

## HONEY PLANTS OF FOREST LANDS IN THE NORTH-WEST RUSSIA

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### Abstract

The total area of Russia forest resources is more than 900 thousand hectares and half of those resources are suitable for the organization of forest apiaries. The studied objects were covered and uncovered with forest stand lands in the ecological condition of North-West Russia. Results of the researching shows that the number of species, their occurrence and projective cover in different land categories are significantly unequal. Biodiversity of the uncovered forest lands is always richer than under the canopy of the forest stands of any type, any structure and any crop density. Our research also shows that the species composition of honey plants depends first of all on the growth conditions and category of forest land.

**Keywords:** honey , honey plants,, apiculture, bee products.

### Introduction

More than half of Russian forest resources are suitable for the organization of forest apiaries. According to the forest inventarisation (01.01.2012), the total area of Russia forest resources is more than 900 million hectares. Russia takes first place in the world among melliferous territories. The main parts of apiaries are located on the territory that belongs to the forest lands. Honey productivity of forest lands is significantly different in different zones and areas, and the main reason is the biodiversity of melliferous plants.

In Russia, the annual honey production is more than 55 million kg (Statistical Yearbook... 2008-2011.), and the total population of Russian Federation, according to the report of population census 2012, is more than 143 million people. Therefore in average per person daily amount of honey is no more than 1 g. In many European countries, the average consumption of honey is 7-10 grams per day (Nygren et al., 2006; Wong et al., 2001; FAO, 2001). This is despite the fact that the respective resource potential of the Russia is much higher than European (Grjazkin & Smirnov, 2008).

The study objects were honey plants growing on the covered and uncovered forest lands (by honey plants we mean the plants that provide nectar and pollen)

### Material and methods

Detailed researches were carried out in North-West Russia (Leningrad region) in period from March to October 2012. At the same time we take into account the honey and beebread plants separately. Accounting of honey plants was performed by selectively statistical method: the circular areas of 10 m<sup>2</sup> were placed one by one, touching each other, in three or more different rows, throughout the experimental objects. The sample magnitude must be at least 2% of the total subject area (Grjazkin, 1997). During the empiristic works the plants were differing by life forms such as herbaceous plants, sub-shrubs, shrubs and trees. For assessing the resources of honey plants were used the existing regulations (Rules for

using of forests for agriculture ..., 2007; Manual Accounting and evaluation of secondary forest resources ..., 2003).

### Results and Discussion

Results of the study show that the number of species, their occurrence and projective cover is significantly different by land categories. On the uncovered forest lands their number is always greater than under the canopy of the forest stands of any type, any structure, and any completeness. This is due to the fact that on the glades, clearings and burnt areas there is large proportion of helophytes and ruderal species (weeds).

Accordinging the fact that the amount of honey plants is very large, a calendar of their bloom is highly extended - from March to October. Following that fact the total number of blooming species and the proportion of honey plants significantly changed monthly (table 1).

Table1. Dynamics of honey plants by month and their distribution on life forms

Months	The total number of blooming plant species	The honey plants by live forms		
		Woody plants	Semifrutexes	Herbaceous plants
March	3	3	no	no
April	11	4	no	4
May	32	2	5	12
June	54	2	2	19
July	36	1	1	15
August	28	1	1	6
September	17	no	1	5
October	3	no	1	3

The first blooming honey plants (the second or third decade of March) are represented by different types of willows. Later, in April blooming hazel (*Corylus avellana L.*) and alder (*Alnus glutinosa L.*); and from the grass cover – primrose (*Primula veris L.*), coltsfoot (*Tussilago farfara L.*). In May, the number of blooming honey plants increases several times, and there maximum number in the ecological conditions of North-West Russia was observed in June and in the first half of July. The most late blooming honey plants are white nettle (*Lamium album L.*) and red deadnettle (*Lamium purpureum L.*), tufted vetch (*Vicia cracca L.*) and common vetch (*Vicia angustifolia L.*), common knotgrass (*Polygonum aviculare L.*) and heather (*Calluna vulgaris L.*). *Calluna vulgaris* is also the longest-blooming species in the Leningrad region.

The total number of plant species accounted for the entire observation period is 160. Out of them 16 species belongs to the woody plants (only 5 species are honey plants: honeysuckle (*Lonicera xylosteum*), maple (*Acer platanoides*), linden (*Tilia europea*), mountain ash (*Sorbus aucuparia*), wild cherry (*Prunus avium*). The pollen collection carried by bees, mainly collecting from willow and hazel. The shrubs are represented by 6 species. The main part of shrubs concerns to the honey plants, and the primary honey plant from this group is the *Calluna vulgaris L.*

According to the majority of apiarists, the largest honey production from all forest grass species in the environmental conditions of North-West Russia has one species – willow-herb (*Chamerion angustifolium*). The time of blooming willow-herb is coinciding with the maximum of honey flow in whole this region.

Our research found that the species composition and biodiversity of honey plants in the first place depend of growth conditions and of the category of forest land (Gryazkin & Smirnov, 2008). Species composition of honey plants at the uncovered forest lands is more abundant than under the canopy of tree stands, regardless of their performance.

The results indicate that the largest number of honey plants is founded on the burned areas and forest clearings (table 2).

Table 2. The number of honey plant species, according to the category of land

Forest land	The total number of plant species	The number of honey plant species
1.The wood sorrel spruce forest	25	17
2. The wood sorrel birch forest	29	19
3.The bilberry pine forest	24	14
4.The bilberry scrub forest	21	12
5. The bilberry birch forest	24	15
6. Clearing 3 years ago	33	21
7. Clearing 5 years ago	38	22
8.The burned-out forest areas 5 years ago	52	25
9.The glade	50	24

This is consistent with data from other researchers (Petrick et al., 2005; Sharashkin et al., 2005; Wong et al., 2001). It is known fact that in forest apiculture is better to use clearings and burnt areas only 3 years after forest management activities or wildfire (Gryazkin & Smirnov, 2008; Petrik et al., 2005; Sharashkin et al., 2005).

### Conclusion

Research shows that the species composition of honey plants in the first place depends on growth conditions and the category of forest land. At the uncovered forest lands species composition of honey plants is more abundant than under the canopy of tree stands, irrespective of the characteristics of forest plant communities.

From the total number of recorded species, only 58 can be attributed to the honey plant (these types are visited by bees). Out of them 4 species belongs to the woody plants but the most pollen producers of them are willow and hazel. From 6 species of semifrutexes 4 refers to honey plant and the main honey plant of this group is *Calluna vulgaris* L. The largest honey production from all herbaceous plants in the condition of North-West Russia has one species – willow-herb.

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