

ETHNOBOTANICAL STUDY OF WOUND HEALING HERBS AMONG THE TRIBAL COMMUNITIES IN NORTHERN HIMALAYA RANGES DISTRICT ABBOTTABAD, PAKISTAN

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Abstract

The present paper reports therapeutic uses of medicinal plants for wounds healing by the tribal communities of Northern Himalayan Range, district Abbottabad which was recorded during January 2007 to April 2009. A total of 27 plant species belonging to 23 families are identified which are being used by the people of the study area. One hundred informants of different age (35 to 90 years old) were interviewed to extract ethnomedicinal data using semi-structured questionnaire. Present study provides baseline data on wound healing properties of native plants that can be exploited by pharmaceutical industry for screening new active compounds.

Introduction

Plant-based medicines enjoy a respectable position today, especially in the developing countries, where modern health service is limited. Indigenous remedies which are more effective, safe and inexpensive are gaining popularity among both rural and urban areas. Information from ethnic groups or indigenous traditional medicine has played a vital role in the discovery of novel products from plants as chemotherapeutic agents (Katewa *et al.*, 2004). The world health organization (WHO) has emphasized the importance of the traditional indigenous medicines, since a large majority of rural people in the developing countries still use these medicines as the first defence in health care (Goleniowski *et al.*, 2006). Globally, about 85% of all medications for primary health care are derived from plants (Farnsworth, 1988).

Pakistan is bestowed with a unique biodiversity, comprising of nine major ecological zones. Due to its salubrious climate, Pakistan is quite rich in medicinal herbs which are scattered over a large area. The country has about 6,000 species of wild plants of which about 400-600 are considered to be medicinally important. In Pakistan, medicinal plants are primarily used by Tibbi dawakhanas (medical centres of indigenous physicians known as hakims). Unfortunately, very little attention has been paid to the ethnobotanical aspect of plants as hakims are only concerned with the floral and vegetative parts of medicinal plants without any regard to their botanical characteristics, or distribution in the various ecological zones of Pakistan (Hamayun *et al.*, 2005).

The study of traditional uses of plants in Pakistan has been increasing during the last few years and has enabled the collection of a significant knowledge. In North West Frontier Province (NWFP) of Pakistan (Haq & Shah, 1986; Haq & Rehman, 1990; Haq & Hussain, 1993; Haq & Hussain, 1995, Badshah *et al.*, 1996; Inam *et al.*, 2000; Shinwari & Khan, 2000, Hussain, 2003; Dastagir & Abbasi, 2004; Abbasi *et al.*, 2005; Hamayun *et al.*, 2005; Saqib & Sultan, 2005; Hussain *et al.*, 2006; Shah & Khan, 2006; Zabihullah *et*

al., 2006; Hussain *et al.*, 2008; Khan & Khatoon, 2008; Abbasi *et al.*, 2009; Ali & Qaiser, 2009 & Qureshi *et al.*, 2009b) have documented medicinal plants from various regions of NWFP, but to our knowledge no systematic ethnobotanical study of medicinal plants used for wound healing in Northern Himalaya ranges district Abbottabad, (NWFP) of Pakistan has been made.

The main aim of the present study was to document and compile diverse and disperse indigenous knowledge of century's experienced therapeutic uses of medicinal plants for wound healing by the tribal people living in this area for which no literature is still available.

Study area: District Abbottabad is named after Major James Abbott, the first deputy commissioner of Hazara (1849-1853). It is located between 33° 50' to 34° 23' north latitudes and 72° 35'to 73° 31' east latitude. It occupies an area of 1967 km²with luxuriant vegetation. The district is bounded by Mansehra district to the north, Muzaffarabad district (AJK) and Northern areas to the east, Haripur district, to the west and Islamabad to the south (Fig. 1). The area is largely located on the Iranian plateau and Eurasian land plate, while peripheral eastern regions are located near the Indian subcontinent. The slopes are generally gentle to moderately steep with projecting rocks along its main ridges in the higher reaches. Mean maximum temperature in June has been recorded as 32.41°C and mean minimum as 1.7°C in January. The annual rainfall average has been recorded as about 47 inches, but as much as 25 inches falls during the south-west monsoon (Anon., 1998). The soil of the area is dark greyish brown to dark yellowish brown, slightly gravelly, shallow, silt loams and moderately deep (Hussain & Ilahi, 1991). Due to lush green vegetation, hilly tracts, diverse ethnic culture, the range is of wider interested by tourists through out the world.

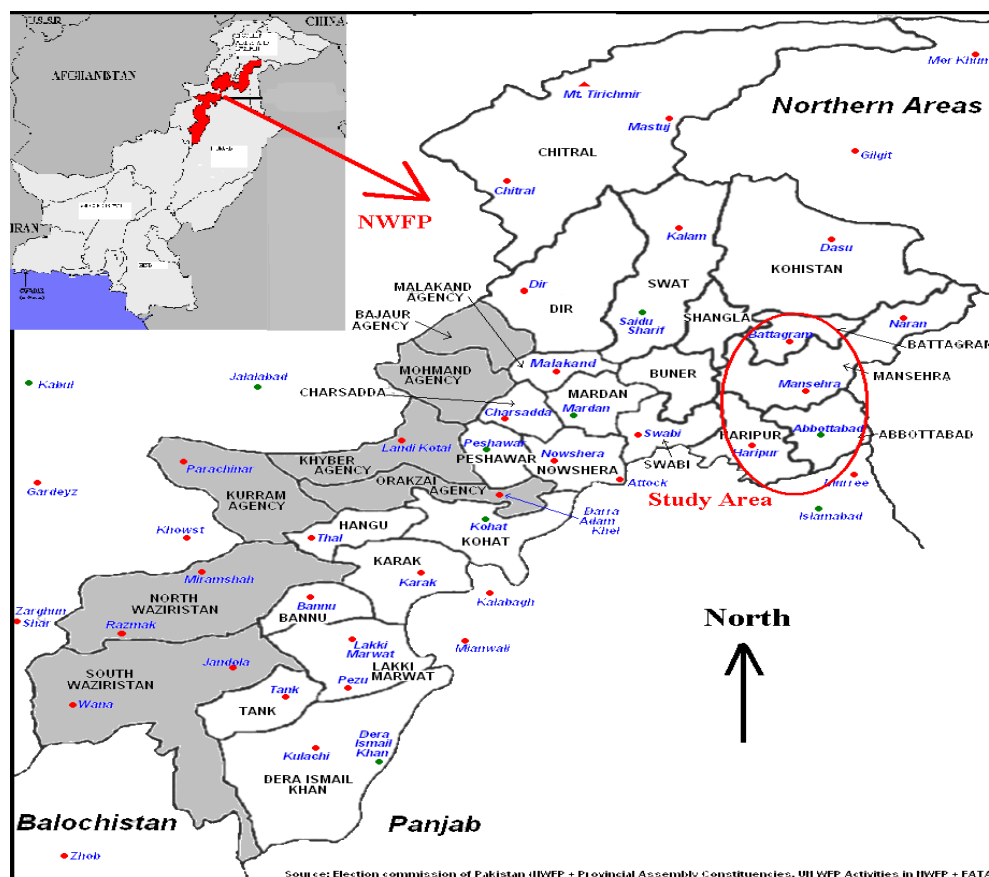


Fig. 1. Map showing study range.

Material and Methods

The study was carried out by interviewing 100 informants including 50 male, 30 female and 20 herbalists in 50 remote sites of the study area during 2007 to April 2009. The methodology was adopted by following the work of Ahmad *et al.*, (2007), Qureshi & Bhatti (2008) and Qureshi *et al.*, (2009a). The survey was unique in that the emphasis was on both male and female members of the community. The medicinal herbal data sheet was incorporated to get detail information on specific plant used by the inhabitants. Female interviews begin with brief introduction and purpose of study which help to gain the trust of female, therefore allowing them to talk freely. Transect walks were carried out with tribal people for collection of correct species with their original habitat. Collected data was also cross checked in different areas from local informants either by showing the plant specimen or telling local names to the informants to verify the authenticity of claims. Specimens were identified with the help of available literature (Nasir & Ali 1970-1989; Ali & Nasir 1989-1991; Ali & Qaiser, 1990-1991, 1993-2007), mounted on herbarium sheets and deposited with voucher numbers in Quaid-e-Azam University Herbarium, Islamabad, Pakistan.

Results

All plant species are alphabetically arranged mentioning botanical name; voucher number; family; local name; parts used; method of preparation and application. The ethnobotanical inventory is presented in Table 1.

Discussion

Wound may be defined as a loss or breaking of cellular and anatomic or functional continuity of living tissue. Wound healing or wound repair is the body's natural process of regenerating dermal and epidermal tissue. Wounds can be broadly categorized as having either an acute or a chronic etiology including bites, burns, surgical wound abrasion, laceration or acute inflammatory phase followed by synthesis of collagen and the extra cellular macromolecules which are later remolded to form, scar (Deodhar & Rana, 1997). The process of wound healing occurs in four phases: (i) coagulation, which prevents blood loss, (ii) inflammation and debridement of wound, (iii) repair, including cellular proliferation, and (iv) tissue remodeling and collagen deposition (Puratchikody *et al.*, 2006). Wound healing involves continuous cell-cell and cell-matrix interactions that allow the process to proceed in three overlapping phases viz., inflammation cellular proliferation and remodeling (Kokane *et al.*, 2009).

In the present analysis, 27 plant species belonging to 23 families have been documented for their therapeutic uses to heal wounds. Among them, 11 species were cultivated and remaining 15 were wild. The most commonly reported families were Astraceae, Meliaceae, Ranunculaceae and Rosaceae. The plant parts used ranged from leaves (13), bark (3), bulb (2), rhizome (2), roots (2), whole plant (2), flowers, pulp and resin in some cases Table 1. Local communities use 28 indigenous phytotherapies to treat wounds. The method of preparation falls into four categories, paste, powder, juice and decoction. Fresh pulp, warm resin and leaves were also used. In regard to the wound condition, the preparations were applied more than one times daily until healing was evident.

–Table 1. Medicinal plants used by tribals of Northern Himalayas district Abbottabad, (NWFP), Pakistan.

Botanical name/ voucher number	Family	Local name	Parts used	Preparation and application
<i>Allium cepa</i> L. (ISL.....55)	Alliaceae	Thoom	Bulb	One to two scales are warmed in <i>Brassica campestris</i> oil and crushed. This paste is applied externally twice a day for 2-3 days.
<i>Aloe vera</i> auct. non Mill. (ISL.....59)	Liliaceae	Kawar gandal	Leaf pulp	Flush leaf pulp is applied on bleeding wounds twice per day for 1-2 days.
<i>Arisaema speciosum</i> (Wall.) Mart. (ISL.....63)	Araceae	Adbes	Bulb	Fresh bulbs are roasted and powder is sprinkled thrice a day for 1-2 days.
<i>Berberis lycium</i> Royle. (ISL.....15)	Berberidiaceae	Sumbal	Bark	Powder from dried bark is sprinkled on injured parts thrice a day for 5-6 days.
<i>Bergenia ciliata</i> (Haw) Sternb. (ISL.....45)	Saxifragaceae	Batpaia	Rhizome	Dried rhizomes are ground and powder is applied twice a day for 2-3 days.
<i>Bryophyllum pinnatum</i> (Lam.) Oken. (ISL.....35)	Crassulaceae	Pathar chat	Leaves	A fresh leaf is warmed and wrapped on pussy wound twice a day for 1-2 days.
<i>Carissa opaca</i> Stapf-ex Haines. (ISL.....302)	Apocynaceae	Garanda	Roots	Powder of dried roots is sprinkled on wounds and infected sores thrice a day for 3-4 days.
<i>Cedrela toona</i> Roxb. ex Rottle. & Willd. (ISL.....302)	Miliaceae	Nem	Bark	Dried bark is ground and powder is sprinkled twice a day for 4-5 days.
<i>Clematis grata</i> Wall. (ISL.....225)	Ranunculaceae	Dhand	Leaves	Juice of fresh leaves is externally applied as germicidal.
<i>Cynodon dactylon</i> (L.) Pers. (ISL.....101)	Poaceae	Khabbal	Whole plant	Paste (Malum) of fresh plant is applied twice a day for 1-2 days.
<i>Dodonaea viscosa</i> (L.) Jacq. (ISL.....320)	Sapindaceae	Sanatha	Leaves	Fresh leaves paste is externally applied as germicidal thrice a day for 2-3 days.
<i>Malvestrum coromandelianum</i> (L.) Gareke. (ISL.....232)	Malvaceae	Sonchal	Leaves	Paste of fresh leaves is applied twice a day for 1-2 days.
<i>Melia azedarach</i> L. (ISL.....77)	Miliaceae	Dhrek	Leaves	Paste of fresh leaves is used for healing as germicidal twice a day for 1-2 days.
<i>Ostegia limbata</i> (Benth), Boiss. (ISL.....119)	Lamiaceae	Kori booi	Leaves	Dried leaves are ground and mixed in butter. This paste is applied thrice a day for 4-5 days.

Table 1. (Cont'd.).

Botanical name/ voucher number	Family	Local name	Parts used	Preparation and application
<i>Oxalis corniculata</i> L. (ISL.....150)	Oxalidaceae	Gandorah	Whole plant	Juice of fresh plant material is applied topically as germicidal and to stop bleeding thrice a day for 1-2 days.
<i>Pinus roxburghii</i> Sargent. (ISL.....125)	Pinaceae	Chir	Resin	Slightly wormed resin is applied topically to check bleeding.
<i>Pistacia integerrima</i> J.L. Stewart ex Brandis. (ISL.....22)	Anacardiaceae	Dhaman	Bark	Bark powder is sprinkled on wounds twice a day for 3-4 days.
<i>Prunus persica</i> (L.) Batsch (ISL.....11)	Rosaceae	Aru	Leaves	Juice of fresh leaves is applied topically as wormicidal for 1-2 days to heal.
<i>Ranunculus laetus</i> Wall. ex. H. & T. F. & Thoms. (ISL.....113)	Ranunculaceae	Chambel booti	Leaves	Paste from fresh leaves is applied topically as germicidal once per day for 1-2 days.
<i>Rumex chalepensis</i> Mill. (ISL.....121)	Polygonaceae	Hula	Roots	Paste of fresh roots is externally applied as germicidal for 2-3 days.
<i>Savvia moorcroftiana</i> Wall. ex. Bth. (ISL.....72)	Lamiaceae	Ghana	Leaves	Paste of fresh leaves is externally applied twice a day for 1-2 days.
<i>Solanum incanum</i> L. (ISL.....233)	Solanaceae	Kachmach	Leaves	Decoction of fresh leaves is used as antiseptic twice a day for 1-2 days.
<i>Tagetes minuta</i> L. (ISL.....231)	Astraceae	Sat-berga	Leaves	Paste of fresh leaves is applied topically thrice a day for 3-4 days.
<i>Trichodesma indicum</i> (L.) R.Br. (ISL.....53)	Boraginaceae	Handusi booti	Leaves	Leaves paste is applied on joints and wounds twice a day for 3-4 days.
<i>Verbascum thapsus</i> L. (ISL.....59)	Scrophulariaceae	Gidar tambaco	Leaves	Powder from dried leaves is sprinkled topically twice a day for 3-4 day.
<i>Woodfordia fruticosa</i> (L.) S. Kurz. (ISL.....81)	Lythraceae	Tavi	Flowers	Powder of dried flowers is sprinkled on wounds thrice a day for 4-5 days.
<i>Zingiber officinale</i> L. (ISL.....88)	Rosaceae	Halder	Rhizome	Powder of dried rhizome is applied topically thrice a day for 1-2 days.

To our knowledge, present use of *Allium cepa*, *Arisaema speciosum*, *Carissa opaca*, *Cedrella toona*, *Clematis grata*, *Melia azedarach*, *Pinus roxburghii*, *Prunus persica*, *Ranunculus laetus*, *Rumex chalepensis*, *Tagetes minuta*, *Woodfordia fruticosa* and *Zingiber officinale* to cure wounds were rarely reported before from Pakistan. Present investigation indicates that powder from the bulb of *Arisaema utile* is sprinkled on wounds while same species was reported for snake bite (Shah & Khan, 2006), in Siran valley district Mansehra. Roots of *Carissa opaca* were reported to be antiseptic (Shinwari & Khan, 1998), where as present study reported that this plant is used to heal wounds. Leaves paste of *Melia azedarach* was used to cure wounds, while, (Ahmad *et al.*, 2003) reported that this plant is beneficial against scabies, carbuncles and abscess in district Attock. Root paste of *Rumex chalepensis* was applied topically on wounds by the inhabitants of the study areas, while same plant has been recorded earlier as useful for cutaneous disorder in Margalla hills, Islamabad (Shinwari & Khan, 2000).

The therapeutic use of plant species reported in this paper to heal wounds is rarely reported from Pakistan. So, Screening for active chemical substances from these plants and testing their biological activities against infectious organisms is the need of hours in order to establish scientific ground for searching new active compounds. Present investigation provides baseline information to screen out biological activities of these valuable plants in order to develop new antiseptic and insecticidal medicines from plant origin.

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