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RESEARCH OPINIONS IN ANIMAL & VETERINARY SCIENCES

Morphometric analysis of the autochthonous honeybees in Tajikistan

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Abstract

With the help of these investigations, the honeybees distribution boundaries "Apis mellifera", the farthest eastern border of which had been reported to be as far as Sistan and Baluchestan is now shifted to Tajikistan. A morphologic analysis carried out on Tajiki's bees in contrast with the other breeds reveals the distinction between Tajiki's bees with the other subspecies. This distinction can be traced back in the climatic impact of the distribution area of these bees. In this research it was determined that bees of Tajikistan have closer relations with the subspecies of meda of Iran and honeybees of Turkmenistan than with any other subspecies. Quite extensive natural boundaries, high mountain ranges, outstretched plains and deserts and a distinct climatic difference within a wide geographical distribution of subspecies of Meda have brought about an outstanding variation in their appearance inside the population of Meda in various regions as far as the environment is concerned. These changes are made to the extent that some independent ecological and geographical races were the result, as has been certified in the experimental observations carried out on Tajiki bees "Apis mellifera tajica.

Keywords: *Apis melliferal*; meda; Tajikistan; distribution

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Introduction

As regards morphologic-statistical analysis of Tajikistan honeybees, due to certain political issues in the past along with the question that whether or not Tajiki honeybees could be considered the farthest-distributed eastern species of *Apis mellifera*, we have no reliable data. The farthest eastern distribution of subspecies Meda honeybees in Iran has been reported in Kerman province and later on in Sistan and Beluchestan ((Ruttner et al., 1985&2000; Pourelmi and Fuchs, 2008). The objective behind these investigations is first morphology of Tajiki honeybees, native to Tajikistan and the confirmation of the affinity between these native honeybees and any of the Mellifera species and the original area of their distribution.

Materials and Methods

In this study, 19 bee samples from Tajikistan, 13 samples from Turkmenistan, 71 from different regions of Iran, 13 from Anatoly (Turkey), 19 from Syria, 7 from Iraq, 32 from Italy, 29 from Caucasia, 13 samples from Carnica, 13 from Siberia and 10 samples from *Mellifera mellifera* were brought into analysis (total 239). For an exhaustive consideration of a honeybee's colony and conclusion of some roughly-estimated criteria concerned with the total variance of queen Mother's pheno-type and a variety of fathers, for each sample we had to take at least 10 workers into consideration. In order to delve into the morphology and selection of the parameters, a standard international approach from Ruttner et al. (1978) was employed. In this study, by and large, 51 parameters in each worker will be taken into consideration. A fraction of these parameters will be employed in the selection of their ancestors and their racial recognition (Ruttner, 1983). Among 51 parameters, 42 parameters including body size, characteristic features such as hair's length, extremities, size and characteristic features of the front wings, body's colour and nine other parameters can be incorporated into the index of the parameters. The

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whole process of morphometric-statistical analysis research has taken place in the International Institute of the Beekeeping Oberursel of the University of Frankfurt am Main (Germany).

Results and Discussion

The result obtained from measuring the parameters pertaining to the gathered honeybees from Tajikistan reveals that Tajiki honeybees have shorter hair (Syrian honeybees are excluded) in proportion to the other species. Their bodies' colour is brighter than that of Caucasica, Carnica, *Mellifera mellifera* and stands side by side to the Iranian breed (Meda) and Turkmenistan honeybees. Tajiki's honeybees are bigger than their Iranian counterparts in the leg but smaller than the other breeds that have been drawn into calculation. The Tajiki's honey bee's body in proportion to the legs is bigger than the Syrian's but smaller than the other breeds (Table 1). The wing's index, compared by the other breeds, is bigger. In Factor Analysis of Tajiki's bees as contrasted with the other subspecies of honeybees, as well as a discriminant-analysis, it is observed that Tajiki honeybees have formed a closed and isolated pile from the other breeds almost in the midway and stand very closely side by side with Turkmenistan's and Iran's (Meda) counterparts.

In Factor and Discriminate-Analysis, the total number of the bee samples collected from Tajikistan as contrasted with the other samples from an isolated closed pile, which approximates the Iranian subspecies (Meda) from Turkmenistan and stands quite at a distance from the Anatolian, Armenian, European and Siberian honeybees.

Cluster-analysis from morphometry among Tajiki sample bees is vividly observed as contrasted with the other breeds – in other words, Tajiki honeybees within the Mellifera species, stand close to their Turkmenistani counterparts. Thus, it reinforces the assumption that the distribution of the Iranian sub-species of "Meda" has

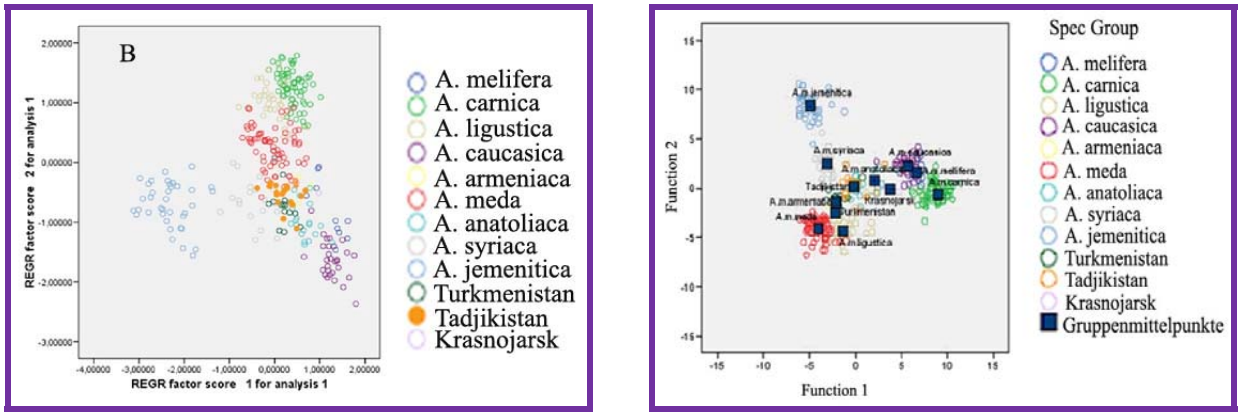

Fig 1: Canonistic discriminate function and factor-analysis.

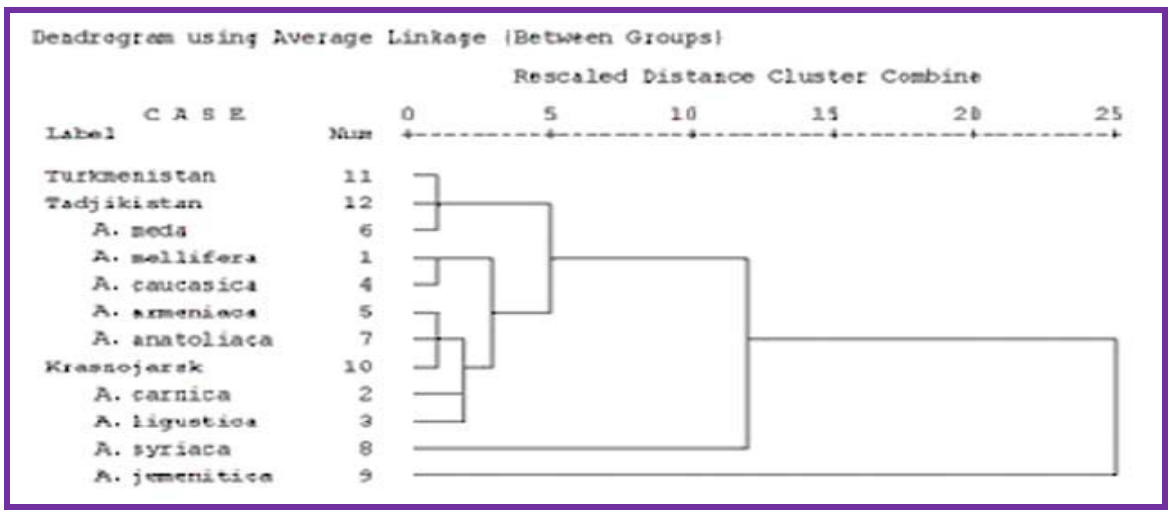

Fig 2: Cluster-analysis from morphometry

Table1: Means and standard deviations (Mean± SD) of some important traits in honey bee breeds compare to Turkmen honey bee

Race	Hair length	Body size	Complete leg	Cubital index	Pig. T3
A. ligustica	27.66±1.89	439.12±9.87	796.82±10.84	2.54±0.19	8.00±0.60
A. caucasica	33.54±3.26	454.31±7.52	826.93±14.97	2.09±0.15	3.60±0.86
A. armenica	32.28±2.00	455.59±5.43	812.33±5.50	2.69±0.13	8.8±0.26
A. meda	27.95±2.79	435.34±10.82	781.89±15.31	2.50±0.23	8.46±0.57
A. anatolica	29.15±2.48	477.93±5.94	813.98±10.09	2.16±0.18	4.77±0.88
iraqis	27.93±1.84	429.40±11.31	776.09±12.69	2.51±0.23	8.92±0.24
A. turkmenistan	24.97±1.91	421.73±8.22	787.94±9.74	2.16±0.21	8.45±0.35
A.. mellifera	37.86±6.61	457.89±9.87	822.16±14.88	1.80±0.20	1.84±0.70
A. carnica	29.76±2.41	451.78±5.82	805.64±12.99	2.69±0.19	1.71±1.01
A. Tajiki	23.76±2.55	431.00±4.89	802.50±14.91	2.16±0.16	7.54±1.20
A. syriaca	22.27±3.77	419.70±13.20	787.84±14.44	2.24±0.29	8.56±0.43

been stretched out as far as Central Asia to Tajikistan and Turkmenistan. And over the years and centuries, under the impact of a varied environment, they have evolved into independent geographical races (ecological races), the consequence of which is advent of morphologic changes as far compatibility with their natural habitat is concerned – and Tajiki honeybees are a concrete example of this sort.

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