Original Article

A Survey on the Aromatic Plants of Libya

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ABSTRACT

Objectives: The aim of this study is to investigate on some aromatic plants growing in Libya, their major volatile oils contents and traditional uses, indicating dangerous hazards facing plant biodiversity especially medicinal plants and measures taken to protect them. **Methods:** The study is mainly based on electronic database survey using Scopus, PubMed, and Science Direct, etc. and communication with Libyan local inhabitants of some areas. Gathered information has been evaluated and summarized in tables. **Results:** Aromatic plant of 41 species has been mentioned of medicinal value represented by 14 plant families and 29 genera. Three aromatic plant species growing in Libya are not recognized and used by Libyans. Endemic species are mentioned; *Origanum cyrenaicum*, *Teucrium zononii* and *Ballota andreuzziana*. **Conclusions:** Even though Libya remains as one of the most biologically diverse countries in the Mediterranean region, scarce information about aromatic medicinal plants could be found. Libya is also suffering from extreme biodiversity destruction and degradation due to Sahara expenses and climate changes and other reasons. To deal with the problem IUCN Centre for Mediterranean Cooperation has made a mission in Libya to promote projects.

Keywords: Aromatic Plants, Volatile Oils, Traditional Uses, Endemic Species, IUCN Missions.

INTRODUCTION

Libya is a country in the Maghreb region of North Africa. It has an area of 1760000 square kilometres consisting mainly of desert (more than 90%) and the Mediterranean coast. Coastal strip and El-Jabal El-Akhdar known as the green mountain region which contributes to about 50% of the total plants in the whole country.[1,2] While other percentage of plants are distributed in regions as the El- Jabel El Garbi (Gharian), Ghadames, Awbari and Tarhona regions. There are 2103 plant species in Libya that belong to 856 genera and 155 families.[2] According to literature there are 450 medicinal plants growing in Libya and 208 are recognized and extensively used by Bedouins and local inhabitants in traditional medicine.[3-5] Where about 30% of the population in Libya relies on traditional medicine.[6,7] Although there has been no detailed ethnopharmacological investigation in Libya, aromatic plants are used for treatment of diseases and also in perfumery and cosmetics. Thus the main aim of this investigation is to highlight on some aromatic plant species growing in Libya and their traditional uses. Taking into account that the medicinal plants from Libyan flora is still insufficiently investigated, and the scarce information about the Libyan folkloric medicine especially aromatic plants, this will be the useful review that is carried out on the topic.

MATERIAL AND METHODS

This review is mainly based on communication with some Libyan people using traditional medicines and electronic database survey using Scopus, PubMed, Science Direct and Google Scholar. Gathered information has been evaluated and summarized in Tables.

RESULTS AND DISCUSSION.

According to the literature survey 41 aromatic plants grown widely in Libya are represented

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Table: Traditional uses of the aromatic plants growing in Libya.

Plant name (Family)	Local name usage part	Traditional medicinal Uses	Major compounds	Ref.
Pistacia atlantica Desf Anacardiaceae.	Batum Leaves	It is chewed against respiratory affections.	Terpinene-4-ol, D-germacrene	8, 14
Carum carvi L. Apiaceae	Krweia	Carminative and lactagogue.		9
Coriandrum sativum L. Apiaceae	Kusber	Lactagogue,, carminative. cardiotonic		9
Pimpinella anisum L. Apiaceae	Camun	Tranquilizer, spasmolytic, cough, tonic, diuretic, digestive, increase uterine contractility and lactagogue.		9
Artemisia absinthium L. Asteraceace	Amna- Maryam	Enhance uterine contractility, skin ulcers, kidney stones.		9
Chamomilla pubescens (Desf) Alavi *Chamomilla aurea* Loefl. Asteraceace	Falyia	GIT disorders (flatulence, gastritis), skin diseases (dermatitis), menstruation colic, diuretic urinary tract infection, expectorant, for laryngitis, sinusitis, cracks of feet and hands, and asthma.		10, 8
Commiphora myrrha (Nees) Engl. Burseraceace	Al-morr	Anti-inflammatory, expectorant, antiseptic, emenagogue and vulnerary.		9
Cupressus sempervirens L Cupressaceae	Al-sarow	Cough and heart diseases.		8
Juniperus communis L. *Juniperus phoenicea* L. *Cupressaceae*	Arar Leaves	Gastritis.	*α*-pinene, myrcene, and *β*-phellandrene	9,14
Retama raetam Forssk Fabaceae	Al- ratem Shoot	Diabetes, sinusitis and antitumor	Linalool , limonene	10, 16
Pelargonium odoratissimum L. Geraniaceae	Al-ather Al-arabi	Antidabetic		OC
Ajuga iva(L.) Schreb. *Lamiaceae*	Chendagora Shoot	Gastritis, vomiting, diarrhoea, gastric ulcer, anthelminthic, anti-diabetic, pulmonary disorders	Carvacrol	10,8,12
Ballota andreuzziana Pamp. (Endemic) *Lamiaceae*	Flower buds		Caryophylline	13,
Lavandula multifida L. *Lamiaceae*	Al-kuzami	Externally: antiseptic for wounds Internally: CNS disorders (stress, depression, headache), anti-rheumatic, asthma, diuretic and for gastritis.		9
Marrubium vulgare L. *Marrubium alysson* L. Lamiaceae	Rubia Arial parts	For rheumatism, antidiabetic, expectorant and analgesic for joint pains.	Caryophyllene , cineole, thymol	8, 9,12
Mentha piperita L. *Lamiaceae*	Nanah	Externally: infected wounds and gargle. Internally: spasmolytic, carminative, uterine relaxant, tonic and antinociceptive.		11
Ocimum basilicum L. *Lamiaceae*	Habak Leaves	Stomachic, spasmolytic and carminative.		11

Plant name (Family)	Local name usage part	Traditional medicinal Uses	Major compounds	Ref.
Origanum majorana L. *Origanum vulgare* L. *Origanum cyrenaicum* Beg.&Vacc. (endemic) *Lamiaceae*	Martwosha Arial parts	Externally: inhale crushed leaves during flu to facilitate breathing. Also for ear congestion. Internally: Expectorant, carminative, stomachic and for menstrual cramps. Against dysentery.	Terpinol, geraniol, eugenol, linalool	6,11,15
Rosmarinus officinalis L. *Lamiaceae*	Kelli Leaves and flowers	Externally: Skin cleanser, conjunctivitisand gargle in throat infections and voice cracks. Internally: Anti rheumatic, stomachic, nervous stimulant, menstrual cramps and gallbladder disorders.	Cineol	6,11,12 .
Salvia aegyptiaca L. *Salvia fruticosa* L. *Salvia officinalis* L. *Lamiaceae*	Tefah El-Shahi Aerial parts	Digestive, drowsiness, nervousness, headache, and anti-diabetic.	Aristolene, myrcene and cymene	6,9, 17, 18
Satureja thymbra L *Lamiaceae*	Aerial parts		γ-terpinene, thymol, p-cymene, carvacrol	19, 24
Thymus capitatus L. (Hoffm. &Link). *Thymus serpyllum* L. *Thymus vulgaris* L. *Thymus algeriensis* Boiss. *Lamiaceae*	Zather Leaves	Externally:Gargle, for throat and gum inflammation. Internally:Cough(chest infections and expectorant), gastroenteritis, anthelmintic, cardio tonic and spasmolytic.	Thymol and carvacrol	8,12, 21
Tercrium polium L. *Teucrium apollinis* Maire&Weiller *Teucrium zononii* Pamp.(Endemic) *Lamiaceae*	Jada	Antidiabetic, antihypertensive and for extruding kidney stones.	D- germacrene	9,13, 22
Cymbopgon shoenanthus (L.) Spreng. Poaceace	Edkar	Spasmolytic (especially children), menstrual pain and anti-rheumatic.		9
Rosa damascena Mill. Rosaceace	Al- ward	The seed decoction is used against fevers and headaches or externally applied to cure trachoma, and hair loss.		8,9
Ruta graveolens L. Rutaceace	Fagal	Migraine and compresses for tried eyes. Aerial part used against rheumatic infections and ecchymosis.		11,8
Salvadora persica Wallich, Salvadoraceae	Swak Leaves	Chewing sticks used for tooth cleaning and polishing.	Cineol,caryophyllene, caryophyllene xide	6,14
Solanum nigrum L. Solanaceace	Enab –Al-deib Fruits and leaves	Liver diseases, diuretic, constipation, dermatitis, arthritis, rheumatic, hypertension.	Thymol	11, 10, 20
Verbena tenuisecta Briq. Verbenaceae	Flower buds		Limonene	13

by 14 plant families and 29 genus. Only 18 species were investigated for their essential oil constituents. The endemic plants *Origanum cyrenaicum, Teucrium zononii* and *Ballota andreuzziana* need further investigation. Three species (*Ballota andreuzziana, Satureja thymbra*, *Verbena tenuisecta*) are not used in Libyan Folkloric medicine. Although two species (*Satureja thymbra*, *Verbena tenuisecta*) growing widely in Libya are used all over the world, but not used in Libya.[24] On the other hand Libya is also suffering from extreme biodiversity destruction and degradation due to Sahara expenses and climate changes and other reasons. To deal with the problem IUCN

Centre for Mediterranean Cooperation has made a mission in Libya to promote projects. For this purpose 2 projects were organized by Small Initiatives for Civil Society Organizations in North Africa (PPI-OSCAN) funded by the French Global Environment Facility (FGEF) and the MAVA Foundation and Critical Ecosystem Partnership Fund (CEPF): "*Conservation project for endangered medicinal and aromatic plants in Msallata*" and "*Promoting the value of key biodiversity areas in North Africa through the involvement of civil society in their conservation and management*". In 2015 Tree Friends Association supported by the IUCN in frame work of PPI-OSCAN, started the project '*The conservation of medicinal, aromatic and endangered plant species in Msallata at National Natural Reserve Park'* at Al-saafeen area. The project aims for plant propagation especially medicinal and aromatic plants that are endangered, also greenhouse construction and target plants identified, collected and restricted as a second phase of the project. A map was prepared for redetermination of the geographical region borders of the park, pinpointing areas of target plants.

CONCLUSION

Further phytochemical investigations and documentation of aromatic plants used in traditional Libyan medicine should be carried out immediately. Aromatic plants suffer as well as other plant species in Libya from extreme bio-diversity destruction and degradation due to global climate change, overgrazing, uprooting, and wood cutting especially along the Libyan coast.[23] The projects about the protection and propagation of plant biodiversity in particular medicinal and aromatic plants of Libya must be supported.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

ABBREVIATION USED

CEPF: The Critical Ecosytem Partnership Fund; FGEF: French Global Environment Facility; IUCN: International Union for Conservation of Nature; PPI-OSCAN: Small Initiatives for Civil Society Organizations in North Africa.

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PICTORIAL ABSTRACT

SUMMARY

- According to the our investigation 41 aromatic plants growing wildly in Libya are represented by 14 plant families and 29 genus.
- Amoung them only 18 species were investigated for their essential oil constituents.
- Three species (*Ballota andreuzziana, Satureja thymbra, Verbena tenuisecta*) are not used in Libyan Folkloric medicine.
- Although two species (*Satureja thymbra, Verbena tenuisecta*) growing widely in Libya are used all over the world, but not used in Libya.
- The endemic plants *Origanum cyrenaicum, Teucrium zononii* and *Ballota andreuzziana* need further investigation.

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