STUDY ON THE EVALUATION OF HONEY POTENTIAL IN THE TĂCUTA COMMUNE AREA, VASLUI COUNTY

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Abstract

The current paper represents a study accomplished on the territory of Tăcuta commune, in Vaslui County, to estimate the honey potential of the area. The results showed that here lives a spontaneous, diversified, and cultivated flora, among which exist also species of honey interest (acacia, linden, rapeseed, sunflower, etc.); they can provide up to 153 tons of honey, which would ensure conditions for the maintenance of 1260 stationary bee families. The area can also assure good conditions for capitalizing on the honey potential by pastoral beekeeping, especially for: acacia harvesting, where could be moved up to 3000 hives, linden harvesting, where could be moved up to 2700 hives, and sunflower harvesting, where could be moved up to 970 hives.

Key words: *potential, honey, hives, bees*

INTRODUCTION

Romania benefits from an impressive melliferous potential, with a highly diverse flora consisting of species that bloom from March to October. These plants provide both maintenance and production nectar flows.

To capitalize on these nectar sources, beekeepers need detailed information about melliferous sources in various regions of the country to implement the most suitable approaches. Thus, depending on numerous factors that need to be considered (the number and strength of bee colonies, the estimated honey yield, transportation distance, fuel costs, etc.), many beekeepers find it profitable to move their apiaries to pastoral areas in certain regions of the country, while for others, it is more cost-effective to utilize local nectar flows.

Knowledge of the melliferous base in a given area, including the exact flowering periods of bee-forage plant species, as well as potential nectar flow gaps, is a crucial factor in implementing profitable, intensive beekeeping practices. For this reason, this subject has been, and continues to be, the focus of various studies and research. [1-6]

MATERIAL AND METHOD

The research was conducted in the area of Tăcuta Commune, Vaslui County, which proved to be a favorable location due to the presence of numerous melliferous species, both wild, in the meadows and forests, and cultivated, within agricultural lands.

In the forests of Tăcuta Commune, the predominant species is hornbeam (*Carpinus betulus*), associated with linden populations from three species: small-leaved linden (*Tilia cordata*), silver linden (*Tilia tomentosa*), and large-leaved linden (*Tilia platyphyllos*), predominantly found on the northern slopes of forested hills, along with wild cherry (*Cerasus avium*), sycamore maple (*Acer pseudoplatanus*), field maple (*Acer campestre*), ash (*Fraxinus excelsior*),

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field elm (*Ulmus campestris*), beech (*Fagus sylvatica*), pedunculate oak (*Quercus robur*), sessile oak (*Quercus petraea*), black poplar (*Populus nigra*), white poplar (*Populus alba*), and occasionally birch (*Betula verrucosa*). [7]

Additionally, there are shrubs such as blackthorn (*Prunus spinosa*), dog rose (*Rosa canina)*, raspberry (*Rubus idaeus*), hawthorn (*Crataegus monogyna*), elderberry (*Sambucus nigra*), cornelian cherry (*Cornus mas*), and hazel (*Corylus avellana*), which provide the locals with forest fruits and medicinal teas, and beekeepers with food for bee colonies.

A rich biocenosis inhabits the marshes near the Cuțigna River and the Larga, Recea, Dumasca, and Nastea streams. [8]

In the specialized agroecosystems of Tăcuta Commune, there are sunflower and vegetable crops. The area also features orchards and vineyards within its agroecosystems. [7]

The forested area in Tăcuta Commune covers a surface of 1,240.51 hectares, managed by the Dobrovăț Forest District, an administrative subunit of the Iași Forestry Directorate. The forest composition consists of 35% beech, 20% linden, 15% black locust, 10% oak, 10% hornbeam, and 10% ash, cherry, and maple. The most important bee-forage species are black locust and linden.

In the area of Tăcuta Commune, agricultural crops cover 6,024 hectares, of which 652.71 hectares are orchards, 44 hectares are vineyards, 215 hectares are meadows, 1,028 hectares are pastures, 162.34 hectares are vegetables, and the remaining area is occupied by grasses. [8]

To identify melliferous species of interest, parcel descriptions and pedo-stationary data were used, based on the Dobrovăț Forest District Management Plan and data provided by the Agricultural Department of the Tăcuta Commune Local Council, supplemented by fieldwork observations.

To determine the areas occupied by melliferous plants, land surfaces corresponding to the studied area were recorded according to their use (agricultural crops, orchards, meadows, forests, etc.). Isolated trees in the villages or along roads were inventoried by number, and then the surface they would occupy if grouped in a forest was calculated based on the average density per unit area. The surfaces occupied by forest species disseminated within the wooded area were deduced from data regarding their proportion in the forest structure. For diverse wild herbaceous flora found on various surfaces, the inventory was conducted based on the land use type.

By knowing the surfaces occupied by melliferous species and the melliferous potential of each species (as presented in the literature), the potential honey production of the studied area was calculated by multiplying the two. Conventionally, only one-third of this potential is considered, as it is known that during a beekeeping season, bees cannot fully exploit it due to unfavorable weather conditions and competition from other insects. [2, 6, 9, 10, 11]

To determine the necessary number of bee colonies to optimally utilize the melliferous potential of the area under stationary beekeeping conditions, the harvestable potential must be divided by the amount of honey collected by each bee colony in one year. Regarding this aspect, it is known that an average-strength colony accumulates about 120-130 kg of honey, of which around 90 kg is for self-consumption, 9-12 kg for swarm development, and the remaining 20-30 kg is marketable honey. [12]

Under pastoral beekeeping conditions, for the optimal use of the entire melliferous potential, depending on local conditions, standards for hive density per hectare are established for each melliferous species. [9,11]

RESULTS AND DISCUSSIONS

Using the documentation provided by the Dobrovăț Forest District, as well as the data collected during fieldwork, the melliferous potential of the forested area in Tăcuta Commune was estimated (Table 1).

Table 1 Melliferous potental of the forest area in Tăcuta commune

No.	Species	Area (ha)	Average Production (kg/ha)	Total Potential Production (kg)	Harvestable Production (kg)
1	Beech	434.35	20	8,687	2,895
2	Oak, sessile oak, hornbeam, ash, cherry, field maple	380.02	20	7.600,4	2.533
Total honeydew source		814.37	-	16.287,4	5.428
3	Linden	248.8	800	199.040	66.340
4	Acacia	177.34	1.000	177.340	59.113
Total nectar source		426.14	-	376.380	125.453
Total area		1.240,51	-	-	-
Total honey		-	-	392.667,4	130.881

The forest area of Tăcuta commune offers a harvestable melliferous potential of approximately 130 tons, of which over 125 tons can be obtained from linden (66.33 tons) and black locust (59.11 tons).

Linden and black locust are therefore the most important melliferous species in the area, having the highest melliferous potential (800-1000 kg/ha), despite their relatively small share in the forest structure, at 20% and 14%, respectively.

The remaining forest species, although accounting for around 66% of the forest, are of lesser importance, with a potential of only 5 tons, representing mainly a source of honeydew.

Based on data provided by the Agricultural Department of the Tăcuta Commune Local Council, as well as data collected during fieldwork, the melliferous potential of the agricultural area in the commune was also estimated (approximately 22 tons). The calculations used average values of the areas occupied by various agricultural crops over the past 10 years, and the area of the village itself was also included (Table 2).

Table 2 Melliferous potential of crops, pastures, meadows, and orchards

No.	Specification	Area (ha)	Average Production (kg/ha)	Total Potential Production (kg)	Harvestable Production (kg)
1	Sunflower	487.27	60	29.236	9.744
2	Rapeseed	29.56	40	1.182	394
3	Vegetables	162.34	50	8.117	2.705
4	Orchards	652.71	20	13.054,2	4.351,4
5	Vineyards	44	5	220	73.33
6	Meadows	215	50	10.750	3.583,33
7	Pastures	1.028	5	5.140	1.713
Total area (ha)		2.618	-	67.699,2	22.564,06

According to the values presented in Table 2, the largest quantities of honey can be obtained from sunflower crops, 9.74 tons (43.18%), which cover approximately 19% of the agricultural area of melliferous interest. Significant amounts of honey can also be harvested from orchards, 4.35 tons (19.28%), and meadows, 3.58 tons (15.88%).

Across the entire studied area, the harvestable melliferous potential is approximately 153.44 tons (Figure 1).

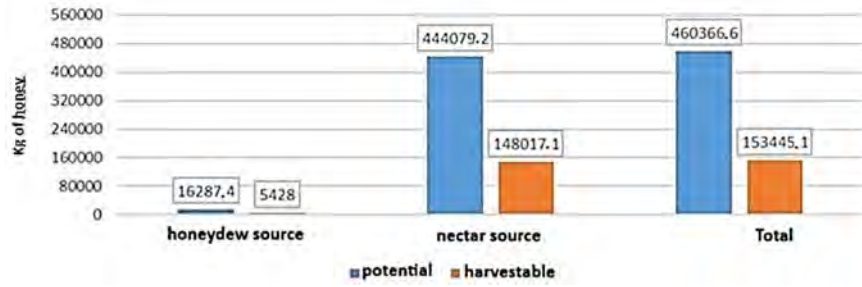

Fig. 1 The melliferous potential of Tăcuta commune

Regarding the stationary beekeeping, assuming a 20% increase in bee colonies and a honey production yield of 20 kg per colony, the studied area could optimally support around 1,290 bee families. According to the records of the Agricultural Department within the Local Council of the Commune, 1,450 bee families were registered at the time of the study, indicating a slight shortage in providing sufficient foraging resources for these colonies. This shortage, especially if higher production levels are desired, involves that some beekeepers move their hives to other regions richer in melliferous sources.

In theory, under the practice of migratory beekeeping, the area could accommodate the relocation of approximately 480-970 hives for sunflower foraging, 1,490-2,730 hives for linden, and 2,480-3,190 hives for acacia.

CONCLUSIONS

In the Tăcuta commune area, valuable melliferous species are found, such as acacia (177.3 ha), linden (248.8 ha), and sunflower (487.3 ha).

The estimated harvestable melliferous potential in Tăcuta commune is approximately 153,445 kg of honey.

Under stationary beekeeping conditions, with a honey production of 20 kg per bee family, the area can optimally support up to 1,290 bee families.

In migratory beekeeping conditions, to fully exploit the melliferous potential, the area could host up to:

-3,190 hives for acacia foraging (59,113 kg of honey),

-708 hives for linden foraging (66,340 kg of honey), and

-970 hives for sunflower foraging (9,744 kg of honey).

Since the number of bee families in the area exceeds the optimal level, to ensure their proper development and achieve satisfactory honey production, migratory beekeeping is necessary. This involves moving hives to areas with extra foraging resources outside the studied area.

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