

Kolbina L.M., Nepeivoda S.N., Ilyasov R.A., Poskryakov A.V., Nikolenko A.G. Comparing the methods of race determination bee-colonies under global crossbreeding of bees. Materials of international conference «XLVI Naukowa konferencja pszczelarska». Puławy. 2009. P. 37-38.

INSTYTUT SADOWNICTWA I KWIACIARSTWA  
ODDZIAŁ PSZCZELNICTWA  
*PSZCZELNICZE TOWARZYSTWO NAUKOWE*

---

## **XLVI Naukowa Konferencja Pszczelarska**



MATERIAŁY z KONFERENCJI

---

Puławy, 10 - 11 marca 2009 r.

Table 1

Number of tested queens on testing stations.

Year	Number of colonies	
	own	with tested queens
2006	73	27
2007	153	68
2008	250	88

Table 2

Evaluation of queens on TS.

Year	Productivity prop.		Reproduction properties				Accompaniments				Sanitary properties					
	Honey prod.		Overwintering		Colony strength		Stinting		Schwarming		Hygienic test		Varroa-tolerance		Nosema infest. %	
	Apiary	TS	Apiary	TS	Apiary	TS	Apiary	TS	Apiary	TS	Apiary	TS	Apiary	TS	Apiary	TS
2007	79,7	64,3	3,7	3,3	3,3	3,4	3,4	2,8	3,7	3,4	20,5	29,5			12,0	0
2008	43,2	43,0	2,9	3,6	3,2	3,4	3,5	3,1	3,5	4,0	20,1	24,5			15,3	21,0

## COMPARING THE METHODS OF RACE DETERMINATION BEE-COLONIES UNDER GLOBAL CROSSBREEDING OF BEES

Lidia Kolbina<sup>1</sup>, Sofia Nepeivoda<sup>1</sup>, Rustem Ilyasov<sup>2</sup>,  
A. Nikolenko<sup>2</sup>, A. Poskruykov<sup>2</sup>

<sup>1</sup>The Udmurt State Scientific Research Institute of Agriculture, Izhevsk, Udmurt Republic  
e-mail: [lidakolbina@vandex.ru](mailto:lidakolbina@vandex.ru)

<sup>2</sup>The Institute of Biochemistry and Genetics, Ufa  
e-mail: [apismell@hotmail.com](mailto:apismell@hotmail.com).

In our research the sample of 63 bee-families of 11 apiaries of 6 regions of Udmurtia Republic was used. In this research we used morphometric and genetic methods. Genetic research was carried out in common with institute of biochemistry and genetics of Ufa scientific center Russian Academy of Sciences. The basis of genetic analysis was the polymorphism of intergenic locus COI-COII of different races of bees (table 1).

The results of both methods coincided more than by 66% in Mozhginskiy region, indiametrical opposition with Sharkanskiy region. This allows to choose confidently only the one population of *A.m. mellifera* that habits in Mozhginskiy region, all other bees were strongly crossbreded.

Table 1

The results of the study of bee colonies by genetic and morphological methods.

Region	Colonies	Structure locus COI-COII	Number of colonies with the structure locus COI-COII PQQ	Number of colonies with morphometric parameters <i>A. m. mellifera</i>
Glazovskiy	2	PQQQ	0	0
Sharkanskiy	14	PQQQ, PQ, Q	8	3
Zavyalovskiy	17	PQQ, Q	4	3
Malo-Purginskiy	25	PQQQ, PQQ, PQ, Q	20	4
Kamarskiy	5	PQQ, PQQQ	2	0
Mozhginskiy	9	PQQ, PQQQ	6	5

Besides all its advantages, genetic method has serious weakness. The native race of the bees of Udmurtia Republic is *Apis mellifera mellifera*, and brought bee-families of other races were the small part in general bees of Udmurtia Republic. In result the most part of crossbreeding of bee-colonies was from the male line, which genetic method can not consider. On other hand, high variability of morphological characteristics, that appear as results of global crossbreeding, led to the effect that some of hybrid bee-families have figure of *A. m. mellifera* race. Therefore, reliable results can be obtained only by using both morphological and genetic methods of analysis.

---

## USING THE METHOD FOREL FOR DETACHMENT SIGNIFICANTLY DIFFERENT GROUPS OF BEES

Lidia Kolbina, Sofia Nepeivoda, Antonina Nepeivoda

The Udmurt State Scientific Research Institute of Agriculture, Izhevsk, Udmurt Republic  
e-mail: [lidakolbina@vandex.ru](mailto:lidakolbina@vandex.ru)

In the research process we faced the problem of the division of bee-families into significantly different groups. To our purpose we used the FOREL method of taxonomy, which had been written on the programming language C++. Taxonomy was conducted in the 14-dimensional space.

As a result, under  $r=0,1$  we managed to detach the three basic types of bees, which include 90,43% of bee-families (table 1). The first, the largest, type ( $\alpha$ ) included 61,70% of bee-families, the second ( $\beta$ ) — 18,09%, and the third ( $\gamma$ ) — 10,64%.