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Ethnomedical practice used for treatment of diabetes mellitus from Hawler City, Kurdistan Region \ Iraq

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Abstract

Present study aim in to recording herbal remedies used for treatment and controlling of diabetes mellitus in Hawler city, Kurdistan Region\Iraq. During the survey, 25 angiosperm species belonging to 31 genera of 18 plant families were recorded by peoples of study area. The dominant plant families were Lamiaceae (4 species), Different modes of usage have been used mostly infusion form herbal remedy were adopted. Variant parts of plant were used either inform of dry of fresh form, leaves were mostly recorded. Herbaceous plant family constitute about (60%) of collected herbal remedies. *Trigonella foenum graecum*, *Rheum officinale* and *Citrullus colocynthis* plants were recorded by more than one informants in the study.

1. INTRODUCTION

Different diseases have been treated using plant based drugs from ancient time. an important plant wealth have been provided by the nature to the man kind and all living things on the earth¹. A large number of plant activity have not been explored yet, even the value of some of them are published. There is a need for ensuring and ascertain the theraputic activity of plants through conduction pharmacological and pharmacognositic studies². About 343 plant around the world have been tested for their antidiabetic activity, while ethnobotanical information records 800 Indian plants and 158 plants (from Ayurved) with antidiabetic activity around the world^{3,4}. Diabetes mellitus is a chronic clinical syndrom distinguished by hyperglycemia, hyperaminoacidemia, hyperlipedimia and hypoinsulinaemia [which characterized by either decrease in insulin action or secretion] associated with many complications, macro and micro vascular disease, cerebrovascular disease. Diabetes directly affecting of the life quality enhancing risk factors for morbidity and mortality^{5,6,7}. Diabetes mellitus is a disease of all ages with a high percentage of prevalence in worldwide about 2.8% in 2000 and expected to be 5.4% in 2025. allopathic drugs used for the treatment of diabetes were insulin and antidiabetic drugs which are in almost conditions were expensive and cannot be reached easily specially in developing countries, marked by series side effects^{8,9}. Recently there were a increased tendency for the ethnomedicine for treatment of variety of diseases including diabetes, since the side effects associated with therapeutic drugs (hypoglycemic agents)¹⁰. It have been estimated that more than 1000 plants were used in traditional medicine as an ethnomedical treatment of diabetes mellitus¹¹. The aim of the present study was to present the ethnomedical treatment practicing in health care system used by the Kurdish community and traditional practionar for treatment of diabetes in Hawler city, Kurdistan Region\ Iraq.

2. METHODOLOGY

A survey have been conducted by frequent field trip in Erbil city (specially rural areas), Kurdistan Region\ Iraq. Ethnomedical data were collected via individual interviews using semi-structured open-ended questionnaires as proposed in standard literature on the basis of their knowledge related to the use of medicinal plant in ethnomeidicine treatment of diabetes^{12,13}. Data were collected on the basis of their During the

survey information collected about plant materials like medicinal part, method of usage of crude plant, formula and duration were recorded. Field investigation were conducted during April 2014 to March 2015 in different villages and traditional healers in Erbil city. The questionnaire investigated the information regarding plants name (local name), medicinal part of plant method of preparation and duration of usage was on the basis of structured questionnaire¹⁴. Each ethnomedicinal treatment were cross checked from more than 2 informants.

3.RESULTS AND DISSCUSION

From the ethnomedical treatment of diabetes study in Erbil city revealed that 25 angiosperm species belonging to 31 genera of 18 plant families used for treatment and controlling of diabetes. Investigated ethnomedical data were presented in a classified subgroups according to their usage [single or mixture] in Table 1 and Table 2.

Table 1: Single plant material used as anti-diabetic

Botanical Name	English Name	Local Name	Family	Medicinal Part (s)	Mode of use	Duration of usage
<i>Zingiber officinale</i>	Ginger	Zanjafel	Zingiberaceae	Roots	Ginger tea either fresh or dry plant (infusion) administered orally twice daily before meal.	Continuous
<i>Rheum officinale</i>	rubarb	Rewas	Polygonaceae	Root	Dried powdered root incorporated in capsule used, administered twice daily before meal.	Continuous
<i>Olea europaea</i>	Olive	Zaytun	Oleaceae	Leaf	Dried powdered leaves in dose 500 mg capsule once daily, Fresh juice leaves once daily before meal	Continuous
<i>Citrullus colocynthis</i>	Bitter apple	Gozhak	Cucurbitaceae	Leaf, seed	Dried powdered plant material incorporated in capsules administered once daily before meal	Continuous
<i>Punica granatum</i>	Pomegranate	Hanar	Punicaceae	Flower, fruit pericarp	Dried powdered flowers, pericarp juice separately administered twice daily before meal	Continuous
<i>Teucrium polium</i>	Polium	Gul pora (Jaada)	Lamiaceae	Leaf	Infusions drink one or two times daily	Continuous
<i>Thymus serpyllum</i>	Wild thyme	Jatrae wahshi	Lamiaceae	Whole plant	Dried powdered juice, once or twice according to the condition	Continuous
<i>Cichorium intybus</i>	Chicory	Chaqchaqa	Asteraceae	Leaf and Root	Powdered plant material incorporated in capsule or infusion form administered once daily before meal	Continuous
<i>Myrtus communis</i>	Myrtus	Merseen	Myrtaceae	Leaf	Dried powdered plant juice administered twice daily before meal	Continuous
<i>Trigonella foenum graecum</i>	Fenugreek	Hlba (Shemlee)	Fabaceae	Seed	Dried powdered seeds infusion administered twice daily before meal	Continuous
<i>Cinnamomum verum</i>	cinnamon	Darjen	Lauraceae	Bark	Dried powdered barks administered in form of infusion twice daily before meal	Continuous
<i>Nigella sativa</i>	Black seed	Rashka	Ranunculaceae	Seed	Dried powdered seeds administered in form of infusion or powder in capsule, twice daily before meal	Continuous
<i>Urtica dioica</i>	Stinging nettle	Gazgazok	Urticaceae	Leaf	Dried leaf infusions administered twice daily before meal	Continuous
<i>Curcuma longa</i>	Turmeric	Zarda chw	Zingiberaceae	Rhizome	Dried powder rhizomes incorporated in capsules administered before meal	Continuous
<i>Ranunculus ficaria</i>	Lesser celandine	Mameran	Ranunculaceae	Leaf	Dried leaf infusion administered before meal	Continuous
<i>Commiphora myrrh</i>	Myrrh	Mur Makee	Burseraceae	Gum obtained from plant wound	Dried gum incorporated in capsule administered before meal	Continuous
<i>Taraxacum officinale</i>	Dandelion	Talishk, Tarkhashqun	Asteraceae	Leave	Dried leaf infusions administered before meal	Continuous
<i>Lipidium sativum</i>	Garden cress	Taratula	Brassicaceae	Seed	Dried powder seed incorporated in capsule administer before meal	Continuous

Diabetes is wide distributing disease affecting approximately three forth of the world population. Uncontrolled diabetes causes many chronic and series complications, in addition to the high economic lose of society. Limited efficacy and precautions of the side effects of the synthetic drugs (conventional drug therapy) and high costs specially in developing countries yields a great interest for developing of venues for treatment of diabetes mellitus with ethnomedicine which are more accessible and not requires pharmaceutical synthesis¹⁵⁻²¹.

In the present study on the ethnomedical treatment of diabetes mellitus, the investigated data revealed that, the dominant plant families were Lamiaceae (4 species), followed by Zingiberaceae, Poaceae (3 species), two species were recorded for each Asteraceae, Fabaceae, Araliaceae, Myrtaceae families and single species for Punicaceae, Polygonaceae, Cucurbitaceae, Oleaceae, Ranunculaceae, Apiaceae, Lauraceae and Theaceae. Variant plant families have been recorded in different countries for example in Pakistan dominant plant family were Liliaceae²² while in South Africa the dominant plant families used for treatment of diabetes were belong to Asteraceae family²³.

Table 2: Mixture of herbal remedies used as anti-diabetic

Botanical Name	English Name	Local Name	Family	Medicinal Part	Mode of use	Duration of usage
Mixture I						
<i>Rosmarinus officinalis</i>	Rosemary	Jatrae cheay	Laminaceae	Leaf, Flower	Powdered plants encapsulated administered twice daily before meal at starting, then the dose will be reduced to single dose	Continuous
<i>Nigella sativa</i>	Black seed	Rashka	Ranunculaceae	Seed		
<i>Salvia officinalis</i>	Sage	Meramea	Laminaceae	Leaf		
<i>Coriandrum sativum</i>	Coriander	Kazbara	Apiaceae	Fruit		
<i>Lupinus mutabilis</i>	Lupinus	Turmus	Fabaceae	Seed		
Mixture II						
<i>Trigonella foenum graecum</i>	Fenugreek	Hlba	Fabaceae	Seed	Powdered plant mixture capsule taken twice daily before meal	Continuous
<i>Elettaria cardamomum</i>	Cardamom	Hel	Zingiberaceae	Fruit		
<i>Hedera helix</i>	Ivy	Leblab	Araliaceae	Seed		
<i>Myrtus communis</i>	Myrtus	Merseen	Myrtaceae	Leaf		
Mixture III						
<i>Salvia officinalis</i>	Sage	Meramea	Laminaceae	Leaf	Dried powdered plants incorporated in capsule administered twice daily before meal	Continuous
<i>Panax m. ginseng</i>	Ginseng	Ginseng	Araliaceae	Root		
<i>Trigonella foenum graecum</i>	Fenugreek	Hlba	Fabaceae	Seed		
<i>Cinnamomum verum</i>	cinnamon	Darjen	Lauraceae	Bark		
Mixture IX						
<i>Cinnamomum verum</i>	cinnamon	Darjen	Lauraceae	Bark	Infusion mixture of the dried powdered plants administered twice daily before the meal	Continuous
<i>Camellia sinensis</i>	Green Tea	Chea Kask	Theacea	Leaves		
<i>Syzygium aromaticum</i>	Clove	Qanafel	Myrtaceae	Flower bud		
Mixture X						
<i>Punica granatum</i>	Pomegranate	Hanar	Punicaceae	Fruit pericarp	Dried plant materials were mixed in ratio 2:1 [<i>Punica granatum</i> , <i>Olea europaea</i> , <i>Lipidium sativum</i> : <i>Commiphora myrrh</i>] administer either in form of capsule or infusion before meal	Continuous
<i>Olea europaea</i>	Olive	Zaytun	Oleaceae	Leaf		
<i>Lipidium sativum</i>	Garden cress	Taratula	Brassicaceae	Seed		
<i>Commiphora myrrh</i>	Myrrh	Mur Makee	Burseraceae	Gum obtained from plant wound		
Diabetic Breads						
Formula I						
<i>Triticum aestivum</i>	Wheat	Ganm	Poaceae	Seed	Prepared bread from whole dried seeds of <i>Triticum aestivum</i> with incorporations of <i>Nigella sativa</i> seed used as diabetic bread for diabetes control	Continuous
<i>Nigella sativa</i>	Black seed	Rashka	Ranunculaceae	Seed		
Formula II						
<i>Triticum aestivum</i>	Wheat	Ganm	Poaceae	Seed	Prepared bread from whole dried powdered seeds <i>Triticum aestivum</i> with incorporations of <i>Helianthus annuus</i> seed <i>Avena sativa</i> seed used as diabetic bread for diabetes control	Continuous
<i>Avena sativa</i>	Oat	Shofan	Poaceae	Seed		
<i>Helianthus annuus</i>	Sunflower	Gulabrozha	Asteraceae	Seed		
Formula III						
<i>Triticum aestivum</i>	Wheat	Ganm	Poaceae	Seed	Prepared bread from mixture of dried powdered seeds of <i>Triticum aestivum</i> and <i>Hordeum vulgare</i> used as diabetic bread for diabetes control	Continuous
<i>Hordeum vulgare</i>	Barley	Jwo	Poaceae	Seed		

Different mode of usage have been adopted in the application of ethnomedicinal treatment about 34 preparations, infusion (juice) of fresh form or dried of herbal remedies are mainly used by local peoples (about 56 % of preparations) the mostly used method for administration of antidiabetic ethnomedical agents in South Africa and India^{23,24} made by boiling of pulverized dry plant material or fresh plant parts, dried powdered plant incorporated in capsules prescribed by local healers (about 35 % of preparations) and baked dough (bread) supplied by bakeries in the city or they were homemade bread in rural areas. Various parts of plants were used either in dry or fresh state, mainly leaf (11 species) similar finding were exhibited by Erasto *et al*, 2005²³, other parts of plant were used for a smaller extent were seed, root, rhizomes, flower, fruit, bark and whole plant. Among the reported plants there were 60 % of recorded species belong to herbaceous family, 16 % of tree family, and only 12 % for each shrub and grass family. Herbaceous plant families were preeminent family in ethnomedical practice for treating various diseases including diabetes^{23,24}. Continuous administration of ethnomedical agents (herbal remedies) were required either as adjuvant

to conventional drug therapy or as treatment of diabetes, as diabetes was a chronic disease long duration of drug administration required. Investigated data revealed that some of plants were used as single ethnomedical agents while others in combination form (mixtures) similar finding exhibits by Maruthupandian *et al*, 2013²⁵ and Anusha *et al*, 2009²⁶ in India.

From the gathered data three plant species were repeated from more than traditional healers and people contributed in the study which *Trigonella foenum graecum*, *Rheum officinale* and *Citrullus colocynthis*. The antidiabetic activity of the plants were recorded in literatures with different mechanism of action, *Trigonella foenum graecum* shows improving in the glucose homeostasis probably through insulinotropic properties in rates²⁷, *Rheum officinale* activity were exhibited by Edwin *et al*, 2008²⁸ and the antidiabetic activity for *Citrullus colocynthis* were recorded by Gurudeeban and Ramanathana, 2010²⁹. The adopted mechanism of action of the recorded plants were unknown, moreover many antidiabetic herbal remedies were act in part either through fiber content, minerals and vitamins or through their phytochemical constituents^[30]. Insulin deficiency were aggravates from mineral deficiency which a common symptom in diabetic patients. Medicinal plants considered as source for several minerals which acts as a cofactors for insulin action and key enzymes of glucose metabolism^{30,31}.

4. CONCLUSION

The present study will attempt to document the herbal remedies were used by the traditional healers and local communities in the study area. Some of the recorded plants were with potential activity as antidiabetic, which open a venue for discovery of new antidiabetic drugs with less side effects in comparison with alopahthic drugs. The generated information from study will aid in mass knowledge about the ethnomedical practice and community resource for the treatment of diabetes in Hawler city.

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