

ABOUT THE MELLIFEROUS RESOURCES OF THE SIBIU COUNTY. APOLDUL DE JOS - A CASE STUDY

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Abstract

Our study has as a purpose to identify the main melliferous plants from the locality Apoldul de Jos and its surroundings. In this paper we want to complete our researches in the Sibiu county in order to turn to the best account the melliferous resources of the studied habitat and to complete the melliferous base with the new data. In order to be accomplished the purpose, there were applied the following methods of study: the utilization of the information from the specialized literature, the direct observation in the field, the collecting of the botanical material in this area and its identification in laboratory. After this study there were identified 19 Families of plants, with 46 species, mainly in the spontaneous and sub-spontaneous flora, with obvious implications in the beekeeping. The melliferous resources of the zone were grouped together from the point of view of the importance in apiculture, into four groups. Year by year, in the last period, more and more farmers tended towards the activity of the beekeeping. So, the knowledge of the flowery potential of the county, proved to be the success key in the beekeeping.

Key words: Melliferous base, Apoldul de Jos (Sibiu county)

INTRODUCTION

Among all insects, the most important are the bees; for a good reason, our special admiration is directed to them, as they were created for the sake of humanity [17].

The Mythographian specialists agree that the first and the greatest beekeeper in Antiquity was Aristeu. He was the son of the Cyrene nymph and Apollo. He received a high education, having as teachers the centaur Chiron, the nymphs and Proteu. All of them taught him the animal breeding and first of all the beekeeping; The result was the spreading the beekeeping in all Ellada. It was of a panhellenic notoriousness, that under the name of Aristeu were to be understood, in many places, Apollo, Dionysos or even Zeus, “they being worshiped as Gods both by the barbarian Thracians and by the civilized Greeks “[10].

The honey was a part of the Gods’ menu. Zeus himself was nourished with the goat’s milk and honey. With this substantial food, Zeus strengthened quickly his body; among his first braveries was to break the goat’s

horn, who gave him milk and to offer it to the nymph Amaltea, with the promise that the horn was to be forever filled with all kind of fruits; it is to be known as “The horn of plenty”.

The exceptional qualities of the honey was the reason for embalming the Macedonian king Alexander the Great in a golden sarcophagus filled with honey. The sarcophagus was transported to Egypt under the command of Ptolemeu. In Egypt the golden sarcophagus was robbed and substituted for another one, of glass, its trace being lost. So, the great conqueror nowhere could find his place for the eternal rest.

The bee was so appreciated, that it was represented even on Napoleon’s imperial mantle, underlining thus the multiple heraldic meanings.

On the Traian’s Column is certified the beekeeping in the Geto-Dacian area, that is a proof that the hyperborean people were connected to Aristeu’s world later, the honey produced in the Romanian areal sweetened without interruption, the life of the adjacent Empires.

The magic of beekeeping is a mystery that concerns also the soul and the mind of the candidate to retirement, who dreams to spend his old age in the silence of an apiary and to enjoy to live in harmony with the little creatures, understanding each other better than with his fellowmen from the community he left at his retirement.

MATERIALS AND METHODS

The investigations took place in the locality Apoldul de Jos in the Sibiu county in the period 2016-2018. In order to identify the melliferous base in the studied habitat, the following steps were taken into consideration:

- Making use of the specialized literature
- The observations in the field with the purpose for identification and inventorying of the melliferous flora in the perimeter of the locality Apoldul de Jos.
- The utilization of the direct method of collecting the plants in this zone.
- The identification in lab of the collected botanical material and the elaboration of the floristic list with the main melliferous species. [4,9,13-16, 20].

RESULTS AND DISCUSSIONS

There is a close connection between plants and bees. The bees have an important role in quantitative and qualitative increase of the fruit and seeds harvests, in the same time with getting an increased honey production [5]; the plants provide bees with nectar and pollen, the food for the different development stages of the bees, adult and larvae.

In order to turn to best account more rationally the melliferous resources in Sibiu county [11,12], it is necessary to know closer the main melliferous plants of this habitat.

In the present paper we want to complete, with new data, our studies made in the Sibiu county in the localities Vurpar, Avrig, Saliste [1-3, 21, 22].

The commune Apoldul de Jos is localized in the western part of the Sibiu county (Fig.1), at the southern part of the Transylvanian Plateau and at the South-East of the Secaselor Plateau,

building together the Apold-Miercurea Depression [23].

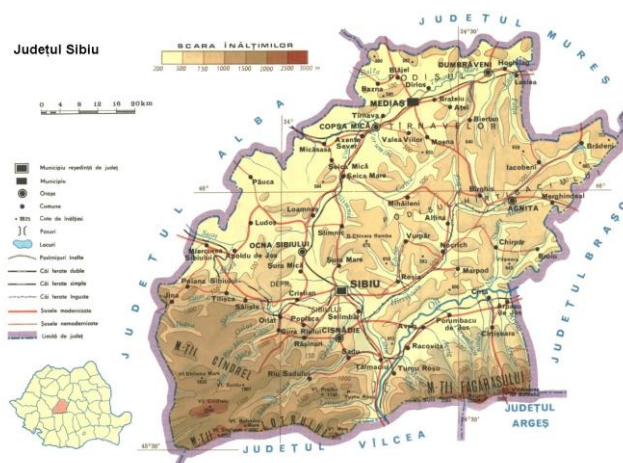


Fig. 1. The localization of Apoldul de Jos locality in Sibiu County

Source: <https://pe-harta.ro/sibiu/>

The region is characterized by a zone with low hills, 400-500 m. high and a continental temperate climate with an yearly average temperature of 8.7° C and abundant rainfalls. The zone is characterized by the presence of the cultivated plots of land (mainly vegetables, potatoes, vineyards), of the meadows with mezzo-xerophiles species, leafy trees forests (oak trees, hornbeams, maples, acacia and the presence of the numerous shrubs species (hazelnut trees, elder trees, hiprose trees, flowering ash) [11,12,24]. The floristic potential of the zone was analyzed by many specialists and it was the subject of many studies [6-8,19]. In 2003, the botanist dr. biol. Constantin Dragulescu identified in his book "Cormoflora jud. Sibiu", a number of 105 species for the locality Apoldul de Jos. The information is evidencing only 10%-20% of the floristic potential of this zone [8].

For a better systematization and knowledge of the melliferous plants in the studied habitat, we approached the botanical classification system, where the melliferous plants were grouped on Families (Table 1).

By analyzing the flora in the Apoldul de Jos zone, in the Sibiu county (Table 1) we highlighted a number of 46 melliferous species that belong to 19 botanical families.

Table 1. The melliferous plants species from the Apoldul dr Jos (Sibiu county) and their specific beekeeping weight (power).

Nr. crt	Plant family	Species	Bee keeping importance	Observations
1	Fagaceae	<i>Quercus robur</i> L.	Medium	Arboricol species which grows in the hilly-mountainous level. It is also considered a medicinal plant.
2	Aceraceae	<i>Acer platanoides</i> L.	Medium	Valuable melliferous tree.
3	Oleaceae	<i>Fraxinus ornus</i> L.	Medium	It is a small tree, with flowers, in great demand for bees. It furnishes a good harvest in springtime.
4	Betulaceae	<i>Corylus avellana</i> L.	Medium	The male flowers represent a rich source of pollen in earlier springtime with the role in the maintenance and the development of the bees families.
5	Adoxaceae	<i>Sambucus nigra</i> L.	Medium	Bushy species, in the hilly-mountainous level and in a great demand for bees for nectar and pollen.
6	Ranunculaceae	<i>Adonis vernalis</i> L.	Medium	A perennial herbaceous plant, sporadic in the hilly zone. It furnishes pollen and nectar in the earlier springtime. It takes part of the category of the medicinal toxic herbs.
7	Polygonaceae	<i>Polygonum aviculare</i> L.	Small	It is an yearly herbaceous plant in the spontaneous flora, frequent in the hilly-mountainous zone.
		<i>Polygonum hydropiper</i> L.	Medium	Frequent in the hilly-mountainous level. It is also a medicinal herb.
8	Rosaceae	<i>Filipendula vulgaris</i> Mnch.	Small	It is a perennial plant in the spontaneous flora, in the hilly-mountainous zone.
		<i>Prunus spinosa</i> L.	Medium	Bushes in the spontaneous flora, frequent in the hilly-mountainous level, a medicinal herb. It is frequently visited by bees
		<i>Rosa canina</i> L.	Medium	A common bush in the hilly-mountainous level.
		<i>Rubus idaeus</i> L.	Large	It is in a hilly-mountainous level. It is one of the most valuable melliferous bushes. Its nectar secretion is intense during all period of flowering.
		<i>Malus silvestris</i> (L.) Mill.	Medium	It is sporadic in the hilly-

				mountainous level. It is an important source of pollen and nectar.
		<i>Pyrus pyrastrer</i> (L.)Burgsd	Medium	Sporadic, in the hilly-mountainous level.
9	Fabaceae	<i>Amorpha fruticosa</i> L.	Medium	In the hilly-mountainous zone. It is toxic, it has a decorative value.
		<i>Lotus corniculatus</i> L.	Medium	It is a good fodder plant in the hilly-subalpine zone.
		<i>Medicago falcata</i> L.	Medium	It is frequent in the hilly-mountainous level. It is a valuable fodder plant.
		<i>Melilotus officinalis</i> (L.) Pall.	Medium	It is a medicinal herb, frequent species in the hilly-mountainous zone.
		<i>Trifolium campestre</i> Schreb.	Medium	It is frequent in the hilly-mountainous level.
		<i>Trifolium hybridum</i> L.	Medium	It is intensely visited by bees and a very good fodder plant.
		<i>Trifolium pratense</i> L.	Medium	It is frequent in the hilly-mountainous zone, an excellent fodder plant.
		<i>Trifolium repens</i> L.	Large	An excellent fodder plant.
		<i>Robinia pseudoacacia</i> L.	Very large	It is more frequent in the hilly level. It is the most important melliferous plant during the springtime main harvest.
10	Apiaceae	<i>Carum carvi</i> L.	Medium	A plant with medicinal and fodder values
		<i>Eryngium campestre</i> L.	Medium	It is frequent in the hilly-mountainous level; it has a medicinal value.
		<i>Heracleum spondylium</i> L.	Small	It could be found in the hilly-mountainous level; it has a characteristic flavoured odor.
		<i>Pimpinella saxifraga</i> L.	Small	A medicinal and fodder species of reduced value.
11	Malvaceae	<i>Althaea pallida</i> W. et K.	Small	It is sporadic in the hilly level. It is known also as a medicinal herb.
12	Violaceae	<i>Viola odorata</i> L.	Medium	It is frequent in the hilly-mountainous level.
13	Primulaceae	<i>Primula veris</i> L.em.Huds.	Medium	It is frequent in the hilly-mountainous level, intensely visited by bees and bumble bees, especially for their pollen. It is a medicinal herb.
14	Convolvulaceae	<i>Calystegia sepium</i> (L.)R.BR.	Medium	It is frequent at the altitude between 280-700m.
15	Boraginaceae	<i>Anchusa officinalis</i> L.	Medium	Species in the hilly-mountainous level, with medicinal and

				fodder values. It is considered as a contaminant of the alfalfa cultures.
		<i>Symphytum officinale</i> L. ssp. <i>officinale</i>	Medium	With medicinal qualities, it is frequent in the hilly-mountainous level.
16	Lamiaceae	<i>Mentha longifolia</i> (L.) Nath. ssp. <i>longifolia</i>	Medium	It is frequent in the hilly-mountainous level.
		<i>Prunella vulgaris</i> L.	Medium	A common species in the hilly-sub-Alpine zone.
		<i>Salvia pratensis</i> L.	Medium	It is frequent in the meadows of hills ascending till in the inferior mountainous level. It was identified also at the borders of the roads or ploughings. It furnishes nectar and pollen for the bees families during a long period of time of 4 months.
		<i>Teucrium chamaedrys</i> L.	Medium	It is considered also a medicinal herb, frequent in the hilly-mountainous level.
17	Rubiaceae	<i>Galium verum</i> L.	Small	It has a double role both as a melliferous species and also as medicinal herb. It is frequent in zone.
18	Dipsacaceae	<i>Dipsacus laciniatus</i> L.	Medium	It is a weed in the hilly level.
		<i>Scabiosa ochroleuca</i> L.	Medium	It is relatively frequent in the hilly-mountainous level. It blossoms all summer and it is very visited by bees and butterflies.
19	Asteraceae	<i>Arctium lappa</i> L.	Medium	A herb spread in the hilly-mountainous level. It is considered as a food plant.
		<i>Centaurea scabiosa</i> L.	Medium	It is relatively frequent in the hilly-mountainous level.
		<i>Cichorium intybus</i> L.	Medium	It is a fodder as an inferior quality and also a medicinal herb. It is frequent in the hilly-mountainous level.
		<i>Cirsium vulgare</i> (Savi) Ten.	Medium	It is a perennial melliferous species, frequent in the hilly-mountainous level. The flowers are a rich source of nectar for bees and butterflies.
		<i>Inula britannica</i> L.	Small	The species with medicinal qualities, is spread in the hilly-mountainous level.
		<i>Taraxacum officinale</i> Weber	Medium	The species is in the hilly-mountainous level, on the

				limits of roads, in non-cultivated zones. It is very valuable, mainly in the springtime and autumn for the pollen and nectar harvest. It is also a medicinal herb.
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Source: own concept.

These species could be classified in:

Families with a single representative:

Fagaceae (*Quercus robur* L.); Aceraceae (*Acer platanoides* L.); Oleaceae (*Fraxinus ornus* L.); Betulaceae (*Corylus avellana* L.); Adoxaceae (*Sambucus nigra* L.); Ranunculaceae (*Adonis vernalis* L.); Malvaceae (*Althaea pallida* W. et K.); Violaceae (*Viola odorata* L.); Primulaceae (*Primula veris* L.em. Huds.; Convolvulaceae (*Calystegia sepium* (L.) R.BR.); Rubiaceae (*Galium verum* L.).

Families with two representatives:

Polygonaceae (*Polygonum aviculare* L., *P. hydropiper* L.); Boraginaceae (*Anchusa officinalis* L., *Symphytum officinale* L. ssp. *officinale*); Dipsacaceae (*Dipsacus laciniatus* L., *Scabiosa ochroleuca* L.).

Families with four representatives:

Apiaceae (*Carum carvi* L., *Centaurea scabiosa* L., *Heracleum spondylium* L., *Pimpinella saxifraga* L.); Lamiaceae (*Mentha longifolia* (L.) Nath. ssp. *longifolia*, *Prunella vulgaris* L., *Salvia pratensis* L., *Teucrium chamaedrys* L.).

Families with six representatives:

Rosaceae (*Filipendula vulgaris* Mch., *Prunus spinosa* L., *Rosa canina* L., *Rubus idaeus* L., *Malus silvestris* (L.) Mill., *Pyrus pyrastrer* (L.) Burgsd); Asteraceae (*Arctium lappa* L., *Centaurea scabiosa* L., *Cichorium intybus* L., *Cirsium vulgare* (Savi) Ten., *Inula britannica* L., *Taraxacum officinale* Weber).

Families with nine representatives:

Fabaceae (*Amorpha fruticosa* L., *Lotus corniculatus* L., *Medicago falcata* L., *Melilotus officinalis* (L.) Pall, *Trifolium campestre* Schreb., *Trifolium hybridum* L., *Trifolium pratense* L., *Trifolium repens* L., *Robinia pseudacacia* L.).

In our country there were identified 398 melliferous plants in the spontaneous and sub-spontaneous flora, being distributed in four groups, considering their apiarian economical

importance: a very large, large, medium and small importance [18].

Among the 105 identified species in the studied habitat [8], 46 species (43.80%) belong to the melliferous resources of the locality Apoldul de Jos (Table 1.). They are grouped in function of their apiarian importance in 4 categories:

(i)The plants of a very large apiarian importance (2.17%) This category includes only the species *Robinia pseudacacia* L. that represents the most important melliferous species that furnishes the main springtime harvest.

(ii)The plants of a large apiarian importance (4.34%). In this category are included the species *Rubus idaeus* L. and *Trifolium repens* L. The raspberry bush grows spontaneous in zone. During the flourishing period, the secretion of nectar is very intense, the flowers are visited by bees from the first hours in the morning till the sunset.

The white trefoil (clover) is the species among the trefoils with the largest nectariferous capacity.

(iii)The plants of a medium apiarian importance (78.26%).

In this category we can find the majority of the identified taxons, 36: *Quercus robur* L., *Acer platanoides* L., *Fraxinus ornus* L., *Corylus avellana* L., *Sambucus nigra* L., *Adonis vernalis* L., *Polygonum hydropiper* L., *Prunus spinosa* L., *Rosa canina* L., *Malus silvestris* (L.) Mill., *Pyrus pyrasyster* (L.) Burgsd., *Amorpha fruticosa* L., *Lotus corniculatus* L., *Medicago falcata* L., *Melilotus officinalis* (L.) Pall, *Trifolium campestre* Schreb., *T. hybridum* L., *T. pratense* L., *Carum carvi* L., *Eryngium campestre* L., *Viola odorata* L., *Primula veris* L.em.Huds., *Calystegia sepium* (L.) R.BR., *Anchusa officinalis* L., *Symphytum officinale* L. ssp. *officinale*, *Mentha longifolia* (L.) Nath ssp. *longifolia*, *Prunella vulgaris* L., *Salvia pratensis* L., *Teucrium chamaedrys* L., *Dipsacus laciniatus* L., *Scabiosa ochroleuca* L., *Arctium lappa* L., *Centaurea scabiosa* L., *Cichorium intybus* L., *Cirsium vulgare* (Savi) Ten. and *Taraxacum officinale* Weber.

(iv)The plants of a small apiarian importance (15.23%). In this category are included seven

species: *Polygonum aviculare* L., *Filipendula vulgaris* Mch., *Heracleum spondylium* L., *Pimpinella saxifraga* L., *Althaea pallida* W.et K., *Galium verum* L., *Inula britannica* L.

CONCLUSIONS

In time, the localities of the Sibiu county were differently investigated from botanical point of view. Apoldul de jos is among 40 localities in the Sibiu county, where the floristic potential was studied only in a small proportion, of 10-20%.

In the Apoldul de Jos zone they were identified 46 vegetal taxons with obvious implications in the beekeeping. These belong to 19 botanical families: Fam. Fabaceae (9 taxons), Fam. Rosaceae and Asteraceae (6 taxons each of them), Apiaceae, Lamiaceae (4 taxons each of them), Polygonaceae, Boraginaceae, Dipsacaceae (2 taxons each of them).

A number of 11 botanical families have only one representative: *Fagaceae*, *Aceraceae*, *Oleaceae*, *Betulaceae*, *Adoxaceae*, *Ranunculaceae*, *Malvaceae*, *Violaceae*, *Primulaceae*, *Convolvulaceae* and *Rubiaceae*. The botanical study certified that the melliferous base of the studied area is built by taxons in the spontaneous and sub-spontaneous flora.

From the point of view of the apiarian importance, the melliferous species identified in this area belong to the four categories: species with a very large apiarian importance, (2.17%), species with a large apiarian importance (4.34%), species with a medium apiarian importance (78.26%) and species with a small apiarian importance (15.23%).

The floristic potential of zone could be found in the proportion of 84.77% in the first three categories, a fact that encourages the inhabitants towards the activity of beekeeping.

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