STUDY REGARDING THE MORPHOLOGY OF REPRODUCTION POPULATION OF PURE ARABIAN BREED FROM MANGALIA STUDFARM

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Abstract

Pure Arabian horse breed is one of the oldest breed found in the world, spread all over the Earth to contribute to creating and improving most of current horse breeds. It is considered a horse with a lively and obedient temperament, with special characters for gallop racing, endurance competitions and also for show events.

In Romania, Pure Arabian horse breeding is currently obtaining good results in Mangalia studfarm, opened in 1928. Here we can find valuable individuals from CYGAJ, EL IMAN, GAZAL, HADBAN, IBN GALAL, MERSUCH, NEDJARY and SIGLAVY BAGDADY genetic bloodlines.

The paper represents a morphological study, based on 92 adult horses, selected for reproduction at specific ranking activity in 2018 (9 sires, 27 public mount stallions and 56 mares).

The study was based on the main 3 body dimensions checked also in current criteria evaluation paper: height(154.77± 0.19 cm), thorax perimeter (182.35±0.58 cm) and cannon girth(18.98±0.06 cm), used for obtaining specific body indexes as dactilo-thorax index (10.41±0.03%), bone index (12.27±0.05%) and massiveness index (117.83±0.37%). The results prove that from this perspective, Pure Arabian breed standard is maintained in Mangalia studfarm.

Key-words: horses, mares, stallions, studfarm, body dimensions

INTRODUCTION

Pure Arabian horse breed is one of the oldest breed found in the world, founded over 4500 years ago and spread all over the Earth to contribute to creating and improving most of current horse breeds. They present a lively and docile temperament and special characters for gallop racing, endurance competitions and also show events. They are highly adaptive to climate changes and poor maintenance conditions. [2,9,11,14,16,17,18]

In Romania, the most valuable Pure Arabian horse population is reared in Mangalia studfarm, which has an experience for more than a century (founded in 1929); our country is a member of Arab Horse Organization (WAHO). Annually, in this studfarm, the horse population is assessed through ranking evaluation to keep only the most representative individuals for reproduction. [19]

In these conditions, the exterior is closely analyzed because a "pure breed" is studied. Therefore, this paper aims to contribute to the morphological aspects of Pure Arabian horse breed, regarding the main body dimensions calculated during the specific ranking evaluation (height, thorax perimeter and cannon girth).

MATERIAL AND METHOD

The biological material was represented by 92 adult horses from Pure Arabian breed, reared in Mangalia studfarm. These horses were selected for reproduction based on current criteria evaluation from 2018 and there was included a number of 9 sires, 27 public mount stallions and 56 mares.

In this study were analyzed the height, the thorax perimeter and the cannon girth,

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which were used to calculate three main body indexes like massiveness, bone index and dactilo-thorax index. The measurements were obtained using the zoo meter and the metric tape and for revealing the mentioned indexes there were used the following formulas: dactilo-thorax index=(canon girth/thorax perimeter)x100; bone index=(cannon girth/withers height)x100; massiveness index=(thorax perimeter / withers height) x 100 [2,3,4,5,6,7,8,10,13].

Data retrieved after processing the body measurements and the indexes were statistically interpreted using the classical methods like arithmetic mean, standard deviation of mean and analysis of variance[1].

RESULTS AND DISCUSSIONS

Data obtained by processing the specific measurements are presented in the following tables. In table 1, there are described the average values of withers height, in cm, for mares, sires and public mount horses.

Table 1 Average values of withers height for all horse categories (cm)

Specification	Mares	Sires	Public mount stallions	Total number of horses
n	56	9	27	92
$\bar{x}$	154.75	154.44	154.92	154.77
s^2	3.97	7.52	1.07	3.38
s	1.99	0.72	1.03	1.84
$\pm s\bar{x}$	0.26	0.24	0.19	0.19
V%	0.12	0.47	0.66	1.2
MIN	150	150	152	150
MAX	160	159	156	160

The data obtained shows that the withers height had minimum and maximum values of 150 and 160 cm and an average value of 154.77 ± 0.19 cm for the whole horse population. These values are according to evaluation criteria, issued in 2008. The maximum value of 160 cm, which is the maximum limit for Pure Arabian horse breed, was found in only one case, at OMEGA mare, born in 2007, hold for reproduction probably for many valuable characters that she presents. The minimum value of 150 cm for whiter's height parameter was found at multiple individuals, mares and stallions as well.

For mares, the average value of wither's height was 154.75 cm and for stallions oscillated between 154.44 cm (sires) and 154.92 cm (public mount stallions).

As far as the coefficient of variation is concerned, the parameter wither's height was very homogenous for the population studied, the values obtained revealing a maximum of 1.2%.

In table 2, there are described the average values of thorax perimeter, in cm, for mares, sires and public mount stallions.

Table 2 Average values of thorax perimeter for all horse categories (cm)

Specification	Mares	Sires	Public mount stallions	Total number of horses
N	56	9	27	92
$\bar{x}$	180.62	184.88	185.11	182.35
s^2	28.78	83.12	8.88	31.96
S	5.36	9.11	2.98	5.65
$\pm s\bar{x}$	0.22	3.03	0.57	0.58
V%	2.97	4.93	1.60	3.1
MIN	171	172	178	171
MAX	195	200	190	200

The thorax perimeter registered absolute values of 171-200 cm, with an average value of 182.35 ± 0.58 cm and a coefficient of variation of 3.1% (which reveals that the population is homogenous regarding this parameter). The maximum value of 200 cm was found on RABI sire, born in 2009 and the minimum value of 171 cm was registered in case of 3 mares born in 2015 (ZULEIKHA, ZAFIRA and ZULAIDA).

Regarding the average value of thorax perimeter of stallions, the study revealed that sires registered a value of 184.88 cm, the public mount stallion a value of 185.11 cm and the mares only 180.62 cm.

In table 3, there are described the average values of cannon girth, in cm, for mares, sires and public mount horses.

Table 3 Average values of cannon girth for all horse categories (cm)

Specification	Mares	Sires	Public mount stallions	Total number of horses
N	56	9	27	92
$\bar{x}$	18.92	19.44	18.96	18.98
s^2	0.44	0.21	0.15	0.35
S	0.66	0.46	0.39	0.59
$\pm s\bar{x}$	0.08	0.15	0.01	0.06
V%	3.50	2.38	2.06	3.1
MIN	18	19	18.5	18
MAX	20	20	20	20

The absolute values found for cannon girth were 18-20cm, with an average value of 18.98 cm for the whole horse population. The coefficient of variation for this parameter was 3.1%, fact that revealed that the group was homogenous.

The minimum limit of 18 cm was registered at mares and the maximum limit was found in all other cases. At mares the average value of cannon girth character was 18.92 cm, at sires this value was 19.44 cm and at public mount stallions was 18.96 cm.

The average values for body indexes (dactilo-thorax index, bone index and massiveness index) are described in table 4.

Table 4 Average values of body indexes for all horse categories

Spec	Dactilo-thorax index				Bone index				Massiveness index			
N	Sires	Public mount stallions	Mares	Total	Sires	Public mount stallions	Mares	Total	Sires	Public mount stallions	Mares	Total
$\bar{x}$	9	27	56	92	9	27	56	92	9	27	56	92
s^2	10.53	10.24	10.48	10.41	12.59	12.24	12.23	12.27	119.66	119.48	116.73	117.83
S	0.15	0.05	0.08	0.12	1.42	0.06	0.08	0.15	14.71	3.62	4.18	12.73
$\pm s\bar{x}$	0.41	0.22	0.34	0.34	1.19	0.24	0.43	0.38	3.87	1.91	3.69	3.56
V%	0.13	0.04	0.04	0.03	0.39	0.04	0.05	0.05	1.29	0.36	0.49	0.37
MIN	3.93	2.14	3.24	3.32	9.45	1.96	3.51	3.16	3.23	1.60	3.16	3.02
MAX	11.04	10.52	11.69	10.52	12.82	12.82	13.33	12.57	125.78	121.79	121.87	125.78

Regarding the body indexes described in table 4, there can observed that the dactilo-thorax index had an average value of 10.41 ± 0.03% (the minimum value was 10% and the maximum value was 10.52%), the bone index had an average value of 12.27 ± 0.05% (the minimum value was 11.76% and the maximum value was 12.57%) and the massiveness index 117.83±0.37% (minimum 111.76% and maximum 125.78%). These values reveal a harmonious development and a fine-robust constitution of horses.

CONCLUSIONS

Data obtained in this study should be analyzed according to amelioration level applied in Mangalia studfarm and in Romania, generally speaking. Worldwide, lately there

were three directions in Pure Arabian horse rearing: endurance (strong horses with high stamina), gallop (speed horses) and events (horses for beauty shows) but in our country this practice is not available.

Therefore at qualification tests also gallop task exists, Mangalia studfarm does not raise Pure Arabian horse for this purpose. The lack of a strict specialization is the main reason why in ranking examination body dimensions (especially wither‘s height) can oscillate between very wide limits. If we witness a specialized horse rearing for every direction specified, a character manifestation could be needed and the selection criteria would be different.

Concluding the above informations we can affirm that at Mangalia studfarm, Pure Arabian horse population is framed between the literature limits and the available rules regarding the main body dimensions studied in this paper: wither‘s height, thorax perimeter and cannon girth.

Thus this paper concluded the following aspects: the average value of wither‘s height was 154.77±0.19 cm, the average value of thorax perimeter was 182.35±0.58 cm and the average value of cannon girth was 18.98±0.06 cm; regarding the dactilo-thorax index, it‘s average value was 10.41±0.03%, the average value of bone index was 12.27±0.05% and the average value of massivenes index was 117.83±0.37%.

Concluding all these aspects, we can affirm that the horse population reared in Mangalia studfarm is homogenous regarding studied characters and the data obtained are related to literature specification.

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