes may play important role in the economy of rural societies as well as of the country, if properly studied and analyzed. It is therefore suggested that a detailed and systematic survey of poisonous plants in many more areas in the country should be done along with phytochemical and pharmacological studies for their positive exploitation and wider applications. The recent literature makes it evident that there is considerable gap in the knowledge of poisonous plants and more information on such plants are awaited. The potentiality of ethno-toxicological investigations on plants is perhaps more scintillating in the quest for new bio-drugs.

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