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A review study on ethnobotanical study of medicinal plants used in relief of toothache in Lorestan Province, Iran

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ABSTRACT

Objective: To document information about medicinal plants existed in Lorestan Province that are effective in relieving toothache.

Methods: In this study, traditional information was collected from native people living in Lorestan Province Cities and indigenous information was obtained by corporation of cooperators in the Treatment and Health Network in Doroud, Boroujerd, Khoramabad, Pole Dokhtar, Nourabad, and Kouhdasht Cities in Lorestan Province.

Results: Results of the study showed that people in Lorestan Province used 14 plants in order to relieve toothache. Indigenous information of traditional medicine revealed that medicinal plants of Zagros Mountains in Lorestan Region can be one of the rich and unique resources for producing herbal drugs.

Conclusions: Mentioned plants in the study contain bioactive materials and their therapeutic effects and mechanism for different diseases have been determined. Variety of medicinal plants used by people, their extensive therapeutic uses in this study and presence of rich and variable vegetation in this province present importance of medicinal plants for traditional treatments. Hence, it is proposed to perform more studies regarding effectiveness and possible harms of medicinal plants used by people in order to take necessary actions to produce natural drugs and relief toothache with their pharmacologic positive effects.

1. Introduction

Pain is one of the today's problems of different societies and a warning for tissue harm. The pain is one of the most common problems that human has always faced and has tried to find a way to get rid of it^[1]. Suffering from pain for a long period may impose undesirable mental effects on the person. Human has always tried to find a solution to decrease or kill the pain. Hence he/she has tried to discover the pain reason and relieve it^[2]. The pain as the most prevalent clinical

complaint has various reasons and in spite of extensiveness of using pain killers, we still have problem to relieve it. So using traditional medicine especially plant therapy has been considered by researchers in recent years^[3]. Nowadays, medicinal plants constitute important part of traditional medicine in many countries and have special position and value in modern therapeutic approaches^[4–9]. At the present time medicinal plants and their derivatives constitute more than 20% of medications in developed industrial countries and 80% in developing countries^[10]. Use of medicinal plants has been the prior choice to resist against diseases. Extracted plants and materials are used to treat different diseases in human^[11–13]. This leads to production of drugs of plant origin like morphine, atropine, ephedrine, codeine, reserpine, vinblastine and vincristine *etc.* Very often available drugs have many side effects^[14–16]. Now to control the pain, drugs such as non-steroidal anti-inflammatory drugs like aspirin, as well as opioids including morphine, meperidine, methadone,

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tramadol, buprenorphine, nalbuphine and other drugs such as antidepressants, corticosteroids and adjuvant analgesic drugs are used to relieve pain^[17,18]. The heritage obtained from the traditional medicines in Iran, before and after Islam, is considered as one of the richest treasures of the science, culture, art and human civilization. According to statements of historians, medical plants sciences and their related sciences have special position in this valuable and unique treasure^[19–21]. World society pays special attention to traditional treatments and necessity to extract drug from natural materials, especially medicinal plants^[22–24].

Regarding importance of valuable indigenous information on traditional treatments, and preventing and treating dental diseases especially making the pain relief safe, effective and cheap, this study was performed with the aim of documenting information of effective medicinal plants of Lorestan Province in treating the toothache decrease. Oral/dental diseases are of the most prevalent complications in the world and majority of people experience these diseases several times during their life^[25].

2. Materials and methods

2.1. Studied region

Lorestan Province is located in the west of Iran between 66°51'–50°3' east longitude from the Greenwich meridian and

32°37'–34°22' north latitude from the equator. This province has four different climates (semiarid, mild semi-humid, cold semi-humid and heights climate). The province occupies an area of about 28300 ha.

Its minimum altitude is 330 m in the Zal Bridge and the maximum altitude is 4050 m in the Oshtorankoo. This province has variable climate and this variety is completely obvious from north east to south west. Lorestan neighbors Hamedan and Markazi Provinces in the north, Isfahan in the east, Khuzestan in the south and Kermanshah and Ilam Provinces in the west.

2.2. Information collection

Traditional remedial information of the medical plants in this study were obtained through interview and questionnaire and cooperation with the Lorestan planning and management organization, Technology and Research Assistance of Lorestan Medical Sciences; beneficial indigenous information of people in the province were also collected through cooperation of the Treatment and Health Network in cities of Doroud, Boroujerd, Khoramabad, Alshotor, Pole Dokhtar, Aligudarz, Nourabad, and Kouhdasht in Lorestan Province.

3. Results

Results were obtained by studying information about medicinal plants in eight cities of Lorestan and finally it was

Table 1

Ethnobotanical information of the plants with the anti-toothache effect.

The scientific name	Family	Local name	Persian name	The used part	Method of use	Collection season	Traditional therapeutic effect
<i>Pistacia atlantica</i>	Anacardiaceae	Adamse gholeng	Turpentine	Tree syrup	The fresh syrup is put on the carious tooth	All seasons	Toothache
<i>Daphne mucronata</i>	Thymelaeaceae	Daphene	Mazerion	Skin, syrup and seed	The seed and skin are put on the tooth to decrease the pain	All seasons	Toothache
<i>Vitis vinifera</i>	Caprifoliaceae	Angir	Grape	Fruit	Verjuice is placed in a glass container and then exposed to the sunshine to become red and usable	Summer and spring	Toothache
<i>Pistacia khinjuk</i>	Anacardiaceae	Berizhe–Kuhi	Baneh	Tree syrup	It is put on the tooth	Summer	Toothache
<i>Mentha longifolia</i>	Lamiaceae	Pineh	Pennyroyal	Flower and leave	Mixture of decoction or the dried plant with paste is put on the tooth	Summer and spring	Toothache
<i>Ruta graveolens</i>	Rutaceae	Jerit	Sodab	Syrup	Syrup is poured onto the tooth	Summer and winter	Toothache
<i>Papaver rhoeas</i>	Papaveraceae	Khashkhash	Corn poppy	Syrup	Some syrup is put on the tooth	Spring	Toothache
<i>Peganum harmala</i>	Zygophyllaceae	Esphand	Espan	Seed	Seed is boiled in the water to obtain a concentrated decoction and then one drop is put on tooth after it is tepefied	Summer	Toothache
<i>Tanacetum parthenium</i>	Asteraceae	Colous	Callus	Root	Decoction is put on the tooth	Spring	Toothache
<i>Juniperus excelsa</i>	Cupressaceae	Kamar–Os	Persian Juniper	Branch	Syrup is put on the tooth	Late spring	Toothache
<i>Salvia hydrangea</i>	Lamiaceae	Gol–e Arooneh	Maryam goli	Flower	Infusion is drunk like tea	Spring	Toothache
<i>Salvia multicaulis</i>	Lamiaceae	Gol–e Paeizeh	Mardghoush	Flower	Flower as fresh or extract is put on the carious tooth	Autumn	Toothache
<i>Cerategus monogyne</i>	Rosaceae	Girch	Common hawthorn	Fruit	Fruit is boiled and then concentrated decoction is put on tooth	Autumn	Toothache
<i>Glycyrrhiza glabra</i>	Papilionacea	Shirin Bayan	Liquorice	All parts especially root	The root is put off from the soil and then put on the tooth after cleaning it	Autumn and spring	Toothache

determined that 14 medicinal plants in the province were used extensively as anti-pain agent and could relieve toothache. Some information like the used part, collection season, method of use, and therapeutic effect on the toothache were collected. Other complementary information of the used plants including scientific name, family name, local name and the Persian name are presented in Table 1. People living in the province use different traditional therapeutic methods to relieve toothache, which depend on type of the special plants. Plant extract, plant poultice, verjuice, plant decoction *etc.* are the most common methods to treat the toothache.

4. Discussion

Today medicinal plants with anti-pain effect have received attentions and many researchers around the world are focused on this issue. Medicinal plants play an important role in the people and societies' health. Medicinal value of these plants depends on chemical compounds available in them, which cause special physiologic effects on the human body. The most important substances are tannins, flavonoids and phenolic compounds[26–28]. These phenolic compounds, especially flavonoids possess antinociceptive activities[29]. In the traditional medicine of Iran, the fruit of *Pistacia khinjuk* (Baneh) has antimicrobial, antifungal, anti-inflammatory and antiviral properties and is used to treat gastrointestinal tract disorders and throat diseases. Of other properties anti-inflammatory, anti-cancer and anti-rheumatic properties can be mentioned. Moreover, it is used to treat diarrhea, kidney stone, asthma, jaundice, eczema and stomachache. Also this plant is styptic, stimulus and mucoactive[30]. Phytochemical compounds available in some species of *Pistacia khinjuk* are gallotannin, flavonoids, terpenoid, essential oils and resins, and their antioxidant effects have been attributed to presence of these compounds[31]. It seems that the effect of the Baneh plant on toothache is due to presence of the mentioned compounds and its antioxidant property. The grape kernel is a rich resource of phenolic compounds like catechins, epicatechins and proanthocyanidin tri-merrik, tetra-merrik and di-merrik and these compounds are known as anti-mutation and antiviral factors. Phenolic compounds that are found normally in edible and non edible resources have various biologic effects like antioxidant activity. So, they are regarded highly in the food industries, since they can inhibit oxidative changes of fats so as to improve nutritional value and quality of food products[32–34]. Many nutrition specialists recommend consumption of plants, vegetables and fruits to

obtain necessary antioxidants since usual consumption of plant antioxidants provides less side effects and improves the treatment efficacy. Plants are one of the rich resources of natural antioxidants that improve plasma antioxidant ability and decrease chance of developing some diseases like cancers, cardiac diseases and brain stroke[35–41]. Chemical compounds of grape extract include flavonoids, tannins (catechins and epicatechins), proanthocyanidins and non flavonoids compounds like resveratrol[42]. Grape extract and seed have protective effects on heart, liver, and damages resulted from high levels of glucose and oxidations induced on low density lipoprotein lipids. Fibrogenic damages resulted from bleoxane and skin cancer have been proved[43,44]. Each of the compounds and antioxidants existed in the grape fruit can be effective substances and affecting on the pain. Results of a study conducted on the hydroalcoholic extract of the grape seed determined that the anti-pain effect of extract with dosage of 400 mg on the first phase of pain was more than aspirin and less than morphine. Its anti-pain effect in the second phase of the pain is less than morphine and has not significant difference from aspirin[45]. Different parts of *Mentha pulegium* plant have tannin, resin, pectin, sugar and essence[46]. Effective substances of this plant include pulegone, menthone, isomenthone, piperitenone, limonene, menthol, hesperidin, diosmin and azolen[47]. In the traditional medicine this plant is used to treat tympanites and tomia and has also antispasmodic and carminative effect[48]. Also it is used as antiseptic and exterminator, and causes menstruation[49,50]. The most frequent alkaloids available in the Papaveraceae plant include morphine (anti-pain and calmative), codeine (anti-pain and calmative), papaverine (muscle relaxant and vasodilator), noscapine (antitumor and anticough), sanguinarine (a type of antibiotic), and narceine[51–55]. The main alkaloid in the *Peganum harmala* (*P. harmala*) plant is a substance named harmaline that becomes inactive when exposed to light. This substance causes tumor and colonic seizure in high dosages[53]. In the traditional medicine it is used to treat different diseases. Also it has been shown by different scientific studies that seeds of this plant have appetitive and diuretic effect and interfere in treatment of nervous and arterial diseases[53]. Reports have proved that the harmaline is muscle relaxant and sedative. Recently anti-pain effects have been reported for the alkaloid extract of *P. harmala* and it seems that its anti-pain effects are applied through the central and peripheral nervous system[56]. In the traditional medicine this plant is reported to be sedative and has effect on treatment of nervous disorders[57]. It seems that the anti-pain effect of the *P.*

harmala plant attributes to the presence of harmaline. One of important effects of the *P. harmala* alkaloids in human is the psychotropic effect that is resulted from inhibitive properties of beta-carboline alkaloids (monoamino oxidase) on the central nervous system[58]. Flavonoids with protective property and some antioxidants like quercetin are found in large amount in the *Crataegus*[59]. Quercetin well confirms anti-diabetic, contracture reducing and telangiectasis response increasing effects of this flavonoid. Quercetin induces the release of vasodilator substance which is called nitric oxide that increases its availability to enhance the vasodilatory effects needed to endothelium tissue[60]. Acid glycerin is the most important active substance of *Glycyrrhiza glabra*[61]. The most known isoflavons available in the *Glycyrrhiza glabra* root are glabridin, glabrol, formononetin, glabrin and isolicoperitin. This plant also contains some compounds like steroids, coumestans, and teriterpene glycosides[62]. Medicinal plants have been always the most important medicinal resources in treatment of important and dangerous diseases like gastrointestinal disorders, cancer, diabetes, arteriosclerosis and parasitic diseases[63–70].

With regard to long history of the traditional medicine and use of medicinal plants in Iran, we can say that this kind of treatment has root in culture of this region[19]. Lorestan Province is not also excluded with regard to its geographical and environmental situation. Anyway plant species of Lorestan Region have high importance in treatment of diseases and can be utilized if it is exactly managed and planned. Indigenous information of the traditional medicine in Lorestan Region can be one of the resources to produce herbal remedies. Used plants contain bioactive materials and their different therapeutic effects have been known for different diseases. So, clinical researches can be conducted by using indigenous information of this region and if their effects are proved, they can be used for mass production of drug in Iran. Variety of medicinal plants used by people and their extensive remedial consumptions in this study as well as presence of rich and variable vegetation in this province have proposed importance of paying attention to medicinal plants as one of the most commonly used traditional treatments. So more studies are recommended to be conducted regarding effectiveness and possible disadvantages of medicinal plants used by people.

Conflict of interest statement

We declare that we have no conflict of interest.

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