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The Aromatic-Medicinal Plant Taxa of pure Scots pine stands in Sürmene - Camburnu (Trabzon)

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Abstract: Forests not only produce wood raw material ecosystems, but also that have rich medicinal and aromatic plants. In addition to this situation, forests have been produced many goods and services. Regulation of protection-utilization balance with wood and non-wood herbal products is very important to these ecosystems. In order to ensure sustainable utilization of forest ecosystems, first of all, it is necessary to identify the natural resource components in these ecosystems. In this study, medicinal-aromatic plants of natural Scots pine (*Pinus sylvestris* L.) stands, which are a sensitive ecosystem, were investigated in 2013-2014. *Pinus sylvestris* has special ecological conditions in Sürmene-Çamburnu (Trabzon) region because in this region *Pinus sylvestris* is descending down to the beach. In the study, 81 (77%) out of 105 vascular plant taxa were found to have medicinal-aromatic potential. The parts of the identified plant taxa used for different medical and aromatic purposes are explained in detail. In addition, recommendations were made about regulation of utilization in sensitive ecosystems.

Keywords: Pinewood, medicinal-aromatic plant, flora

1. INTRODUCTION

Forests are the ecosystems that produce not only wood raw material but as well non-wood forest products. In the one hand forest ecosystem serves the products which meet the needs of people directly or indirectly, on the other hand it contains the rich plant diversity. One of the well-known of products of forests are medicinal and aromatic plants. Briefly, forests have produced many goods and services. The continuity of forest functions such as conserving biodiversity and utilization are important. Conservation and utilization equilibrium with wood and non-wood plant products is very important to these ecosystems. In order to ensure sustainable utilization of forest ecosystems, first of all, it is necessary to identify the natural resource components in their habitats. Ethnobotanical studies have been tried to determine these potentials. Ethnobotanical science was born from the relationships between people and plants [1]. People have been using wild plants since 50,000 years in Anatolia [2]. Because of its rich cultural and biological diversity, Turkey is an important center for ethnobotanical researches

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[3]. Local people in Anatolia have benefited from medicinal and aromatic plants for many years. But these uses are not scientifically well supported. From this point of view, multidisciplinary (ie, botanist, chemist, medical experts) studies on the aromatic-medicinal plants should be conducted.

Depending on the health problem of processed food, natural products are getting worth to attention day by day. Natural forest ecosystems of Anatolia are rich in such kind of native vascular plant products including ethnomed,cinal plant taxa. In Turkey, these plants have not been used enough because of lack of inventory data of these taxa.

In this study, medicinal-aromatic plants of natural Scots pine (*Pinus sylvestris* L.) stands, which are a sensitive ecosystem in Sürmene-Çamburnu (Trabzon-Turkey), were investigated. *Pinus sylvestris* has special ecological conditions in the study area where starts its natural distribution from Sea level. The parts of identified vascular plant taxa which have been used for the medical-aromatic purposes are explained in detail. In addition, recommendations were made about regulation of utilization in sensitive ecosystems.

2. MATERIAL and METHODS

The floristic structure of the research area was investigated between February to November in the years 2013 and 2014. Within the scope of the study, plants from the research area were collected from the study area, identified and kept at the herbarium KATO (Herbarium of Karadeniz Technical University Faculty of Forestry). The plant taxa which particularly have medicinal and aromatic significance were determined. As a result of detailed literature study, the listed taxa were found out that they worth to use for medicinal-aromatic purposes.

3. RESULTS and DISCUSSIONS

In the present study, 81 (77%) out of 105 taxa were found as medicinal and aromatic vascular plants. They were listed in Table 1 together with their families, used parts, usages and references.

Table 1. Medicinal and aromatic vascular plant taxa together with their families, used parts, usages and references.

Family	Plant Taxa	Used part(s)	Usage	Ref.
Araliaceae	*Hedera helix*	Leaves, berries	The homeopathic preparations are indicated in diseases of the respiratory tract, gastrointestinal tract, rheumatic diseases and hyperthyroidism. Hedera leaves are also used in gout, rheumatism and externally against parasites	[4][5][6] [7]
Asteraceae	*Centaurea jacea*	Leaves, flowers, body	Folk medicinal use to treat abcesses, hemorrhoids, peptic ulcers and the common cold	[8] [9]
Asteraceae	*Eupatorium cannabinum*	Aerial parts	Ethanolic extract against colon cancer cells	[10]
Asteraceae	*Lapsana communis subsp. grandiflora*	Young leaves, shoots	Having a calming and antiseptic effect	[11]
Asteraceae	*Taraxacum stevenii*	Whole plant	Eye diseases	[12]
Asteraceae	*Taraxacum scaturiginosum*	Capitulum, stem leaf	Anti- inflammatory, genital itching	[13]
Asteraceae	*Tussilago farfara*	Aerial part, capitulum, leaf	Foot ache, cough, expectorant	[13]

Continuation of Table 1.

Berberidaceae	*Epimedium pinnatum*	Whole plant	Antioxidant and antimicrobial	[14]
Berberidaceae	*Epimedium pubigerum*	Aerial parts	Epimedium contains icariin, which has demonstrated in vitro PDE5 inhibitory properties	[15]
Boraginaceae	*Omphalodes cappadocica*	Whole plant	Antimicrobial activity	[16]
Boraginaceae	*Trachystemon orientalis*	Leaves, petiols, stems	Traditional medicine for human treatments	[17] [18]
Campanulaceae	*Campanula latifolia*	Flowers, leaves, root	Contains up to 400mg % of vitamin C	[19]
Campanulaceae	*Campanula rapunculoides*	Leaves, young shoots	The plant has been used as a cure for hydrophobia in Russia.	[20]
Caprifoliaceae	*Sambucus ebulus*	Leaves, fruit	Wounds, hurts Hemorrhoids Stomachache	[13]
Chenopodiaceae	*Atriplex nitens*	Whole plant	Anticancer and Antioxidant activity	[21]
Cistaceae	*Cistus salviifolius*	Whole plant	As sedative and expectorant	[22]
Cruciferae	*Bunias orientalis*	Aerial parts	Raw plant material for a higher exposure to bioactive phytochemicals such as glucosinolates, their hydrolysis products, and also phenolics, flavonoids, and vitamins such as vitamin C	[23]
Cruciferae	*Cardamine impatiens*	Whole plant	Nervous diseases	[24]
Cruciferae	*Raphanus raphanistrum*	Leaves	Treatment of obesity	[25]
Cuscutaceae	*Cuscuta campestris*	Whole plant	Purgative, constipation	[26]
Cypraceae	*Cyperus longus*	Aerial parts	Decreasing hair growth	[27]
Dennstaedtiaceae	*Pteridium aquilinum*	Rhizomes, leaves	Both bracken rhizomes were used in folk medicine	[28]
Dipsacaceae	*Succisa pratensis*	Root	Use a decoction made from the rootstock to treat coughs, sore throat, bronchitis, fever and internal inflammation.	[29]
Droseraceae	*Drosera rotundifolia*	Whole plant	Various breathing problems	[30]
Euphorbiaceae	*Euphorbia paralias*	Whole plant	Has potent antifungal activity that is capable of treating Dermatophytic infection in vivo	[31]
Euphorbiaceae	*Euphorbia amygdaloides*	Whole plant	Use to fight infections, warts and freckles.	[32]
Ericaceae	*Arbutus unedo*	Root	Antimicrobial activity	[33]
	Calluna vulgaris	Aerial parts	Skin cancer	[34]

Continuation of Table 1.

Ericaceae	*Erica arborea*	The flowering tips	Renal lithiasis, used in a decoction as a diuretic and a urinary antiseptic	[35]
Ericaceae	*Rhododendron x sochadzeae*	Leaves	Analgesic effect	[36]
Ericaceae	*Rhododendron luteum*	Whole plant	Toxic, but also has medicinal uses.	[37] [38] [39]
Ericaceae	*Vaccinium arctostophyllos*	Berries	Therapeutic effects	[40] [41]
Fagaceae	*Castanea sativa*	Seed, leaves	Diet and therapy	[42]
Fagaceae	*Quercus hartwissiana*	Leaves	Traditional medicine for human treatments	[43]
Gentianaceae	*Centaurium pulchellum*	The whole flowering and fruiting herb	A decoction is used for gastric and abdominal pain, hypertention, renal colic, rheumatic pains and for the elimination of stones from the kidney and urethera. An infusion of the herb is used for diabetes.	[44] [45] [46]
Geraniaceae	*Erodium cicutarium*	Herb	For hemorrhoids	[47]
Gramineae	*Echinochloa crus-galli*	Mature plants	Herbicide sprey	[48]
Gramineae	*Paspalum paspalodes*	Toxic plant	Tremorgenic mycotoxicosis	[49]
Gramineae	*Setaria glauca*	Nuisance weed	Cause stomatitis in cattle and horses	[50]
Grossulariaceae	*Ribes biebersteinii*	Fruit	Against anemia	[47]
Guttiferae	*Hypericum tetrapterum*	Whole plant	Antimicrobial and antioxidant activities of the essential oil	[51]
Iridaceae	*Iris lazica*	The juice of the fresh roots	Cosmetic and for the removal of freckles from the skin.	[52]
Lamiaceae	*Ajuga reptans*	Mature leaves or storage organs	Carbohlydrate components for traditional medicine	[53]
Lamiaceae	*Lamium maculatum var. maculatum*	Aerial parts	Used in the Chinese Folk Medicine for treatment of Trauma, fracture and hypertension	[54] [55]
Lamiaceae	*Lycopus europaeus*	whole herb	An ayurvedic medicine which is used as anti-inflammatory agent.	[56]
Lamiaceae	*Origanum vulgare subsp. vulgare*	Aerial parts	The aqueous extract for embryo development.	[57]

Continuation of Table 1.

Lamiaceae	*Prunella vulgaris*	Dried fruit-spikes	Traditional Chinese medicine its water extract for therapeutic use is prepared from the dried fruit-spikes of medicine that has been used for the treatment of headache, dizziness due to hypertension, tinnitus, conjunctivitis, dry cough, dermatitis and boils, high blood pressure and skin allergic diseases.	[58] [59] [60]
Leguminosae	*Genista tinctoria*	Aerial parts	Use to treat tobacco addiction	[61]
Leguminosae	*Vicia peregrina*	Seed	Diets	[62]
Leguminosae	*Medicago lupulina*	Aerial parts	Antibacterial properties against micro-organisms	[63]
Leguminosae	*Melilotus alba*	Aerial parts	Extracts for antibacterial and antitumor activities	[64]
Leguminosae	*Robinia pseudoacacia*	Flowers	Antioxidant	[65]
Liliaceae	*Ornithogalum sigmoideum*	Leaves	Play a major role in initiating thrombus formation which occurrs with various thrombotic disorders, including hypertension, atherosclerosis and ischemic heart diseases.	[66]
Loranthaceae	*Viscum album subsp. austriacum*	Whole plant	Herbal preparations are traditionally used in two main therapeutic areas for cardiovascular disorders and in oncology	[67]
Lythraceae	*Lythrum salicaria*	The dried herbal parts	Has a wide range of beneficial health effects. Its pharmacological activity is mostly due to its phenolic compounds, mainly tannins.	[68]
Oleaceae	*Osmanthus decorus*	Leaves	Herbal drug	[69]
Osmundaceae	*Osmunda regalis*	Rhizome	For the treatment of bone fractures, joint disorders and rheumatic and arthritic pain	[70]

Continuation of Table 1.

Primulaceae	*Anagalis arvensis var. caerulea*	Whole plant	Used for depression, tuberculosis, liver complaints, epilepsy, dropsy, and rheumatism. Externally extract of this species used for improving the complexion, especially for freckles.	[71]
Primulaceae	*Pirimula megaseifolia*	Whole plant	Traditional medicine for human treatments	[72]
Primulaceae	*Primula vulgaris*	Leaves, roots	Human Pathogenic Bacterial Strains	[73]
Polygonaceae	*Rumex acetosella*	Leaves	Diabetes, stomach and heart diseaes	[74]
Polypodiaceae	*Polypodium vulgare subsp. vulgare*	Rhizomes	Herbal preparations in solid dosage forms for oral use	[75]
Polypodiaceae	*Blechnum spicant*	Leaflets, fronds, root	The leaflets have been chewed in the treatment of internal cancer, lung disorders and stomach problems. The fronds are used externally as a medicine for skin sores. A decoction of the root has been used in the treatment of diarrhoea.	[76]
Ranunculaceae	*Ranunculus ficaria subsp. bulbifera*	Leaves	Used for wound healing and hemorrhoids	[77] [78] [79] [80]
Rhamnaceae	*Frangula alnus*	Bark, branches	Treatment of headaches Dried, whole or fragmented bark of the stems and branches, standardised; standardised herbal preparations thereof	[81] [82]
Rosaceae	*Aruncus vulgaris*	Fresh aerial parts	Traditional medicine for human treatments	[83]
Rosaceae	*Fragaria vesca*	Strawberry	Antioxidant	[84]
Rosaceae	*Laurocerasus officinalis*	Fruit	Antioxidant	[85]
Rosaceae	*Potentilla reptans*	Aerial parts	Traditional medicine for human treatments	[86]
Rosaceae	*Rosa canina*	Aerial parts	İs used for the prevention and treatment of the common cold, gastrointestinal disorders, diabetes, kidney disorders, and other infections	[87]
Rosaceae	*Rubus idaeus*	Fruit	Use of raspberry as a cure for renal diseases in Chinese traditional medical practice.	[88]

Continuation of Table 1.

Rosaceae	*Rubus platyphyllos*	Fruit	Antioxidant	[88]
Rosaceae	*Rubus caucasicus*	Fruit	Antioxidant	[88]
Scrophulariaceae	*Veronica persica*	Aerial parts	Pharmacological activity	[89]
Smilacaceae	*Smilax excelsa*	Fruit	Used in Chinese traditional system of medicines as anticancer, anti-inflammatory and analgesic agents	[90]
Solanaceae	*Solanum dulcamara*	Bark of the root, twigs	Use it as a poultice for gout, herpes, furuncles, warts, ringworms, shingles, old ulcers, and felons	[91]
Thymelaeaceae	*Daphne pontica*	Aerial Parts, roots	Traditional medicine for human Treatments	[92]
Umbelliferae	*Angelica sylvestris*	Leaves	Antioxidant	[93]
Umbelliferae	*Hydrocotyle ramiflora*	Aerial Parts	Antioxidant	[94]
Urticaceae	*Urtica dioica*	Leaves, herb, seed	Against goiter, hemorrhoids, urinary system infections, stomach disorders, dyspnea, bronchitis, hypertension, infertility (for women); as analgesic Against cancer, stomachache, gastric ulcer, goiter.	[47]
Violaceae	*Viola suavis*	Aerial Parts	Treatments for colds and bronchitis	[95]

Aromatic and medicinal plants have a significant role in human health. These roles have been resulted mainly from their different chemical contents. Different parts of them such as leaf, bark, root, seed, fruit and flower has been used for these purposes. Traditional usages of these plants are important in projection of discovery new drugs.

As a result of the developments in agricultural techniques using of wild plants was remarkably decreased [96]. Many of vascular plant taxa have nutritionally importance and they can be used as medicine. They have been used alternatively for the poverty problems as well [97]. Therefore, determining chemical contents of wild vascular plant taxa is important in order to use them as medicine. So, ethno medicinal uses of the identified plant taxa have been reported in the present study. In the present study, 81 (77%) out of 105 vascular plant taxa were found to have medicinal and aromatic potential. The parts of these plant taxa, which have been identified, used for different purposes are explained in detail.

4. CONCLUSION

A great variety of vascular plants was used by traditional healers for treatment of some diseases. Protective measures are necessary for the conservation of the natural herbal resources, because of avoiding their overexploitation. Unfortunately, local people are fast losing some of their most important traditional using of valuable wild plant species. It is important that we collect and record information as soon as possible. The present study also showed that medicinal plants continue to play an important role in the primary healthcare system. Fresh part of the plant is used for the preparation of the medicine but if fresh plant parts are not suitable in that moment dried parts of plant can be used.

Pinus sylvestris has special ecological conditions in Sürmene-Çamburnu (Trabzon) region, because of its unexpected distribution here. In the NE Anatolia the distribution of *Pinus*

sylvestris is descending down to the beach. This forest is a sensitive ecosystem which has fragile structure. Because of its floristic contents and vegetation structure this Scots pine forest is a unique ecosystem that it is assignment as Nature Park. For this reason, we need to consider the conservation and utilization equilibrium while using the plant species in this kind of areas. With this study, we believe that we will contribute to future ethnobatanical and ethnomedicinal studies.

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This study is a part of PhD thesis of corresponding author.

Conflict of Interests

Authors declare that there is no conflict of interests.

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