

Two Common Medicinal Plants of Pakistan And Their Pharmacological Activities: A Mini Review

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Abstract

Lots of today's synthetic medicines are created from the number of plants. A great deal of work has been done in the field of allopathic and herbal medicine, as reported by number of publications describing phytoconstituents in previous years as anti-tumor drugs, contraceptives drugs, anti-inflammatory, antioxidant drugs etc. A plant contains numerous chemical compounds, which work for different therapeutic purposes. Worldwide nearly one fourth of the prescribed drugs are originated from plants, 121 active chemical constituents of plants are currently in use. About 85,000 valuable medicinal plant species worldwide are reported. Pakistan is a rich country in terms of vegetation of medicinal and aromatic plants. Medicinal plants in Pakistan are used to treat different ailments, like hepatic diseases, cardiac problems, common disorders like fever, cough, diarrhea, cold etc. with less or no side effects. Purpose of present study is to deliver information on the therapeutic potentials of two common medicinal plants (*Cannabis sativa*, *Chenopodium album*) commonly used in traditional medicines in Pakistan. Both of these plants possess different biological activities and various therapeutic uses.

Keywords: Pakistan; Medicinal plants; Phytochemistry; *Cannabis sativa*; *Chenopodium album*

Introduction

Lots of today's synthetic medicines are created from the number of plants [1]. A great deal of work has been done in the field of allopathic and herbal medicine, as reported by number of publications describing phytoconstituents in previous years as anti-tumor drugs, contraceptives drugs, anti-inflammatory, antioxidant drugs etc [2]. According to the recent studies, in developing countries for major health related issues, maximum number of people relies on conventional physician. Along with the availability of modern medicines, herbal drugs are in use to a great extent [3]. A plant contains numerous chemical compounds, which work for different therapeutic purposes; although over-dosage of plant extracts may be toxic for human and animal bodies [4]. Worldwide nearly one fourth of the prescribed drugs are originated from plants, 121 active chemical constituents of plants are currently in use. Out of 252 majorly known medicines by the WHO, 11% are completely from plant kingdom. There are some significant medicines attained from plants are quinine and quinidine from *Cinchona* spp., digoxin from *Digitalis* spp., vinblastine and vincristine from *Catharanthus roseus*, morphine and codeine from *Papaver somniferum* and atropine from *Atropa belladonna*. [5]. How one can use herbs for the cure of ailments in the field of medicine is shown in Figure 1. Sensitive bioassays are required for the extracts of medicinal plant having low concentration of active compounds which are appropriate for the extensive range of biochemical constituents and for very minor quantities of the verified samples, experiments should be producible, quick, cheap and simple producible [6,7]. Spectroscopic techniques ultraviolet spectroscopy, infrared, mass spectrum or nuclear magnetic resonance are used for structure determination of the chemical constituents after it is purified [8]. Study of herbal plants has gained importance in terms of their traditional and therapeutic usage worldwide during the last few years.

Medicinal Plants of Pakistan

Around 85,000 important pharmacological herbs worldwide are reported [9,10]. Various medicines for major ailments are very expensive to use worldwide. Due to robust medicinal

importance of different plants globally a new trend is emerging to use natural products for cure. 80% world population depends on traditional system of medicine because of strong biological potential of plants; ethnobotany is main source to find medicinal herbs in developing countries [11,12]. Pakistan is an agricultural country with many class differences, various treatments are available for different diseases in Pakistan, and herbal remedies are effectively in practice especially in rural areas both for humans and livestock. The traditional medicines are cheaper, especially for those living in the rural areas with lower income. On the other hand, people living in the urban areas also consider these herbal treatments as their traditional use [13] (10 medicinal plants of Pakistan).

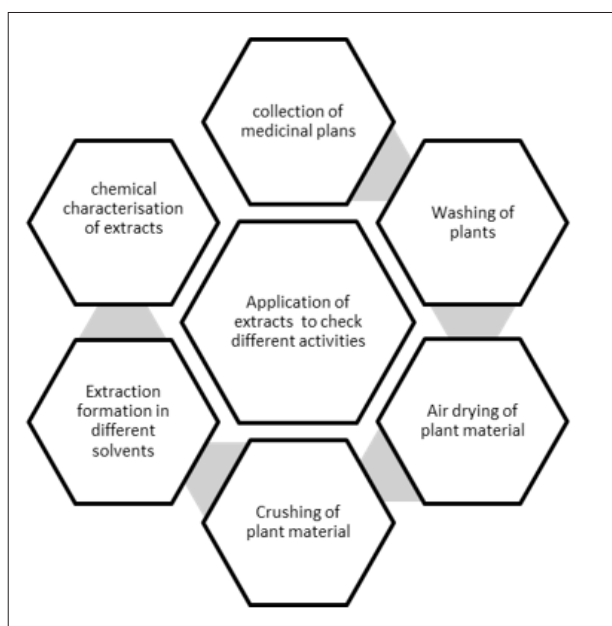


Figure 1: Flow chart showing the strategy of medicinal plants used in herbal medicines.

Pakistan is a rich country in terms of vegetation of medicinal and aromatic plants. Most of these plants are very well studied in terms of their properties and therapeutic use but many still have to be explored. Field of ethno-medicine in Pakistan is still not fully investigated, while 5700 species of medicinal plants are currently presently in Pakistan. About 372 species of plant are widely distributed, 456 herbal plant species are used to make more than 350 conventional formulations to cure number of diseases [14]. Like Hamdard laboratories there other few institutions which has done a great deal of scientific work to make effective and safe marketable product as herbal medicines for various ailments [13] (10 medicinal plants of Pakistan). Medicinal plants in Pakistan are used to treat different ailments, like hepatic diseases, cardiac problems, common disorders like fever, cough, diarrhea, cold etc with less or no side effects. The emphasis of present study is to deliver information on the therapeutic potential of two plants (*Cannabis sativa*, *Chenopodium album*) commonly used in traditional medicines in Pakistan. Both of these plants possess different biological activities and various therapeutic uses.

Cannabis sativa L. (Bhang)

It belongs to a family Cannabinaceae, flowering period is from April to October. Plants parts which are mostly used in herbal remedies are leaves and flowering tops. It is very common and mostly present in moist waste places. In folk medicine it is used in the form of hot or cold drink of dry powdered leaves due to sedative property. The plant is used as tonic and as a relaxing agent or sedative drug [15]. In general *cannabis* is an annual dioecious species having male and female plants. Male *cannabis* plant is short lived than female plant with maximum pollen production in end weeks of its life cycle. Female plant produces number of fertile seeds. Cannabinoid is a chemical constituent which is unique to this plant, along with terpenes it is present in all the upper portions of this herb but most of the cannabinoids are present in female flowers [16]. *Cannabis sativa* is a multi-purpose plant; it can be used to make medicine, fuel, food and fuel. For arthritis or joint pain root of *cannabis* is used as an old folk medicine [17]. In Argentina *cannabis sativa* is considered as a wonder drug for the treatment of tetanus, swelling of liver, colic people, sterility, abortion, asthma, gonorrhoea, tuberculosis of lungs, in spring season root-bark of the plant has been collected and used as anti-fever drug, tonic and to cure dysentery and gastralgia, either in powder form or in form of decoctions. Powdered form of root can be used for the treatment of burns to relieve the pain. For the treatment of cancer oil from the seeds has been frequently used [18]. Number of phytochemicals are present in plant e.g., sugars, flavonoids, hydrocarbons, terpenes, amino acids, nitrogen compounds and steroids. Out of all the phytoconstituents C_{21} terpenophenolic cannabinoids are unique to this plant [19]. Some of the 483 phytoconstituents are unique to *cannabis sativa*, e.g. more than 60 cannabinoids and 140 members of terpenes form the most abundant class are widely distributed in plant kingdom [20].

More than 25 diseases can be cured by leaves of *cannabis* [21]. Along with the medicinal importance *cannabis sativa* can also induce some mental disorders especially in youths [22,23]. It has been used as Anthelmintic [24], has anticancer activity against cancerous cell lines and also show antimicrobial activity [25,26], can be used as a parturifacient [27], as an abortifacient [28] can be used for inflammation [29], fresh leaves are mostly used for hemorrhoids [30], skin disorders are treated with external fruit use [31]. It is also used in various ayurvedic medicines in India [32]. Recent researches on cannabinoid receptors in the brain and body of humans and animals, which react pharmacologically to *Cannabis*, have discovered its uses in wide range of medicine. Due to its great medicinal importance further therapeutic research of *cannabis sativa* is warranted [33].

Chenopodium album L. (Bathueya, Batho)

Chenopodium album L. belongs to a family *chenopodiaceae*, its flowering period is from February to March. Whole plant is used in the field of herbal medicine. *C. album* is commonly present in garbage containing moist places. The use of this plant in folk medicine is as laxative and anthelmintic; used in hepatic ailments and enlarged spleen. The roots of *C. album* are used in hepatic diseases like jaundice, rheumatism and for urinary diseases. The

fruits and roots of the plant are recognized as an antitoxin to snake venom [14].

Chenopodium album L. is herbaceous plant commonly known as Bathua, used as food. It is cultivated herb grown in pots and gardens. It is green and reddish, upright, inodorous, stem is mostly striped, leaves are of different size and shape, completely annular embryo. The plant is used as appetizer. Traditionally the plant has laxative, anthelmintic, diuretic and aphrodisiac action. It is also used to treat various diseases like throat troubles, abdominal pains, piles, eye infections, blood, heart and spleen disorders and biliousness [34]. Leaves and seeds are the main medicinal organ of the plant. Leaves are rich in essential oil, a significant quantity of albuminoids, mineral matters, particularly in potash salts and other compounds are nitrogen [35], a phenolic amide and saponins has been isolated from the roots of *C. album* [36,37], sitosterol and oleanolic acid in flowers [38]. Hindu physicians suggested this plant for treatment of liver diseases and splenic enlargement [35]. It is found in areas around Mumbai, Kashmir, Sikkim and throughout Pakistan [39]. Phytochemical study shown the presence of alkaloids [40,41], apocarotenoids [42], flavonoids [43], phytoecdysteroids [44-46] and an unusual xyloside [47] in the plant. Different solvents like methanol, ethanol, chloroform, acetone, petroleum ether and benzene are used to extract these phytoconstituents [48].

Ethanollic and aqueous extract of the leaves of *C. album* were screened for their anticancer properties, both the extracts inhibited cell growth [49]. Aqueous and alcoholic extracts of aerial parts of *C. album* significantly restore physiological integrity of hepatocytes, when paracetamol and alcohol are used as hepatotoxins [50,51]. They also have spasmolytic and analgesic activity [39] and also show antiulcer activity [52]. Ethanolic leaf extracts of *C. album* were tested against both gram-positive and gram-negative bacteria in humans and yeasts, ethanolic, aqueous, and methanolic extracts show strongest action on numerous strains of gram-negative and gram positive bacteria [53,54]. Methanolic and ethanolic extracts of flowers and leaves of *C. album* do not show any antibacterial activity against different bacterial strains [55]. Essential oils present in the leaves of *Chenopodium album* also show anti-inflammatory activity in mice [56]. The pharmacological studies shown in this review shows the medicinal importance of widely distributed *Chenopodium album*, due to its great pharmacological activity it is worth to use this plant in future for number of medicines.

Conclusion

Herbal medicine system is in use for hundreds of years, plants are the main source of natural products in 60% of medicine now days. Plants have formed the basis of sophisticated traditional medicine systems that have been in existence for thousands of years and continue to provide mankind with new remedies. The pharmacological studies of *cannabis sativa* and *chenopodium album* reported in this review confirm their therapeutic value. Medicinal properties of these two common Pakistani plants are due to the presence of number of chemical constituents in plants. They show different biological activities against different diseases in humans and livestock. The present study will be helpful in future in

ethnopharmacology as a reference tool.

References

- Ernst E (2005) The efficacy of herbal medicine- An overview. *Fund Clin Pharmacol* 19(4): 405-409.
- Rates SMK (2001) Plants as source of drugs. *Toxicol* 39(5): 603-613.
- WHO (1996) Monographs on selected medicinal plants. World Health Organization, Europe.
- Amel B, Salah EIA (1995) Therapeutic utility, constituents and toxicity of some medicinal plants: A review. *Vet Human Toxicol* 37(3): 255-258.
- Shu YZ (1998) Recent natural products based drug development: a pharmaceutical industry perspective. *Journal of Natural Products* 61(8): 1053-1071.
- Brito AR (1996) How to study the pharmacology of medicinal plants in underdeveloped countries. *Journal of Ethnopharmacology* 54(2-3): 131-138.
- Brito ARMS, Nunes DS (1997) Ethnopharmacology and the sustainable development of new plant-derived drugs. *Ciencia E Cultura. Journal of the Brazilian Association for the Advancement of Science* 49:402-408.
- Verpoorte R (1989) Some phytochemical aspects of medicinal plant research. *Journal of Ethnopharmacology* 25(1): 43-59.
- Devi K, Karthikai G, Thirumaran G, Arumugam R, Anantharaman P (2009) Antibacterial activity of selected medicinal plants from parangipettai coastal regions; Southeast coast of India. *World Appl Sci J* 7(9): 1212-1215.
- Liu Y, Wang MW (2008) Botanical drugs: challenges and opportunities- contribution to linnaeus memorial symposium. *Life Sci* 82(9-10): 445-449.
- Magrani M, Zeegwah N, Michel J, Eddouks M (2005) Antihypertensive effect of *lepidium sativum* L. in spontaneously hypertensive rats. *J Ethnopharmacol* 100(1-2): 193-197.
- Mahmood A, Mahmood A, Tabassum A (2011) Ethnomedicinal survey of plants from district Sialkot, Pakistan. *J App Pharm* 02(3): 212-220.
- Muhammad A (2008) 10 medicinal plants of Pakistan. Thesis, institute of pharmacy the faculty of mathematics and natural sciences, the University of Oslo, Europe.
- Ahmad SS, SZ Hussain (2008) Ethno medicinal survey of plants from Salt Range (Kallar Kahar) of Pakistan. *Pak J Bot* 2008 40(3): 1005-1011.
- Shinwari MI, Khan MA (2000) Folk use of medicinal herbs of Margalla Hills National Park, Islamabad. *J Ethnopharmacol* 69(1): 45-56.
- Potter DJ (2014) A review of the cultivation and processing of cannabis (*Cannabis sativa* L.) for production of prescription medicines in the UK. *Drug Test Analysis* 6(1-2): 31-38.
- Bott C, Bishop D (2008) Frequently asked questions about cannabis. The Eldorado county chapter of the American alliance for medical cannabis.
- Kabelik, Marijuana J (2008) History of Marijuana. A1B2B3.
- Elsohly MA, Slade D (2005) Chemical constituents of marijuana: the complex mixture of natural cannabinoids. *Life Sci* 78(5): 539-548.
- Mechoulam R, Gaoni Y (1967) Recent advances in the chemistry of hashish. *Fortschr Chem Org Naturst* 25: 175-213.
- Kala CP, Farooquee NA, Dhar U (2004) Prioritization of medicinal plants on the basis of available knowledge, existing practices and use value status in Uttaranchal, India. *Biodiv Conser* 13(2): 453-469.
- Pope HG Jr, Gruber AJ, Hudson JI, Cohane G, Huestis MA, et al. (2003) Early-onset cannabis use and cognitive deficits: what is the nature of the association? *Drug Alcohol Depend* 69(3): 303-310.

23. Arseneault L, Cannon M, Witton J, Murray RM (2004) Causal association between cannabis and psychosis: examination of the evidence. *Br J Psych* 184: 110-117.
24. Bhattarai NK (1992) Folk use of plants in veterinary medicine in Central Nepal. *Fitoterapia* 63: 497-506.
25. Tariq AL, Reyaz AL (2012) Isolation of cannabinoids from the plant *Cannabis sativa* L. and its potential anticancer activity. *Internat. Res J Biotech* 3: 22-26.
26. Tariq AL, AL Reyaz (2012) Extraction of cannabinoids from *Cannabis sativa* L. plant and its potential antimicrobial activity. *Univ. J Med Dent* 1: 51-55.
27. Ahmad YS (1957) A note on the plants of medicinal value found in Pakistan. Government of Pakistan Press, Pakistan.
28. Saha JC, Savini EC, Kasinathan S (1961) Ecobolic properties of Indian medicinal plants. *Indian J Med Res* 49: 130-151.
29. Rana TS, Datt B (1997) Ethnobotanical observation among Jaunsar-Bawar, Dehra Dun (UP), India. *Intl J Pharmacog* 35(5): 371-374.
30. Singh VK, Ali ZA, Siddioui MK (1996) Ethnomedicines in the Bahraich District of Uttar Pradesh, India. *Fitoterapia* 67: 65-76.
31. Rao RR (1981) Ethnobotany of Meghalaya: Medicinal plants used by Khasi and Garo tribes. *Econ Bot* 35(1): 4-9.
32. Kaplan J (1969) Marijuana: Report of the Indian Hemp Drugs Commission, 1893-1894. Thomas Jefferson Publishing Co, Silver Spring.
33. Kuddus M, Ibrahim AM, Ginawi, Hazimi AAL (2013) *Cannabis sativa*: An ancient wild edible plant of India. *Emir J Food Agric* 25(10): 736-745.
34. Kritkar KR, Basu BD (1975) In: Basu LM (ed.), Indian medicinal plants (2nd edn). International Book Distributors: Booksellers and Publisher, India, pp. 207-300.
35. Nadkarni KM (1982) Indian material medica. (3rd edn), Popular Prakashan Pvt, Bombay, India, Vol. 1.
36. Lavaud C, Voutquenne L, Bal P, Pouny I (2000) Saponins from *Chenopodium album*. *Fitoterapia* 71(3): 338-340.
37. Horio T, Yoshida K, Kikuchi H, Kawabata J, Mizutani J (1993) A phenolic amide from roots of *Chenopodium album*. *Phytochemistry* 33(4): 807-808.
38. Nicholas HJ, Wadkins CL, Hiltibrant RC (1955) The distribution of triterpenes in plants: *Chenopodium album*. *J Am Chem Soc* 77(2): 495-496.
39. Ahmad M, Mohiuddin OA, Mehjabeen, Jahan N, Anwar M, et al. (2012) Evaluation of spasmolytic and analgesic activity of ethanolic extract of *Chenopodium album* Linn and its fractions. *Journal of Medicinal Plants Research* 6(31): 4691-4697.
40. Horio T, Yoshida K, Kikuchi H, Kawabata J, Mizutani J (1933) A phenolic amide from roots of *Chenopodium album*. *Phytochemistry* 33(4): 807-808.
41. Cutillo F, D'Abrosca B, DellaGreca M, Zarrelli A (2004) Chenoalbicin a novel cinnamic acid amide alkaloid from *Chenopodium album*. *Chem Biodivers* 1(10): 1529-1583.
42. DellaGreca M, Di Mariono C, Zarrelli A, D'Abrosca B (2004) Isolation and phytotoxicity of apocarotenoids from *Chenopodium album*. *J Nat Prod* 67(9): 1492-1495.
43. Gohar AA, Elmazar MMA (1997) Isolation of hypotensive flavonoids from *Chenopodium* species growing in Egypt. *Phytother Res* 11(8): 564-567.
44. Dinan L (1992) The analysis of phytoecdysteroids in single (preflowering stage) specimens of fat hen, *Chenopodium album*. *Phytochem Anal* 3(3): 132-138.
45. Dinan L, Whiting P, Scott AJ (1998) Taxonomic distribution of phytoecdysteroids in seeds of members of the *chenopodiaceae*. *Biochem Syst Ecol* 26(5): 553-76.
46. DellaGreca M, D'Abrosca B, Fiorentino A, Previtiera L, Zarrelli A (2005) Structure elucidation and phytotoxicity of ecdysteroids from *Chenopodium album*. *Chem Biodivers* 2(4): 457-62.
47. DellaGreca M, Previtiera L, Zarrelli A (2005) A new xyloside from *Chenopodium album*. *Nat Prod Res* 19(1): 87-90.
48. Pande M, Pathak A (2010) Preliminary pharmacognostic evaluations and phytochemical studies on leaf of *Chenopodium Album* (Bathua Sag). *Asian J Exp Biol Sci* 2010 1(1): 91-95.
49. Joshi A, Chauhan RS (2012) Evaluation of anticancer activity of *Chenopodium album* leaves in bhk-21 cells. *International Journal of Universal Pharmacy and Bio Sciences* 1: 92-102.
50. Nigam V, Paarakh PM (2011) Hepatoprotective activity of *chenopodium album* linn. against paracetamol induced liver damage. *Pharmacologyonline* 3: 312-28.
51. Nigam V, Paarakh PM (2011) Hepatoprotective activity of *chenopodium album* linn. against alcohol induced liver damage. *International Journal of Phytomedicine* 3: 511-523.
52. Nigam V, Paarakh PM (2011) Anti-ulcer effect of *chenopodium album* linn. Against gastric ulcers in rats. *International Journal of Pharmaceutical Sciences and Drug Research* 3(4): 319-322.
53. Korcan SE, Aksoy O, Erdogmus SF, Cigerci IH, Konuk M (2013) Evaluation of antibacterial, antioxidant and DNA protective capacity of *Chenopodium album's* ethanolic leaf extract. *Chemosphere* 90(2): 374-379.
54. Singh KP, Dwevedi AK, Dhakre G (2011) Evaluation of antibacterial activities of *chenopodium album*. *International journal of applied biology and pharmaceutical technology* 2(3): 398-401.
55. Amjad L, Alizad Z (2012) antibacterial activity of the *chenopodium album* leaves and flowers extract world academy of science, Engineering and Technology 6(1): 14-17.
56. Usman LA, Hamid AA, Muhammad NO, Olawore NO, Edewor TI, et al. (2010) Chemical constituents and anti-inflammatory activity of leaf essential oil of nigerian grown *Chenopodium album* L. *EXCLI J* 9: 181-186.

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