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

Arzu ERGÜL BOZKURT *1, Salih TERZİOĞLU2

1Artvin Çoruh University, Faculty of Forestry, Artvin, Turkey
2Karadeniz Technical University, Faculty of Forestry, Trabzon, Turkey

Received: 04 May 2017 – Revised: 21 September 2017 - Accepted: 03 November 2017

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.

*Corresponding Author E-mail: ergul_arzu@yahoo.com

ISSN: 2148-6905 online /© 2017 DOI: 10.21448/ijsm.377774
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 ethnomedical 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 shoots, leaves      | 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.

| Family            | Genus             | Plant Part | Activity/Use                                      | Reference |
|-------------------|-------------------|------------|--------------------------------------------------|-----------|
| Berberidaceae     | Epimedium         | Whole plant| Antioxidant and antimicrobial                      | [14]      |
| Berberidaceae     | Epimedium         | Aerial part| Epimedium contains icariin, which has demonstrated in vitro PDE5 inhibitory properties | [15]      |
| Boraginaceae      | Omphalodes        | Whole plant| Antimicrobial activity                             | [16]      |
| Boraginaceae      | Trachystemon      | Leaves, petiols, stems| Traditional medicine for human treatments | [17] [18] |
| Campanulaceae     | Campanula         | Flowers, leaves, root| Contains up to 400mg % of vitamin C | [19]      |
| Campanulaceae     | Campanula         | Leaves, young shoots| The plant has been used as a cure for hydrophobia in Russia. | [20]      |
| Caprifoliaceae    | Sambucus          | Leaves, fruit| Wounds, hurts Hemorrhoids Stomachache         | [13]      |
| Chenopodiaceae    | Artriplex         | Whole plant| Anticancer and Antioxidant activity               | [21]      |
| Cistaceae         | Cistus            | 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         | Whole plant| Nervous diseases                                  | [24]      |
| Cruciferae        | Raphanus          | Leaves     | Treatment of obesity                              | [25]      |
| Cuscutaceae       | Cuscuta           | Whole plant| Purgative, constipation                           | [26]      |
| Cypraceae         | Cyperus longus    | Aerial part| Decreasing hair growth                            | [27]      |
| Dennstaedtiaceae  | Pteridium         | Rhizomes, leaves| Both bracken rhizomes were used in folk medicine  | [28]      |
| Dipsacaceae       | Succisa           | Root       | Use a decoction made from the rootstock to treat coughs, sore throat, bronchitis, fever and internal inflammation. | [29]      |
| Droseraceae       | Drosera           | Whole plant| Various breathing problems                        | [30]      |
| Euphorbiaceae     | Euphorbia         | 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]      |
| Ericaceae         | Calluna vulgaris  | Aerial part| Skin cancer                                       | [34]      |
Continuation of Table 1.

| Family        | Species                          | Part Used                     | Uses                                                                 | References |
|---------------|----------------------------------|-------------------------------|----------------------------------------------------------------------|------------|
| 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]  |
| Ericaceae     | *Vaccinium arctostaphylos*       | 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, hypertension, 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]  |
| 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 | Carbohydrate 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.

| Family          | Genus                  | Part       | Use/Activity                                                                 | Reference(s) |
|-----------------|------------------------|------------|-----------------------------------------------------------------------------|--------------|
| Lamiaceae       | *Prunella vulgaris*    | Dried fruit-spikes | Traditional Chinese medicine and 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 albus*      | 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 occurs 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.

| Family         | Genus                      | Part/Part(s)   | Use                                       | Reference(s) |
|----------------|----------------------------|----------------|-------------------------------------------|---------------|
| 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 aceto
tella*        | Leaves         | Diabetes, stomach and heart diseases       | [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                     | [81], [82]   |
| Rosaceae       | *Aruncus vulgaris*         | Fresh aerial parts | Traditional medicine for human treatments | [83]          |
| Rosaceae       | *Fragaria vesca*           | Strawberry     | Antioxidant                                | [84]          |
| Rosaceae       | *Laurocerasus officinalis Potentilla reptans* | Fruit | Antioxidant                                | [85]          |
| Rosaceae       | *Rosa canina*              | Aerial parts   | Traditional medicine for human treatments | [86]          |
| Rosaceae       | *Rubus idaeus*             | Fruit          | Use of raspberry as a cure for renal diseases in Chinese traditional medical practice. | [88]          |
Continuation of Table 1.

| Family           | Genus                  | Part       | Use/Activity                                           | Reference |
|------------------|------------------------|------------|--------------------------------------------------------|-----------|
| 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 felon | [91]      |
| Thymelaeaceae    | Daphne pontica         | Aerial Parts | 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, urinal 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 ethnobatonical and ethnomedicinal studies.

Acknowledgement

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

Conflict of Interests

Authors declare that there is no conflict of interests.

5. REFERENCES

[1] Koçyiğit, M. (2005). Yalova İlinde Etnobotanik Bir Araştırma, Yüksek Lisans Tezi, İstanbul Üniversitesi Sağlıklı Bilimleri Enstitüsü.

[2] Baytop, T. (1994). Türkçe Bitki Adları Sözlüğü. Atatürk Kültür, Dil ve Tarih Yüksek Kurumu, Türk Dil Kurumu Yayınları, ISBN: 975-16-0542-3, No:578, 508 s., Ankara.

[3] Özkan, Z.C. & Akbulut, S. (2012). Trabzon İlinin Etnobotanik Özellikleri. KTU BAP, Proje No:1098, Trabzon.

[4] European Medicines Agency, Science Medicines Health (2011). EMA/HMPC/289432/2009 Committee on Herbal Medicinal Products (HMPC), Assessment report on *Hedera helix* L., *folium*.

[5] Gruenwald, J., Brendler, T., Jaenicke, C. (2000). PDR for Herbal Medicines. Medical Economics Company, Montvale, 284-5. 3.

[6] Blumenthal, M. Herbal Medicine Expanded Commission E. Monographs (2000). 1st ed. Austin, 215-218.

[7] Lutsenko, Y., Bylka, W., Matławska, I., & Darmohray, R. (2010). *Hedera helix* as a medicinal plant, kerva polonica, Vol 56, No 1.

[8] Sezik, E., Yesiладea, E., Honda, G., Takaishi, Y., Takeda, Y., Tanaka, T. (2001). Traditional medicine in Turkey X. Folk medicine in Central Anatolia. *J. Ethnopharmacol.* 75:95-115.

[9] Kilic, O. (2013). Essential oil compounds of three Centaurea L. taxa from Turkey and their chemotaxonomy, *Journal of Medicinal Plants Research*, Vol. 7(19), pp. 1344-1350, DOI: 10.5897/JMPR12.1233, ISSN 1996-0875.

[10] Ribeiro-Varandas, E., Ressurreição, F., Viegas, W. & Delgado, M. (2014). Cytotoxicity of *Eupatorium cannabinum* L. Ethanolic extract against colon cancer cells and interactions with Bisphenol A and Doxorubicin. BMC Complement Altern Med. doi: 10.1186/1472-6882-14-264.

[11] URL 1. 13.02.2017, www.luontoportti.com › Plants › Flowers.

[12] Altundaga, E. & Ozturk, M. (2011). Ethnomedicinal studies on the plant resources of east Anatolia, Turkey, The 2nd International Geography Symposium GEOMED2010, ELSEVIER, ScienceDirect, Procedia Social and Behavioral Sciences 19, 756–777.

[13] Kızılarslan, Ç. & Özhatay, N. (2012). Wild Plants Used as Medicinal Purpose in the South Part Of İzmit (Northwest Turkey), Original article, *Turk J. Pharm. Sci.*, 9(2), 199-218.

[14] Mahboubi, M., Kazempour, N., Hosseini, H. & Mahboubi, M. (2013). Antimicrobial and antioxidant activity of *Epimedium pinnatum*, Experimental Paper, kerva polonica, Vol. 59 No. 2 DOI: 10.2478/hepo-2013-0009.
[15] URL 2. 03.12.2016, https://en.wikipedia.org/wiki/Epimedium.

[16] İskender, Y., Kahriman, N., Yücel, M., Alpay, Karaağaçlı, Ş., Terzioğlu, S., Yaylı, N. (2011). Antimicrobial activity and Volatile Constituents of *Omphalodes cappadocica* (Wild.) DC., *Asian Journal of Chemistry*, Vol.23, Pp.1032-1034.

[17] Akçin, Ö.E., Kandemir, N. & Akçin, Y. (2004). A Morphological and Anatomical Study on a Medicinal and Edible Plant *Trachystemon orientalis* (L.) G.Don ( Boraginaceae ) in the Black Sea Region, *Turk J Bot*, 28, 435-442.

[18] Doğru-Koca, A. & Yıldırımli, Ş. (2010). Ethnobotanical Properties of Akçakoca District in Düzce (Turkey), *Hacettepe J. Biol. & Chem.*, 38 (1), 63-69.

[19] URL 3. 11.07.2016. http://www.pfaf.org/user/plant.aspx?latinname=Campanula+latifolia.

[20] URL 4. 03.05.2016. http://www.naturalmedicinalherbs.net/herbs.

[21] Aboul-Enein, A.M., Abu El-Ela, F., Shalaby, E.A. & El-Shemy, H.A. (2012). Traditional medicinal plants research in Egypt: Studies of antioxidant and anticancer activities, *Full Length Research Paper, Journal of Medicinal Plants Research* Vol. 6(5), pp. 689-703, DOI: 10.5897/JMPR11.968 ISSN 1996-0875.

[22] Koçyiğit, M. & Özhatay, N. (2006). Wild Plants Used as Medicinal Purpose in Yalova (Northwest Turkey), *Turkish J. Pharm. Sci.*, 3 (2), 91-103.

[23] URL 5. 01.12.2016. http://pubs.acs.org/doi/abs/10.1021/jf052756t.

[24] Pande, PC., Tiwari, L. & Pande, HC. (2007). Ethnoveterinary plants of Uttaranchal - A Review, *Indian Journal of Traditional Knowledge*, Vol. 6 (3), pp. 444-458.

[25] Conforti, F., Perri, V., Menichini, F., Marrelli, M., Uzunov, D., Statti, G.A. & Menichini, F. (2011). Wild Mediterranean Dietary Plants as Inhibitors of Pancreatic Lipase, Phytotherapy Research Phytother. Published online in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/ptr.3603.

[26] Youssef, R.S.A. (2013). Medicinal and non-medicinal uses of some plants found in the middle region of Saudi Arabia, *Full Length Research Paper, Journal of Medicinal Plants Research*, Vol. 7(34), pp. 2501-2513, DOI: 10.5897/JMPR12.798, ISSN 1996-0875.

[27] AbouZid, S.F. & Mohamed, A.A. (2011). Survey on medicinal plants and spices used in Beni-Sueif, Upper Egypt, *Journal of Ethnobiology and Ethnomedicine*, Page 2 of 6.

[28] Madeja, J., Harmata, K., Kołaczek, P., Karpińska-Kołaczek, M., Piątek, K. & Naks, P. (2009). Bracken (*Pteridium aquilinum*(L.) Kuhn), mistletoe (*Viscum album* (L.)) and bladder-nut (*Staphylea pinnata* (L.)) - mysterious plants with unusual applications. Cultural and ethnobotanical studies, Plants and Culture: seeds of the cultural heritage of Europe, Edipuglia s.r.l. - www.edipuglia.it.

[29] URL6.21.11.2016.https://www.herbal-supplement-resource.com/devils-bit-scabious.html.

[30] URL 7. 11.11.2016. http://www.webmd.com/vitamins-supplements.

[31] Berfad, M.A., Alnour, T.M.S. & Shakurfow, F. A. (2013). Treatment of Two Cases of Tinea capitis by Euphorbia paralias Matrix (Case Study), *Journal of Medicinal Plants Studies*, Volume: 1, Issue: 3 First page: (87) Last page: (90) ISSN: 2320-3862.

[32] URL 8. 02.02.2017. http:// titan-medicalplant.blogspot.com.tr/2011/11/wood-spurge. html.

[33] Dib, M.A., Djabou, N., Allali, H. & Tabti, B. (2010). Identification of Phenolic Compounds and Antimicrobial Activity of Roots of *Arbutus unedo* L., *Asian Journal of Chemistry*, Vol. 22, No. 5, 4045-4053.
[34] IUCN (2005). A Guide to Medicinal Plants in North Afrika, Cover Design by: Chadi Abi Faraj. Produced by: IUCN Centre for Mediterranean Cooperation, ISBN: 2-8317-0893-1, A Guide to Medicinal Plants in North Africa (Malaga, Spain).

[36] Mohajje-Nayebi, A., Nazemiyeh, H., Omidbakhsh, R. & Çobanoglu, S. (2008). Analgesic effect of the methanol extract of Erica arborea (L.) in mice using formalin test, DARU Vol. 16, No. 4.

[37] Alan, S., Kürkcücögolu, M., Göger, F., Can-Başer, H.K. (2010). Morphological, chemical and indumentum characteristics of Rhododendron luteum Sweet (Ericaceae). Pak. J. Bot., 42(6), 3729-3737.

[38] Parfionov, W.I. (1987). Po Stronicam Krasnoy Knigi. Bielorusskaya Sovietskaya Enciklopedia, Minsk.

[39] Marin, C., Cantor, M., Szatmarı, P. & Sıcora, C. (2014). Rhododendron luteum Sweet. and Rhododendron hirsutum L. in Habitats from Central Europe, Bioflux, ProEnvironment, 7, 165 - 172.

[40] Amin, G. (1991). Popular Medicinal Plants of Iran, Vol. 1. Tehran, Research Deputy of Health Ministry, p. 126.

[41] Nickavar, B. & Amin G. (2004). Anthocyanins from Vaccinium arctostaphylos Berries, Pharmaceutical Biology, Vol. 42, Nos. 4-5, pp. 289-291.

[42] Živković, J., Mujić, I., Zeković, Z., Nikolić, G., Vidović, S. & Muijić, A. (2009). Extraction and Analysis Of Condensed Tannins In Castanea Sativa Mill., Ekstrakcija I Analiza Kondenziranih Tannina Castanea Sativa Mul., Original Paper, Journal Central European Agriculture, 10(3), 283-288.

[43] Kaya, M., Cenesiz, M., Onder, F., Ucar, Ö., Uzun, M. & Yıldız, S. (2006). GnRH-Induced LH Secretion in Prepubertal female fat-tailed Lambs fed with tannin-rich Oak Leaves (Quercus hartwissiana), Revue Méd. Vét., 157, 7, 387-390.

[44] Britton, N.L. & Brown, H.A. (1970). An illustrated Flora of the Northern United States and Canada. Vol. III. Dover Publ. Inc., New York.

[45] Rizk, A.M. & El-Ghazaly, G.A. (1995). Medicinal and Poisonous Plants of Qatar University of Qatar, Doha.

[46] URL 9. 11.11.2015. http://www.uicnmed.org/nabp/web/documents/book/chapter3.pdf.

[47] Özgen, U., Kaya, Y. & Houghton, P. (2010). Folk medicines in the villages of Ilıca District (Erzurum, Turkey), Turk J Biol, 36, 93-106, doi:10.3906/biy-1009-124.

[48] Maun, M.A. & Barret, S.C.H. (1986). The biology of Canadian weeds. Echinocchioa crus-galli L. Beauv. Can. J. Plant Sci., 66, 739-759.

[49] Moyano, M.R., Molina, A.M., Lora, A.J., Mendez, J. & Rueda, A. (2010). Tremorgenic mycotoxicosis caused by Paspalum paspaloides (Michx.) Scribner infected by Claviceps paspali: a case report, Case Report, Veterinarini Medicina, 55, 336–338.

[50] Steel-Marion, G., Cavers-Paul, B. & Lee-Susanne M. (1983). The Biology of Canadian Weeds. 59. Setaria glauca (L.) Beauv. and S. verticillats (L.) Beauv., Can. J. Plant Sci., 63, 711-725.

[51] Dordević, A., Šmelcerović, A., Veličković, D., Stankov-Jovanović, V., Mitić, V., Kostić, D. & Palić, R. (2010). Antimicrobial and antioxidant activities of essential oil and crude extracts of Hypericum tetrapterum Fries (Hypericaceae), Vol.4(14), 1441-1445, DOI: 10.5897/IMPR10.116, ISSN: 1996-0875.

[52] URL 10. 21.03.2016, http://www.botanical.com/botanical/mgmh/i/irises08.html#med.
[53] Bachmann, M., Matile, P., & Keller, F. (1994). Metabolism of the Raffinose Family Oligosaccharides in Leaves of Ajuga reptans. Cold Acclimation, Translocation, and Sink to Source Transition: Discovery of Chain Elongation Enzyme. *Plant Physiol.*, 105, 1335-1345.

[54] Shuya, C., Xingguo, C., & Zhide, H. (2003). Biomed. Chromatogr. Biochem. Syst. Ecol., 28, 891.

[55] Alipieva, K.I., Taskova, R.M., Jensen, S.R., & Handjieva, N.V. (2006). Iridoid glucosides from Lahirum album and Lamium maculatum (Lamiaceae), ELSEVIER, *Biochemical Systematics and Ecology*, 34, 88-91.

[56] Aziz, A., Hussain, M., Raza, S.M., Khan, I.A., Munawar, S.H., Manzoor, Z., & Saleem, M. (2014). In vitro anti-inflammatory activity of Lycopus europaeus Linn., *International Journal of Pharma Sciences*, Vol. 4, No. 4, 689-691.

[57] Benavides, V., D’Arrigo, G. & Pino J. (2010). Effects of aqueous extract of Origanum vulgare L. (Lamiaceae) on the preimplantational mouse embryos, Efecto del extracto acuoso de Origanum vulgare L. (Lamiaceae) en embrones preimplantacionales de ratón, *Rev. peru. biol*. 17(3): 381 - 384, *Facultad de Ciencias Biológicas* UNMSM, ISSN: 1727-9933.

[58] World Health Organization (1989). WHO Regional Publications, Western Pacific Series No.2, Medicinal Plants in China – A selection of 150 commonly used species., P. 231.

[59] Shin, T.Y., Kim, Y.K, Kim, H.M. (2001). Inhibition of Immediate-type allergic reactions by Prunella vulgaris in a murine model, *Immunopharmacol Immunotoxicol*, 23(3), 423-35.

[60] Cheng, C-L. & Xu, H. (2006). Antiviral and Immunomodulatory Properties of *Prunella vulgaris*, *Asian Journal of Traditional Medicines*, 1-5.

[61] Tero-Vescan, A., Varı, C.E. & Vlase, L. (2014). Alkaloid Content Of Some Potential Isoflavonoids Sources (NATIVE Genista Species) Long-Term Safety Implications, *Farmacía*, Vol. 62, 6.

[62] Buyukcapar, H.M. & Kamalak, A. (2006). Raw and heat-treated culban (Vicia peregrina) seed as protein source for mirror carp (Cyprinus carpio) fingerlings, *South African Journal of Animal Science*, 36 (4).

[63] URL 11. 21.11.2016. www.naturalmedicinalherbs.net/herbs/m/medicago-lupulina.

[64] Pehlivan-Karakaş F., Yıldırım, A., & Türker, A. (2012). Biological screening of various medicinal plant extracts for antibacterial and antitumor activities, *Türk J Biol*, 36, 641-652, TÜBİTAK doi:10.3906/biy-1203-16.

[65] Ji1, H-f., Du, A-l., Zhang, L-w., Xu, C-y., Yang, M-d., & Li, F-f. (2012). Effects of drying methods on antioxidant properties in *Robinia pseudoacacia* L. flowers, Full Length Research Paper, *Journal of Medicinal Plants Research*, Vol. 6(16), pp. 3233-3239, DOI: 10.5897/JMPR12.107 ISSN 1996-0875.

[66] Yarat, A., Yanardag, R. & Özgür, S. (2010). Effect of Some Medicinal Plants Grown in Turkey on Platelet Aggregation, The 2nd International Symposium on Medicinal Plants, Their Cultivation and Aspects of Uses, Abstracts Book, Petra– Jordan.

[67] European Medicines Agency, Science Medicines Health (2012). Assessment report on Viscum album L., herba, EMA/HMPC/246778/2009 Committee on Herbal Medicinal Products (HMPC).

[68] Suhad, S., Humadi, S.S. & Viorica-Istudor V. (2009). Lythrum Salicaria (Purple Loosestrife). Medicinal Use, Extraction and Identification of Its Total Phenolic Compounds, *Farmacía*, Vol.57, 2.
[69] Do, T.K.T., Loffredo, L., Hadji-Minaglou, F., Antoniotti, S. & Fernandez X., (2011). Initial Investigations on Four Species of Osmanthus by Hptlc, www.botanicert.com.

[70] Molina, M. (2009). Local Knowledge and Management of the Royal Fern (Osmunda regalis L.) in Northern Spain: Implications for Biodiversity Conservation, American Fern Journal 99(1):0–0.

[71] Gulshan, A.B., Dasti, A.A., Hussain, S., Atta, M.I. & Amin-ud-Din, M. (2012). Indigenous Uses of Medicinal Plants in Rural Areas of Dera Ghazi Khan, Punjab, Pakistan, ARPN Journal of Agricultural and Biological Science, vol. 7, no. 9.

[72] Schmidt-Lebuhn, A.N., M. de Vos, J., Keller, B. & Conti, E. (2012). Phylogenetic analysis of Primula section Primula reveals rampant non-monophyly among morphologically distinct species, ELSEVIER, Molecular Phylogenetics and Evolution.

[73] Majid, A., Hassan, S., Hussain, W., Khan, A., Hassan, A., Khan, T., Ahmad, T. & Ur-Rehman, M. (2014). In vitro Approaches of Primula vulgaris Leaves and Roots Extraction against Human Pathogenic Bacterial Strains, World Applied Sciences Journal 30 (5): 575-580.

[74] Kilic, O. & Bagci, E. (2013). An ethnobotanical survey of some medicinal plants in Kebean (Elazığ-Turkey), Full Length Research Paper, Journal of Medicinal Plants Research, Vol. 7(23), pp. 1675-1684.

[75] European Medicines Agency Evaluation of Medicines for Human Use (2008). Assessment Report on Polypodium vulgare L., Rhizoma, Doc. Ref.: EMEA/HTMP/600669.

[76] URL 12. 10.08.2016. http://www.naturalmedicinalherbs.net/herbs/b/blechnum-spicant.

[77] Uğurlu, E., Seçmen, Ö. (2008). Medicinal plants popularly used in the villages of Yunt mountain (Manisa-Turkey), Fitoterapia, 79, 126-131.

[78] Gürhan, G., Ezer, N. (2004). Plants used for hemorrhoid treatment in folk medicine I., Hacettepe University Journal of the Faculty of Pharmacy, 24, 37-55.

[79] Passalacqua, N.G., Guarrea, P.M., De-Fine, G. (2007). Contribution to the knowledge of the folk plant medicine in Calabria Region (Southern Italy), Fitoterapia, 78, 52-68.

[80] Erdoğan, T.F. (2013). Ranunculus Türlerinin Kimyasal Bileşikleri ve Biyolojik Aktiviteleri, Hacettepe Üniversitesi Eczacılık Fakültesi Dergisi, Cilt 33, Sayı 1, ss. 105-116.

[81] Cenić-Milošević, D., Tambur, Z., Ivančajić, S., Bokonjić, D., Čuković, A., Stanojković, T., Grozdanić, N., Kulišić, Z. & Jurančić, Z. (2013). Antiproliferative Effects of Camellia sinensis, Frangula alnus and Rosmarinus officinalis, Arch. Biol. Sci., Belgrade, 65(3), 885-891.

[82] European Medicines Agency, Evaluation of Medicines for Human Use (2007). Assessment Report on Rhamnus frangula L., Cortex, Committee on Herbal Medicinal Products (HMPC), Doc. Ref: Emea/Hmpc/76306/2006.

[83] Baricevic, D., Bernáth, J., Maggioni, L. & Lipman, E. (2002). Report of a Working Group on Medicinal and Aromatic Plants, Working Group on Medicinal and Aromatic Plants: First Meeting, IPGRI is a Future Harvest Centre supported by the Consultative Group on, International Agricultural Research (CGIAR).

[84] Buřičová, L., Andjelković, M., Čermáková, A., Rěblová, Z., Jurček, O., Kolehmainen, E., Verhé R., Kvasnička, F. (2011). Antioxidant capacity and antioxidants of strawberry, blackberry, and raspberry leaves, Czech J. Food Sci., 29: 181–189.

[85] Kolayli, S., Küçük, M., Duran, C., Candan, F. & Dinçer B. (2003). Chemical and Antioxidant Properties of Laurocerasus officinalis Roem. (Cherry Laurel) Fruit Grown in
the Black Sea Region, Agric. Food Chem., 51 (25), pp 7489–7494, DOI: 10.1021/jf0344486.

[86] Avcı, G., Kupeli, E., Eryavuz, A., Yesilada, E. & Kucukkurt, I. (2006). Anti hypercholesterolaemic and antioxidant activity assessment of some plants used as remedy in Turkish folk medicine, ELSEVIER, ScienceDirect, Journal of Ethnopharmacology, 107, 418–423.

[87] İlbay, Z., Şahin, S. & Kırbaşlar, Ş.İ. (2013). Investigation of Polyhenolic Content of Rose Hip (Rosa canina L.) Tea Extracts: A Comparative Study, Foods 2, 43–52; doi:10.3390/foods2010043, ISSN 2304-8158.

[88] Zhang, Y., Zhang, Z., Yang, Y., Zu, X., Guan, D. & Wang, Y. (2011). Diuretic Activity of Rubus idaeus L. (Rosaceae) in Rats, Research Article, Tropical Journal of Pharmaceutical Research, 10(3), 243-248.

[89] Crisan, G., Vlase, L., Balca, G., Muntean, D., Stefanescu, C, Paltinean, R., Tamaș, M., Leuca, S. (2010). Lc /MS Analysis of Aucubin and Catalpol of Some Veronica Species, Farmacia, Vol.58, 2.

[90] Devi1, V.A., Arumugasamy, K.A., Shalimo1 A., Nantha-Kumar R., Udhayasankar, M.R. & Kokilavani, R. (2014). Anti-Inflammatory Activity of Smilax wightii fruit, Endemic A.DC. (Smilacaceae) -An Endangered Medicinal Plant from the Nilgiris, Journal of Pharmaceutical and Biological Research, Research Article, ISSN:2347–8330, JPBR, Vol.2(2): 136-138.

[91] URL 13. 11.11.2016. http://medicinalherbinfo.org/herbs/CommonNightshade.html.

[92] Kumar, S., Bajwa, B.S., Kuldeep, S. & Kalia, A.N. (2013). Anti-Inflammatory Activity of Herbal Plants: A Review, International Journal of Advances in Pharmacy, Biology and Chemistry, IJAPBC – Vol. 2(2), ISSN: 2277-4688.

[93] Sharma, S.K., Singh, L., Singh, S., (2013). A Review on Medicinal Plants Having Antioxidant Potential, Indian Journal of Research in Pharmacy and Biotechnology, ISSN: 2321-5674 (Print), ISSN: 2320 – 3471.

[94] Huang, S.-S., Huang, G.-J., Ho, Y.-L., Lin, Y.-H., Hung, H.-J., Tien-Ning, Chang, T.-N., Chang M.-J., Chen, J-J, & Chang, Y.-S. (2008). Antioxidant and antiproliferative activities of the four Hydrocotyle species from Taiwan, Botanical Studies Biochemistry 49: 311-322.

[95] URL 14. 11.02.2016. http://www.everygreenherb.com/viola.html.

[96] Yıldırım, E, Dursun, A, Turan, M. (2000). Determination of the Nutrition Contents of the Wild Plants Used as Vegetables in Upper Çoruh Valley, Turkish Journal of Botany, 25, 369.

[97] Tukan, S., Takruri, H.R., Al- Eisawi D.M. (1998). The use of wild edible plants in the Jordanian, International Journal of Food Sciences and Nutrition, 49, 225-235.