# THE ECONOMIC VALUE OF FLORA IN THE ORĂŞTIE RIVER BASIN (CENTRAL-WESTERN ROMANIA)

**Vinţan Valeriu-Ioan***

*The Secondary School "Dr. Aurel Vlad", PhD in Biology, Orăştie, Romania,
e-mail: valeriuvintan@yahoo.com

***Abstract***

*In the current paper we present an inventory of the flora with economic value in the Orăştie river basin. The researches made by us between 2009 - 2014 prove the fact that in the spontaneus and subspontaneous flora the predominant plants are those melliferous, followed by toxic plants, the medicinal plants,the industrial, forage, decorative and alimentary plants. The inventary of the fito-economic potential of a region represents a prerequisite in the complex development of natural resources, on the basis of the long lasting development principles.*

**Key words:** Orăştie river basin, medicinal plants, alimentary plants, melliferous plants, decorative plants, *Angelica archangelica* L..

## INTRODUCTION

The Orăştie river basin lies between the corresponding ones of Strei (to the south and west) and of Cugir (to the east). To the north the studied river basin ends up in the Mureş river, whose tributary is the river Orăştie, in fact (Fig. 1).

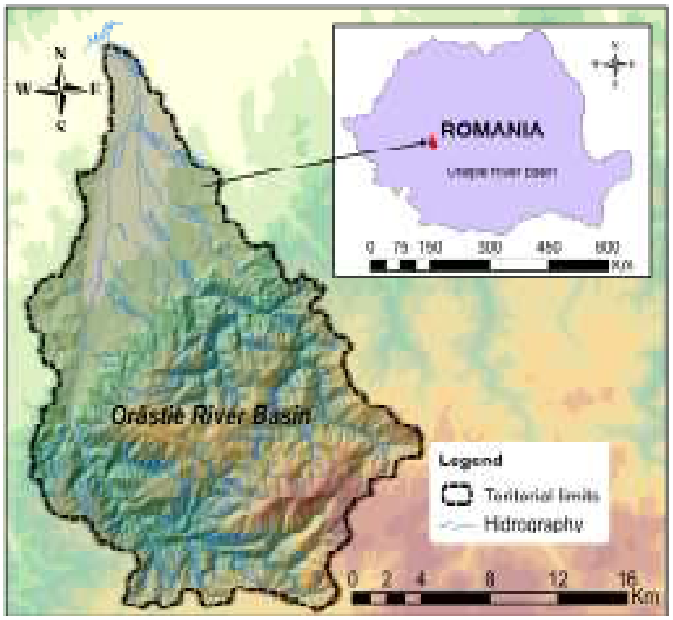


Fig. 1 Position of Orăştie River Basin in Romania

From the geographical viewpoint, there are three zones in the Orăştie river basin, each one showing a distinct geographical landscape: the mountainous zone (the west-north-western sector of the Sureanu Mountains), the foothills zone (the Şureanu Piedmont) and the depressionary zone (the Orăştie Corridor).

The territory under analysis is part of the temperate climatic zone of its continental type, its maritime influenced climatic sector, the Southern Carpatians subdivision, the complex topoclimate of the Orăştie lowlands and Parâng highlands (Pătru I. et al., 2006).

The thermal differences between the outskirts of the mountains and the high ridges are of roughly 10 degrees Celsius on average. Towards their north-western limits, due to warm air incursions from the Banato-Crişana plains, the average temperatures range from 9 to 10 degrees Celsius. In winter, the average temperatures vary between minus 2 and minus 7 degrees Celsius, in spring they rise by 6 to 12 degrees, in summer they reach 8 degrees on the mountain tops and over 19 degrees on the outskirts, while in autumn the average temperatures decrease by 5.5 to 7 degrees as compared to those in the summer months (Trufaş V., 1986).

The rainfall amounts in multiannual average to approximately 550-600 mm in the outskirts and to over 1000 mm in the high altitude central parts. In the whole of Transylvania the rainfall quantum is 500 to 700 mm per year (Pătru I. et al., 2006).

**MATERIALS AND METHODS**

The conspectus and analysis of flora in the Orăştie river basin were based upon our own research conducted between 2009 – 2014, as well as upon the data collected from the herbariums at the Sibiu Natural History Museum. To this we may add the information from the specialized bibliography: Fuss M, 1866, Schur J. F., 1866, Simonkai L., 1886, Flora României, 1952 – 1976, Boşcaiu et al.,1972, Balazs M, 1993.

Identification of taxa was performed based on specialized determiners: Flora României (1952-1976), Illustrated Flora of România (Ciocârlan V., 2009), Wildpflanzen Siebenbürgens (Speta E., Rákosy L., 2010), Vascular Plants of România – Field-trip Illustrated Determiner (Sârbu I. et al., 2013). The systematical framing of taxa was done according to the phylogenetic system implemented by Pop I. et al.,1983. The nomenclature of species and infrataxa is in accordance with that of Ciocârlan V., 2009.

The anlysis of the categories of plants economic importance was done according to Pop I., 1982.

**RESULTS AND DISSCUSIONS**

The researches made by us in the Orăstie river prove the fact that in the spontaneous and subspontaneous flora the melliferous plants (240 species) are predominant, followed by the toxic ones (182 species), the medicinal plants (128 species), industrial (118 species), forages (114 species), decorative (68 species) and alimentary plants (61 species). The great number of plants with economical value consists in the fact that a species cannot belong to two or more economic categories.

**Preponderance of plant categories with economic importance in the vascular flora in the Orăştie river basin**

Table1

| No crt. | The economic importance | | | No species |
|---|---|---|---|---|
| 1. | **Alimentary plants (Al.)** | 61 species | culinary (Al. cu) | 44 |
| | | | flavoured and spicy (Al. ar) | 11 |
| | | | oleaginous (Al. ol) | 6 |
| 2. | **Forage plants (Fr.)** | 114 species | with very good nutritive value (Fr. 4) | 16 |
| | | | with good nutritive value (Fr. 3) | 18 |
| | | | with mediocre nutritive value (Fr. 2) | 34 |
| | | | with low nutritive value (Fr. 1) | 46 |
| 3. | **Melliferous plants (Me.)** | 240 species | with very high economic-apiarian preponderance (Me. 4) | 3 |
| | | | with high economic-apiarian preponderance (Me. 3) | 17 |
| | | | with mediocre economic-apiarian preponderance (Me. 2) | 181 |
| | | | with low economic-apiarian preponderance (Me. 1) | 39 |
| 4. | **Medicinal plants (Md.)** | | | 128 |
| 5. | **Toxic plants (Tx.)** | | | 182 |
| 6. | **Decorative plants (De.)** | | | 68 |
| 7. | **Industrial plants (In.)** | 118 species | wood industry (In. lm) | 35 |
| | | | domestic industry (In. ca) | 10 |
| | | | chemical industry (In.ch) | 12 |
| | | | cellulose and paper industry (In. cl) | 5 |
| | | | dye and leather industry (In. tc) | 56 |

**1. Alimentary plants** (Al., 61species) are subdivided in three categories, according to their uses and properties:

**a. culinary** (Al. cu, 44 species) used fresh or canned or as preparations. Among these we mention the following: *Allium ursinum* L., *Angelica archangelica* L., *Cornus mas* L., *Corylus avellana* L., *Malus sylvestris* (L.) Mill., *Pyrus pyraster* (L.) Burgsd., *Rosa canina* L., *Rosa pendulina* L., *Rubus idaeus* L., *Rumex acetosa* L., *Sorbus torminalis* (L.) Crantz, *Vaccinium myrtillus* L., *Vaccinium vitis-idaea* L..

**b. flavoured** (Al. ar, 11 species) that together give food taste and aroma: *Armoracia rusticana* P. Gaertn., B.Mey. et. Scherb., *Artemisia absinthium* L., *Brassica nigra* (L.) W. D. J., *Cardamine pratensis* L., *Carum carvi* L., *Humulus lupulus* L., *Melissa officinalis* L. etc..

**c. oleaginous** (Al. ol, 6 species) from whose seeds or fruit we obtain vegetal oils: *Brassica elongata* Ehr., *Brassica rapa* L., *Cornus sanguinea* L., *Fagus sylvatica* L., *Raphanus raphanistrum* L., *Sinapis arvensis* L..

**2. Forage plants** (Fr., 114 species) which are the forage base of animals in Orăstie river basin, and are divided in 4 categories:

**a. with very good nutritive value** (Fr. 4, 16 species), among which we mention: *Alopecurus pratensis* L., *Anthoxanthum odoratum* L., *Arrhenatherum elatius* (L.) Beauv. ex J. et C. Presl, *Dactylis glomerata* L., *Festuca pratensis* Huds., *Medicago falcata* L., *Medicago sativa* L., *Onobrychis viciifolia* Scop., *Sorghum halepense* (L.) Pers., *Trifolium hybridum* L., *Trifolium pratense* L., *Trifolium repens* L..

**b. with good nutritive value** (Fr. 3, 18 species), among which we mention: *Agrostis capillaris* L., *Agrostis stolonifera* L., *Festuca rubra* L., *Lotus corniculatus* L., *Medicago lupulina* L., *Poa nemoralis* L., *Trifolium fragiferum* L., *Trifolium medium* L., *Vicia grandiflora* Scop..

**c. with mediocre nutritive value** (Fr. 2, 34 species), among which we mention: *Alchemilla vulgaris* L. emend. Fröhner, *Echinochloa crus-galli* (L.) Beauv., *Elymus repens* (L.) Gould, *Festuca rupicola* Heuff., *Fragaria vesca* L., *Poa annua* L., *Trifolium alpestre* L., *Trifolium montanum* L., *Trifolium ochroleucon* Huds., *Vicia sylvatica* L..

**d. with low nutritive value** (Fr. 1, 46 species), among which we mention: *Apera spica-venti* (L.) Beauv., *Astragalus onobrychis* L., *Bellis perennis* L., *Brachypodium pinnatum* (L.) Beauv., *Bromus arvensis* L., *Deschampsia caespitosa* (L.) Beauv., *Deschampsia flexuosa* (L.) Trin., *Festuca valesiaca* Schleich. ex Gaudin, *Holcus lanatus* L., *Lapsana communis* L., *Leontodon autumnalis* L., *Nardus stricta* L., *Pimpinella saxifraga* L., *Symphytum officinale* L., *Trifolium arvense* L., *Trifolium campestre* Schreb., *Vicia cracca* L..

**3. Melliferous plants** (Me., 240 species) which are important for apiculture and are grouped in 4 categories:

**a. with very high economic-apiarian preponderance** (Me. 4, 3 species) - *Robinia pseudacacia* L., *Rubus idaeus* L., *Tilia tomentosa* Moench.

**b. with high economic-apiarian preponderance** (Me. 3, 17 species), among which we mention: *Abies alba* Mill., *Acer tataricum* L., *Chamerion angustifolium* (L.) Holub., *Melilotus albus* Medik., *Mentha arvensis* L., *Onobrychis viciifolia* Scop., *Picea abies* (L.) H. Karst., *Salix alba* L., *Salix caprea* L..

**c. with mediocre economic-apiarian preponderance** (Me.2, 180 species), some examples of these are: *Acer campestre* L., *Allium ursinum* L., *Angelica archangelica* L., *Aster amellus* L., *Bellis perennis* L., *Centaurea cyanus* L., *Cerasus avium* (L.) Moench, *Colchicum autumnale* L., *Consolida regalis* S.F. Gray, *Crataegus monogyna* Jacq., *Crocus vernus* (L.) Hill, *Dactylorhiza maculata* (L.) Soó, *Eupatorium cannabinum* L., *Filipendula ulmaria* (L.) Maxim., *Fragaria viridis* (Duchesne) Weston, *Galanthus nivalis* L., *Lamium album* L., *Lilium martagon* L., *Lotus corniculatus* L., *Malus sylvestris* (L.) Mill., *Melissa officinalis* L., *Melittis melissophyllum* L., *Nepeta nuda* L., *Orchis laxiflora* Lam., *Orchis militaris* L., *Orchis morio* L., *Papaver rhoeas* L., *Populus tremula* L., *Prunella vulgaris* L., *Pyrus pyraster* (L.) Burgsd., *Rosa canina* L., *Rosa pendulina* L., *Rubus caesius* L., *Salvia pratensis* L., *Sambucus nigra* L., *Scabiosa ochroleuca* L., *Scilla bifolia* L., *Stachys sylvatica* L., *Symphytum officinale* L., *Tanacetum vulgare* L., *Taraxacum officinale* Weber, *Telekia speciosa* (Schreb.) Baumg., *Thymus glabrescens* Wild., *Trifolium campestre* Schreb., *Trifolium fragiferum* L., *Trifolium hybridum* L., *Trifolium medium* L., *Trifolium montanum* L., *Vaccinium myrtillus* L., *Vaccinium vitis-idaea* L., *Valeriana officinalis* L., *Viburnum opulus* L., *Vicia grandiflora* Scop., *Viola odorata* L..

**d. with low economic-apiarian preponderance** (Me.1, 39 species), among which we mention: *Asparagus officinalis* L., *Chaerophyllum aromaticum* L., *Convallaria majalis* L., *Filipendula vulgaris* Moench, *Fragaria vesca* L., *Iris pseudacorus* L., *Oenothera biennis* L., *Spiraea chamaedryfolia* L., *Syringa vulgaris* L., *Vinca minor* L..

**4. Medicinal plants** (Md., 128 species), among which we mention: *Adonis vernalis* L., *Agrimonia eupatoria* L., *Angelica archangelica* L. (fig. 1), *Arctium lappa* L., *Centaurea cyanus* L., *Chelidonium majus* L., *Cichorium intybus* L., *Colchicum autumnale* L., *Convallaria majalis* L., *Crataegus monogyna* Jacq., *Digitalis grandiflora* Mill., *Dryopteris filix-mas* (L.) Schott, *Equisetum arvense* L., *Eryngium planum* L., *Helleborus purpurascens* Waldst et Kit., *Humulus lupulus* L., *Hyoscyamus niger* L., *Hypericum perforatum* L., *Inula helenium* L., *Leonurus cardiaca* L., *Melissa officinalis* L., *Mentha pulegium* L., *Menyanthes trifoliata* L.,

*Prunus spinosa* L., *Rosa canina* L., *Rosa pendulina* L., *Rubus idaeus* L., *Saponaria officinalis* L., *Urtica dioica* L., *Vaccinium myrtillus* L., *Vaccinium vitis-idaea* L., *Valeriana officinalis* L., *Veratrum album* L., *Verbascum phlomoides* L., *Viburnum opulus* L., *Viscum album* L..

Fig. 1 *Angelica archangelica* L., Sibişelului Valley (15.07.2012)

**5. Toxic plants** (Tx., 183 species), among these we enumerate: *Alliaria petiolata* (M. Bieb.) Cavara et Grande, *Anemone nemorosa* L., *Anemone ranunculoides* L., *Anemone sylvestris* L., *Atropa belladona* L., *Chelidonium majus* L., *Colchicum autumnale* L., *Conium maculatum* L., *Consolida regalis* S.F. Gray, *Convallaria majalis* L., *Datura stramonium* L., *Daucus carota* L., *Helleborus purpurascens* Waldst et Kit., *Lactuca serriola* L., *Papaver rhoeas* L., *Paris quadrifolia* L., *Scilla bifolia* L., *Scopolia carniolica* Jaq., *Veratrum album* L..

**6. Decorative plants** (De., 68 species), among which we mention: *Abies alba* Mill., *Bellis perennis* L., *Betula pendula* Roth, *Convallaria majalis* L., *Crocus vernus* (L.) Hill, *Galanthus nivalis* L., *Hepatica nobilis* Screb., *Larix decidua* Mill., *Leucanthemum vulgare* Lam., *Leucojum vernum* L., *Lilium martagon* L., *Myosotis sylvatica* Ehr. ex Hoffm., *Narcissus radiiflorus* Salisb., *Primula veris* L., *Scilla bifolia* L., *Scopolia carniolica* Jaq., *Spiraea chamaedryfolia* L., *Syringa vulgaris* L., *Vinca minor* L., *Viola odorata* L..

**7. Industrial plants** (In., 118 species), important for different branches of industry, are classified in 5 categories:

**a. wood industry** (In. lm, 35 species), among which we enumerate: *Abies alba* Mill., *Alnus glutinosa* (L.) Gaertn., *Betula pendula* Roth, *Carpinus betulus* L., *Cerasus avium* (L.) Moench,, *Fagus sylvatica* L., *Fraxinus excelsior* L., *Larix decidua* Mill., *Picea abies* (L.) H. Karst., *Pinus*

*sylvestris* L., *Populus alba* L., *Populus nigra* L., *Populus tremula* L., *Quercus cerris* L., *Quercus petraea* Liebl., *Quercus polycarpa* Schur, *Quercus robur* L., *Robinia pseudacacia* L., *Salix alba* L., *Salix caprea* L., *Salix fragilis* L., *Salix triandra* L. emend. Ser., *Tilia cordata* Mill., *Tilia tomentosa* Moench, *Ulmus glabra* Huds., *Ulmus minor* Mill..

**b. domestic industry** (In. ca, 10 species), among which we mention: *Corylus avellana* L., *Morus alba* L., *Salix alba* L., *Salix cinerea* L., *Salix fragilis* L., *Salix purpurea* L., *Typha latifolia* L..

**c. chemical industry** (In. ch,, 12 species), among which we mention: *Abies alba* Mill., *Fagus sylvatica* L., *Fraxinus ornus* L., *Larix decidua* Mill., *Picea abies* (L.) H. Karst., *Pinus sylvestris* L., *Populus nigra* L., *Sorbus aucuparia* L..

**d. cellulose and paper industry** (In. cl, 5 species): *Phragmites australis* (Cav.) Steud., *Picea abies* (L.) H. Karst., *Populus tremula* L., *Typha angustifolia* L., *Typha latifolia* L..

**e. dye and leather industry** (In. tc, 56 species), among which we mention: *Alnus glutinosa* (L.) Gaertn., *Alnus incana* (L.) Moench, *Anthemis tinctoria* L., *Betula pendula* Roth, *Genista tinctoria* L., *Hedera helix* L., *Malva sylvestris* L., *Myricaria germanica* (L.) Desv., *Papaver rhoeas* L., *Polygonum aviculare* L., *Polygonum hydropiper* L., *Polygonum persicaria* L., *Potentilla anserina* L., *Potentilla erecta* (L.) Raeusc., *Potentilla reptans* L., *Prunus spinosa* L., *Pulmonaria officinalis* L., *Quercus petraea* Liebl., *Quercus robur* L., *Rumex acetosella* L., *Salix alba* L., *Salix triandra* L. emend. Ser., *Sambucus ebulus* L., *Sambucus nigra* L., *Saponaria officinalis* L., *Scilla bifolia* L., *Serratula tinctoria* L., *Solanum nigrum* L., *Sorbus aucuparia* L., *Sorbus torminalis* (L.) Crantz, *Tanacetum vulgare* L., *Taraxacum officinale* Weber, *Tilia cordata* Mill., *Tilia tomentosa* Moench, *Vaccinium vitis-idaea* L., *Viburnum opulus* L..

## CONCLUSIONS

The floral studies made by us in the geographical area bordered by the Orăstie river acknowledge the preponderance of melliferous plants (240 species), followed by the toxic ones (182 species), medicinal (128 species), industrial (118 species), forage (114 species), decorative (68 species) and alimentary plants (61 species).

Nowadays, the flora in the Orăştie river basin is very weakly harnessed to profit from an economic point of view, even though in this area there is a tradition in processing forestry species, in gathering and processing medicinal plants from the spontaneous flora.

**REFERENCES**


1. Balazs, M., 1993, Flora şi vegetaţia văilor Godeanu, Tâmpu şi Anineş (Munţii Şureanu). Sargetia, Acta Musei Devensis, Seria Şti. Nat., Deva, 14-15: 73-86.
2. Boşcaiu N., Cernelea E., Coldea G., Lupşa V., Péterfi L. Ş., Plămadă E., Resmeriţă I., Täuber F., Vicol E., 1972, Studiu fitocenologic al pajiştilor din sectorul hunedorean al Văii Mureşului. Sargetia, Acta Musei Devensis, Seria Şti. Nat., Deva, 9: 53-75.
3. Ciocârlan V., 2009, Flora ilustrată a României. Pteridophyta et Spermatophyta. Editura Ceres Bucureşti, 1141 p.
4. Fuss M., 1866, Flora Transsilvaniae Excursoria, Haeredum Georgii de Closius, Cibinii, 864 p.
5. Pătru I., Zaharia L., Oprea R., 2006, Geografia fizică a României. Editura Universitară, Bucureşti, 175 p.
6. Pop I., 1982, Plante spontane şi subspontane cu valoare economică din flora R.S. România. Contrib. Bot., Cluj-Napoca, pp. 131-142.
7. Pop I., Hodişan I., Mititelu D., Lungu L., Cristurean I., Mihai G.,1983, Botanică sistematică, Editura Didactică şi Pedagogică, Bucureşti, 420 p.
8. Schur, J. F., 1866, Enumeratio Plantarum Transsilvaniae. Guilielmum Braumiiller, Vindobonae, 980 p.
9. Trufas V., 1986, Muntii Sureanu. Editura Sport-Turism, Bucuresti, 176 p.
10. Simonkai L., 1886, Enumeratio Florae Transsilvanicae Vasculosae Critica, Budapesta, 678 p.
11. Sârbu I., Ştefan N., Oprea A., 2013, Plante vasculare din România – Determinator ilustrat de teren. Editura Victor B Victor, 1320 p.
12. Speta, E., Rákosy, L. (2010), Wildpflanzen Siebenbürgens. Verlag und Druck: Plöchl Druck GmbH, Freistadt, Austria, 624 p.
13. ***1952-1976, Flora României, I-XIII, Editura Academiei Române, Bucureşti.