

PARTIAL RESULTS REGARDING THE GENETIC ANALYSIS OF SHAGYA ARABER HORSE FROM RĂDĂUȚI STUDFARM: REPRODUCTIVE ISOLATION AND AGE STRUCTURE

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Abstract

This study is a part of an ample research concerning the genetic analysis (history) of Shagya Araber horses from Rădăuți studfarm. The genetic analysis studies are a part of Animal Genetic Resources Management because just start of them we elaborate the strategies for inbreeding management. This study has as purpose to present two important aspects of genetic analysis: reproductive isolation level and age structure. This parameters has a capital importance in animal breeding because there has a directly influence in animal population evolution.

The reproductive isolation situation was quantified using the relation elaborated by S. Wright in 1921. The age structure situation is based on the age distribution histogram.

The analysis show us that the Shagya Araber horses from Rădăuți stud is a reproductively isolated population and have its own evolutionary path. Age structure is not balanced with negative repercussions on generation interval.

Key words: Shagya, Araber, genetics, reproductive isolation

INTRODUCTION

This study is a part of an ample research concerning the genetic analysis (history) of Shagya Araber from Rădăuți studfarm. The genetic analysis studies are a part of Animal Genetic Resources Management because just start of them we can elaborate the strategies for inbreeding management [3]. This study has as purpose to present two important aspects of genetic analysis: reproductive isolation level and age structure. This parameters has a capital importance in animal breeding because there has a directly influence in animal population evolution.

The population acceptance criteria are four: reproductive isolation, morphological and physiological differences, environmental requirements and genetic size [4]. The reproductive isolation level is the most important criteria for population acceptance, the other three being in according to them [1]. This parameter is very important because only

reproductive isolated populations have an own evolution, in contrary they are influenced by evolving of immigrants populations.

The age structure have a double importance: for exploitation because influenced directly average age, and on the other hand, for animal breeding because is influenced the generation interval and population variability [2].

MATERIAL AND METHOD

The biological material are represented by nine sire stallions and fortythree mares, Shagya Araber breed, representing the entire reproductive nucleus from Rădăuți stud farm at this time (11.10.2010).

The reproductive isolation level was quantified using the follow relation [1]:

$$C.I.R. = \frac{AA - AB + B}{AA + AB + B}$$

where: AA – number of individuals accepted for reproduction in analysed interval with

both autohtones parents; AI – number of individuals accepted for reproduction in analysed interval with one autohtone and one immigrant parent; II – number of individuals accepted for reproduction in analysed interval with both immigrants parents.

The age structure can be described by weight of different age categories from entire population [4]. The age structure is expressed in years.

RESULTS AND DISCUSSIONS

The results regarding reproductive isolation coefficient (RIC or CIR) are showed in table 1.

The age structure for Shagya Araber horse from Rădăuți stud farm is presented in table 2 and in the figures 1 and 2.

Table 1 – The reproductive isolation coefficient values

Specification		No.	Immigrants (I)	Parents			R.I.C.
				AA	AI	II	
Reproductive nucleus (RN)	♂	9	-	9	-	-	+1,000
	♀	43	-	43	-	-	+1,000
	Total	52	-	52	-	-	+1,000
Parents of RN	♂	20	-	20	-	-	+1,000
	♀	41	-	41	-	-	+1,000
	Total	61	-	61	-	-	+1,000
Grandparetns of RN	♂	31	-	31	-	-	+1,000
	♀	54	-	54	-	-	+1,000
	Total	85	-	85	-	-	+1,000

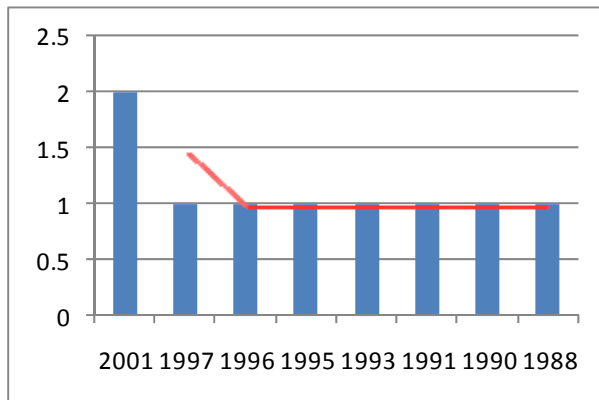


Figure no. 1. Sire stallion age structure

Table 2 – Shagya Araber horse age structure in Rădăuți stud farm

Sex		Average age		
F	43	10,12 ± 0,60	15,33 ± 1,45	
Birth year	1988	N	1	
		%	11,11	
	1990	N	1	
		%	11,11	
	1991	N	1	
		%	11,11	
	1992	N	3	
		%	6,98	
	1993	N	1	
		%	11,11	
	1994	N	2	
		%	4,65	
	1995	N	1	
		%	11,11	
	1996	N	1	
		%	11,11	
	1997	N	1	
		%	11,11	
	2000	N	13	
		%	30,21	
	2001	N	3	
		%	22,22	
	2002	N	3	
		%	6,98	
	2003	N	7	
		%	16,28	
	2004	N	4	
		%	9,30	
	2005	N	3	
		%	6,98	
	Total	9	M	

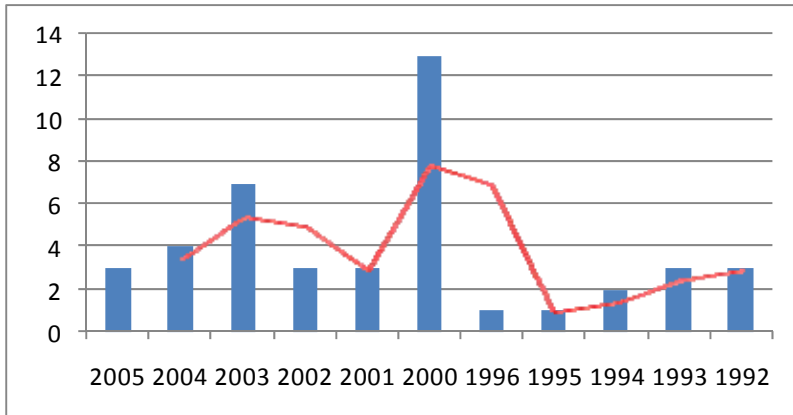


Figure no. 2. Brood mares age structure

The dates presented in table 1 reveal a big number of the fathers of the individs from actually reproductive nucleus due to superposed generations. Same data from table 1 reveals an complete reproductive isolation (R.I.C. = +1,000), a population with her own evolution and perfect distinct from other similar communities. From this point of view, the Shagya Araber population from Rădăuți studfarm could be considered as a genetic line within breed.

The age structure is unbalanced, and we can see that in table 1 and figures number 1 and 2, being improper for increasing the genetic progress. The sire stallions age structure can be improved only if the retained of the 2 stallions born in 2001 is not fortunately, and if the situation will be maintained. Weight of the older stallions categories (born in 1987 - 1997) determinate an average age, for this sex, at 15.33 years. This value increase the generation interval and decreasing the annual genetic progress.

Mares have also an unbalanced age structure, retained of the mares for reproduction nucleus having another criteria than the increasing the genetic progress.

CONCLUSSIONS

1. Shagya Araber horse from Rădăuți stud farm is a poulation with his own evolution and perfectly distinct for other similar communities.

2. The reproductive isolation value (+1.000) for Shagya Araber horse from Rădăuți studfarm indicate a population with completely reproductive isolation.

3. The population of Shagya Araber horse from Rădăuți stud farm could be considered as a genetic line within breed.

4. Sex ratio (1:4.78) does not disturb the evolution of population.

5. Regarding at the age structure, this is unbalanced, at both sexes, improper for increasing the annual effect of selection.

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