

Some Aromatic and Medicinal Plants from Bingöl (Turkey)

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Abstract: The use of aromatic and medicinal plants in developing countries has been widely observed. The increasing human population and demands in the late decades has led to over exploitation of land in many areas thus reducing the biodiversity of medicinal plants. Aromatic and medicinal plants possess odorous volatile substances and the characteristic aroma is due to a variety of complex chemical compounds. This study was carried out in order to contribute aromatic and medicinal plants knowledge of Eastern Anatolia Region of Turkey. This investigation included twenty medicinal or aromatic plant specimens collected and photographed from Bingöl provinces during the vegetation seasons 2016. With this study some medicinal and aromatic plants recorded and photographed; that might be useful for health-care programme, aromatic and medicinal plants knowledge, aromateraphy, phytoteraphy, economic agricultural policy development, alternative food programme, ethnobotany and development of drug sector.

Keywords: Bingöl, Medicinal and Aromatic plants

1. INTRODUCTION

Our country has a rich plant diversity due to the fact that it contains many different habitat types, is located at the intersection of three plant phytogeographical regions, is home to many different species, connects the Asian and European continents, has ecologic differences and rich water resources in addition to change in elevation ranging between 0-5000 meters and this plant diversity of our country has resulted in an increase in the medicinal and aromatic plant taxa [1]. Medicinal and aromatic plants are used as ground cover in agriculture, as decorative plants in parks and gardens, in erosion control, borders, parterre and rock gardens in addition to being used for food, drug and treatment purposes. In addition, medicinal plants are also used in areas such as nutrition, cosmetic, body care, incense or religious ceremonies, whereas aromatic plants are widely used in food, cosmetic and perfume sectors due to their nice scents and tastes [2].

It's different habitats and ecological properties in addition to new plant types that have recently been discovered put forth the richness of Bingol with regard to number and diversity

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of plants [3-6]. Even though our country is richer than Europe with regard to the number of plant species as well as with regard to medicinal and aromatic plants, more than 70% of the herbal substances used for producing drugs are still being imported which prevents our money from remaining inside our country. There are also various plants which are naturally found in the flora of our country among the exported herbal substances. Random, excessive and insensible collection of the economically valuable medicinal aromatic plants place their future generations at risk resulting in economic losses. Medicinal aromatic plants should be well known in order to benefit from them completely for our country's economy, ways to adopt them into our culture should be researched while their sectoral use should be determined based on their effective substances and the academic, technical knowledge and skills of people who carry out studies on the isolation of these effective substances should be increased [2]. Majority of the medicinal and aromatic plants are also rich in essential oils and have significant use in various sectors such as perfume, nutritional additives, cleaning products, cosmetics [7]. However, our medicinal aromatic plant flora is being damaged due to unplanned urbanization, illegal lumbering, forest fires, pollution due to industrial and domestic wastes, radiation emission, insensible use of pesticides, excessive grazing, collecting from nature and erosion and studies should be carried out for preventing this damage, reducing our dependence on foreign countries and for increasing the contributions to the country's economy in this field while also trying to ensure the sustainability of studies in this area.

In this study, twenty plants in Bingol with medicinal-aromatic were determined and photographed after which a brief information was provided regarding their intended use and properties and it was aimed to attract attention to the medicinal aromatic plant potential in Bingol. In addition, it is also stated that awareness and protection of this potential in our country and city along with decrease of our foreign dependency in herbal products despite this rich potential will make significant contributions to the economy of the country.

2. MATERIAL and METHOD

Twenty medicinal-aromatic plants [*Achillea biebersteinii* Afan., *Achillea millefolium* L. subsp. *annonica* (Scheele) Hayek., *Hypericum scabrum* L., *Lamium garganicum* L. subsp. *reniforme* (Montbret & Aucher) R.R. Mill., *Nepeta nuda* L. subsp. *nuda*, *Origanum acutidens* (Hand.-Mazz.) Letswaart, *Salvia multicaulis* Vahl., *Salvia palaestina* Benth., *Salvia verticillata* L. subsp. *verticillata*, *Salvia sclerae* L., *Salvia syriaca* L., *Stachys lavandulifolia* Vahl var. *brachydon* Boiss., *Scutellaria orientalis* L. subsp. *orientalis*, *Tanacetum densum* (Lab.) subsp. *amani* Heywood, *Tanacetum zahlbruckneri* (Nab.) Grierson, *Tanacetum parthenium* (L.) Sch. Bip., *Teucrium parviflorum* Schreb., *Teucrium multicaule* Montbret et Aucher ex Benth., *Mentha longifolia* (L.) Huds. subsp. *typhoides* (Briq.) Harley var. *typhoides*, *Thymus kotschyanus* Boiss. & Hohen. var. *kotschyanus*] were determined in the Bingöl city during the 2016 vegetation period and these plants were used material in this study. In addition, literatures were also used as sources of data. Plants were pressed in accordance with the herbarium technique following the keeping of locality and field records and "Flora of Turkey and the East Aegean Islands" [8] was used as the main reference for identification of these samples. After the identification procedures were completed, studied samples were deposited in Bingol University Park and Garden Plant Department. The plants locality information are: *Achillea biebersteinii*: Around Şaban village, steppe-rocky areas, 1750-1850 m. *Achillea millefolium* subsp. *annonica*: West of Dikme village, steppes-rocky areas, 1800-1850 m. *Hypericum scabrum*: around Haserek mountain, steppes and inclined areas, 1850-1950 m. *Lamium garganicum* subsp. *reniforme*: south of Yelesen village, rocky areas, 1600-1700 m. *Origanum acutidens*: around Aşağıköy exit and steppes, 1500-1600 m. *Nepeta nuda* subsp. *nuda*: south of Şaban village, steppes, 1300-1400 m. *Salvia multicaulis*: 3 km after Şaban village, side of the road and slopes, 1550-1600 m. *Salvia palaestina*: 3 km to Aşağıköy from Bingöl to the right of

the road, slopes and around *Quercus*, 1500-1600 m. *Thymus kotschyanus* var. *kotschyanus*: Towards Yelesen from Şaban village, slopes, 1600-1650 m. *Salvia syriaca*: North of Dikme plains, slopes, 1750-1800 m. *Scutellaria orientalis* subsp. *orientalis*: North of Yelesen village, slopes-rockies, 1650-1700 m. *Tanacetum zahlbruckneri*: upper areas of the Dikme plain, slopes, 1750-1850 m. *Teucrium parviflorum*: exit of Aşağıköy, towards Yelesen, left of the road, steppe, 1700-1750 m. *Tanacetum parthenium*: 5 km to Aşağıköy from Bingöl left of the road, along the river, 1500-1550 m. *Salvia verticillata* subsp. *verticillata*: North of Dikme village, forest clearance, 1700-1800 m. *Mentha longifolia* subsp. *typhoides* var. *typhoides*, West of Şaban village, towards Yelesen, right of the road, moist area, 1400-1500 m. *Teucrium multicaule*: 2nd km of the Çiriş village road, right of the road, slopes, 1600-1650 m. *Salvia sclerae*: West of Direkli village, Elazığ-Bingöl main road side of the forest, 1500-1600 m. *Stachys lavandulifolia* var. *brachydon*: West of Dikme village, steppes and rocky areas, 1750-1800 m. *Tanacetum densum* subsp. *amani*: North of Şaban village, rocky areas, 1700-1750 m.

3. RESULT and DISCUSSION

Many medicinal and aromatic plants can naturally be grown in our country due to its suitable ecological properties, majority of these can be collected directly from nature as is the case in many regions of the world whereas some are cultured. It is a known fact that the importance and industrial use of medicinal and aromatic plants are increasing every day. These plants are provided by way of collecting from nature in our country as well as partially from cultured plants. However, insensible collection of plants with medicinal, aromatic or economic value result in the disruption of the natural vegetation, extinction of rare, endemic and medicinal aromatic plants as well as the increase of erosion which is an important problem in our country [9]. Our country has a rich flora due to its geographical location, geomorphological structure, many different soil types and climate diversity and is among the top countries in terms of plant variety and diversity with studies indicating that our country is richer than Europe in terms of plant variety [10]. However, plants in the flora of our country and especially the medicinal aromatic ones are under various pressures thus many species face difficulties in continuing their existence. These are; industrialization and urbanization, land clearing and excessive grazing, tourism, export and domestic use, reclamation of arid, halophilous lands, agricultural pest control and pollution, afforestation and fires which cause damages in medicinal and aromatic plants as well. There is a small number of studies in literature on Bingol flora and especially on medicinal aromatic plants and recent studies carried out by the researchers of our university on the detection and analyses of various flora and medicinal aromatic plants along with the new plant species identified in Bingol [6] are indications of the number of plants in Bingol, its diversity and richness and as the number of such floristic studies as well as studies on medicinal aromatic plants increases, the richness of Bingol with regard to vegetation and especially medicinal aromatic plants will become clearer which will also contribute to the rural development of the region. In addition to a rich vegetation, intensive apiculture and animal rearing activities, natural beauties, various types of nature tourism (Plain-Flora-Winter-River-Hunting-Cave tourism areas, wildlife observation and trekking) are all indications of the special place of Bingol for our country. It was determined as a result of the study entitled the Flora of Dikme (Kür) plain (Bingol-center) and Its Environs that the Lamiaceae family members were among the most abundant plants in the region [6]. It is noteworthy with regard to studies on medicinal and aromatic plants that the Lamiaceae members are ranked high with regard to the number of plants in floristic studies carried out in Bingol. The Lamiaceae family which includes plants that are most frequently visited by bees is a family with plants that are mostly fine scented, annual or perennial, herbaceous and rarely bushy. Majority of the family members include medicinal, aromatic, scented plants and since these plants contain high amounts of essential and aromatic oils, they can be used in many areas such as raw materials for drugs, in

the cosmetic industry, they can be consumed as tea and they can also be used as decorative plants due to their fine scent and appearance. In addition to the Lamiaceae family, there are also other plant families with medicinal, aromatic and fragrant plants with many economically valuable plants which are found in the natural environment but which are yet to be cultured. Natural vegetation and especially medicinal aromatic plants should be better known in order to ensure the continuity of studies on plants with high economic value in our country and Bingol, necessary precautions should be taken to protect them from harm and the required sensitivity should be shown so that our dependence to foreign countries decreases and the income level of both our country and Bingol increases. These precautions can be listed as follows: continuity of incentives and support for increasing plant production via micro-cultivation in laboratory conditions in order to decrease the collection of medicinal aromatic plants from nature. Significant contributions will be made to our country's economy as studies are continued within the scope of the project for the development of perfumery and medicinal plants and dye plants which are currently in application at Bingol as well as in many different cities, our dependence on foreign countries will decrease, collection from nature will decrease and hence especially medicinal, fine scented plants will be able to spread further in nature thereby leading us to understand the importance of this and similar studies. We can all show the required sensitivity by placing greater emphasis on our national, conscientious and humane responsibility by increasing studies on the cultivation of medicinal aromatic plants in culture areas, benefiting from the knowledge of experts in the field, continuing organizations such as workshops, conferences and scientific studies. Cultivation studies should be carried out by taking into consideration the secondary substance content of species as well as research results on their genetics and heredity and they should be carried out firstly at ecologic conditions where they are naturally grown. Hence; higher yield will be obtained from unit area, thereby obtaining pure, clean drugs that are in accordance with standards. The market volumes of medicinal and aromatic plants continue to increase parallel to their use in different areas and fields of industry. The number of plants that are currently collected from nature and produced is still very low despite the fact that our country has a rich source of medicinal aromatic plants. The increase of medicinal and aromatic plant cultivation in our country can be attained in addition to the development of many relevant branches of industry in a short period of time by taking the necessary precautions.

4. CONCLUSION

Many medicinal and aromatic plants are collected from nature in our country and some of them are cultivated to some extent. However, there are no regular statistical data on these and cultivation is not carried out based on the relationship between supply-demand. Data banks should be formed from where information related with these plants can be accessed. In addition, local consumption and foreign trade data should be taken into consideration for medicinal and aromatic plants for determining how much should be collected from which plant in nature and how much should be cultivated. It will be beneficial to establish an interdisciplinary committee that will provide information on which plants should be cultivated in addition to the supply-demand situation in the global market as well as prices. Annual imports worth millions of dollars will thus be decreased to some extent and significant income will be provided both to the local public and our country's economy by cultivating and exporting the medicinal and aromatic plants determined in the natural environment of our country and our city.

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Conflict of Interests

Authors declare that there is no conflict of interests.

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