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## THE RESULTS OF IDENTIFICATION AND CHARACTERISATION OF THE DONKEY POPULATION IN ALBANIA

### ABSTRACT

Donkeys have lived for centuries in Albania, particularly in the coastal and hilly areas, helping man in his attempts to face the rough environment. Donkeys adapt very well to the severe conditions, but they're also strong, resistant, have modest feeding requirements and offer very good performance as a work and transport animal. These are the reasons that man has preferred donkeys more than other transportation animals, like horses and mules. The intensification of agriculture and the depopulation of remote rural areas have affected the diminishing economic importance of the donkey. The size of the donkey population is also decreasing. Nevertheless, the donkey continues to be an animal that is frequently found in the rural areas of Albania. The donkey population is estimated to be approximately 35,000 to 40,000 animals. To date, the donkey has not been the object of scientific study. The Albanian local donkey is a common breed originating from Nubia. The aim of this study was the identification and the phenotypic characterisation of the Albanian donkey population. Based on the investigations carried out in different regions, the Albanian donkey is described as a small animal, coloured grey, black, reddish or purple. Referring to the average morph-biometric traits, two different types were identified. The types are statistically, significantly different ( $P < 0.05$ ): wither height (98cm, 115cm), chest circumference (116.2cm, 131.6cm), body length (104.2cm, 120.6cm), chest depth (43.1cm, 48.2cm), chest width (24.2cm, 28.3cm), tibia circumference (12.5cm, 14.7cm), ear length (21.1cm, 27.7cm), body weight (97.3 kg, 154.7kg). The differences between males and females are not significant ( $P > 0.05$ ). To evaluate the differences between the two Albanian donkey types, the analysis of polymorphic blood proteins and DAN are necessary.

**Key words:** donkey, local breed, phenotypic characterization.

### INTRODUCTION

The number of donkeys in Albania are estimated to be around 56,000 (Statistical book and Technical Reports, 2011) . They are mainly distributed in the lowlands and the hilly regions of the country. Donkeys are essential for the livelihood of many families in rural areas. The donkey has been preferred over

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other animals, such as horses and mules, for its ability to adapt to severe conditions, its strength, resistance, modest feed requirements and very good performance as an animal for both work and transport. The donkey (Lat. *Equus asinus*) was domesticated by crossing specimens from the two presently living forms of the Nubian wild donkey (*Equus asinus africanus*) and the Somalian wild donkey (*Equus asinus somaliensis*). According to the declarations of Posavi, et al.2003, concerning the possible migration of the donkey in the south-west Mediterranean regions, the animal arrived on Albanian territory, precisely on the coast of the Adriatic Sea, owing to the development of trade connections between the civilisations of Persia, Egypt and Greece. Besides that the donkey had arrived in Albania together with the conquering peoples of Asia Minor and the far (Samimi, 1935). The present-day donkey is the result of natural selection more than from human choice. Its preservation occurred in the extremely harsh conditions of keeping and nourishment and this is the reason that it has a significantly lower and smaller body than the original species. The colour of the Albanian donkey is grey, black, reddish or purple. The local name is “gomari”.

The intensification of agrarian production and the economic-social movements in rural areas resulted in a significant decrease in the total number of donkeys. To date, the donkey has not been the object of scientific study.

The evaluation of morphological indices of the local donkey body conformation was the aim of this study. The data was used to judge the existence of donkey subpopulations with noticed differences in Albania.

## MATERIAL AND METHODS

### *Location*

The surveys were carried out in Elbasan, Kavaja and the Lushnja regions located in the central and coastal areas of Albania, as well as in the Devolli and Vlora regions located in the hilly and mountainous areas of south east Albania.

### *Data collection*

The statistical data from the annual report of Ministry of Agriculture, Food and Consumer Protection were used to evaluate the dynamics of the donkey population. A total of 170 donkeys were studied, from which 95 were in lowland, 39 and 36 were, respectively, in the hilly and in mountainous areas. For each animal the age, sex, the body colour, the size of the body frame and other body measures were determined. Body weight (BW) was calculated by using the given formula (Pejic, 1996):

$$BW \text{ (kg)} = \frac{CC^2 \times BL}{11877}$$

Where: CC- chest circumference, BL – body length

The owners were asked to respond to questions on the topics of management, health and work performance of their donkey.

The discriminate analyses were used to judge the level of differentiation between the donkey subpopulations farmed in the lowlands, hilly and mountainous regions (Statgraphics Centurion XV).

### RESULTS

The dynamics of the donkey and horse population size in Albania during the 1992-2010 period is presented in Figure 1. It could be seen that after 1994, the perissodactyls number has been continually decreasing. The population size was 2.8 times smaller in 2010 when compared with the population size in 1994. The diminishing number of horses and mules was the main cause of this decline. The number of donkeys was diminishing with a rate of about 1.7 times during the same period. This has increased the donkeys' percentage in perissodactyls structure after 2000. It was evaluated that in 2010, that donkeys constituted about 57% of the entire perissodactyl population in Albania, meanwhile in 1994, when the highest number of perissodactyls in the donkey population was noted to be only 34 %.

The diminishing number of the donkey population was accompanied by a change in the male to female ratio. (Figure 2). In the early 90s, the differences between male and female donkeys were small. In 2010, the number of male donkeys was evaluated to be 1.8 times greater than that of the female donkeys.

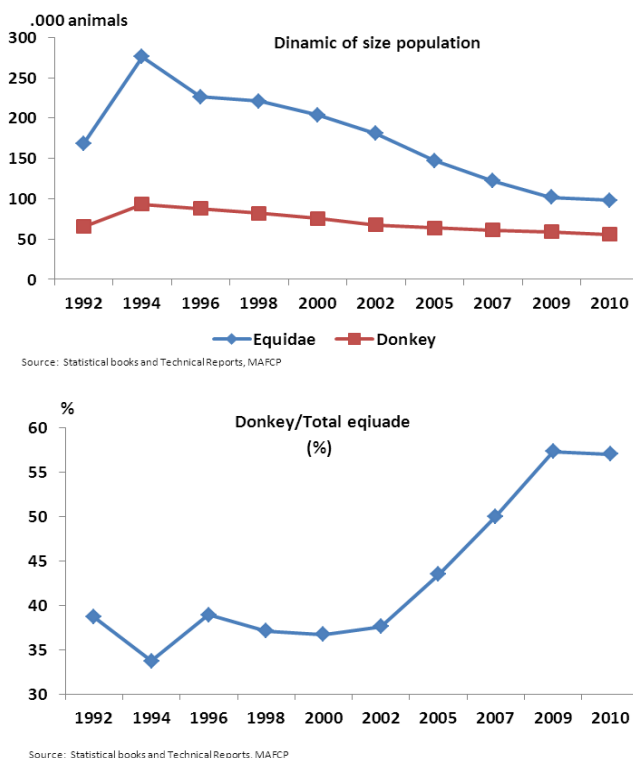


Figure 1. The dynamic of population size of equines

The highest number of donkeys was found in the hilly regions of Albania. It is evaluated that 35.4 % and 6.3 % out of the total donkey number are kept by rural families, respectively, in the lowlands and the mountainous regions. 6.3% (Figure 3).

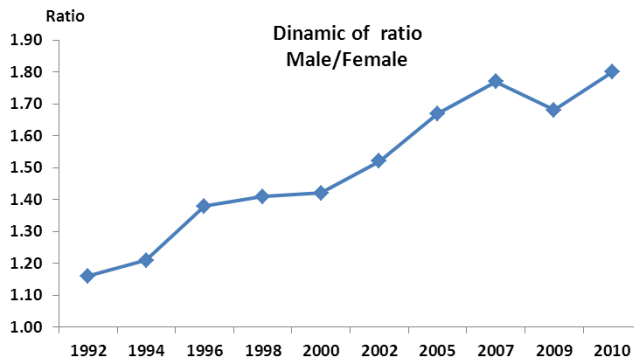
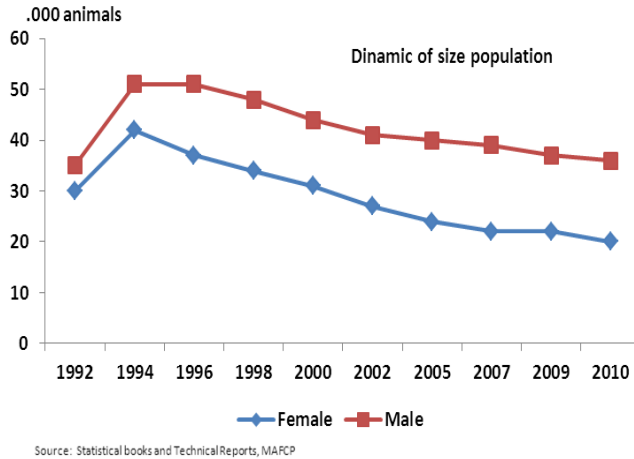


Figure 2. The dynamics of the population and male/female ratio

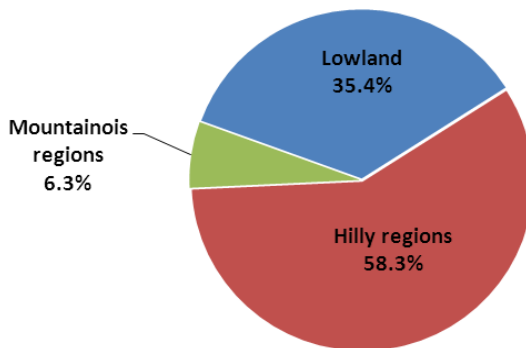


Figure 3. The Distribution of donkey population according to regions

The majority of the donkeys included in the study were aged between 2 and 7 years. Donkeys over the age of 10 are rarely seen on family farms. A relatively small number of donkeys younger than 2 years were observed (Figure 4).

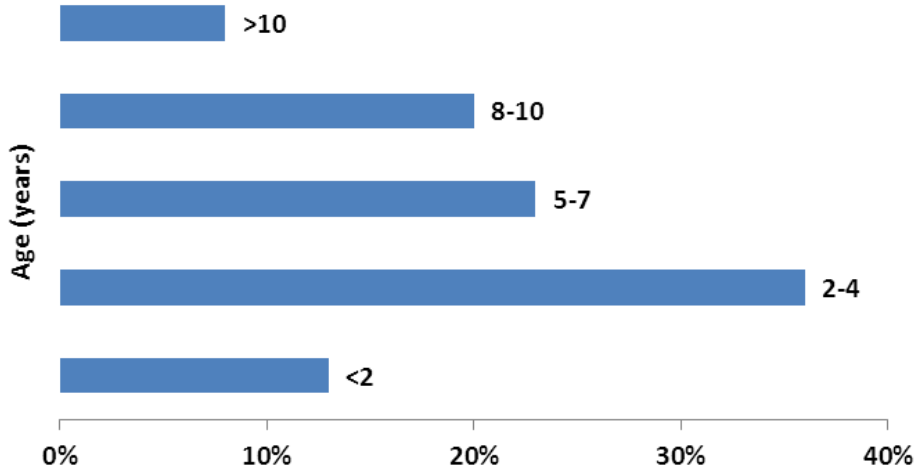


Figure 4. Age structure of donkeys

Most of the 66% of the interviewed farmers used donkeys as a pack animal or for other farm work (Figure 5). About 18% of them used donkeys for transport only and with cart and 16 % of them used donkeys for transport and other farm work. On average, one donkey per family farm is kept. Only 8 % of the interviewed farmers used to keep two or more donkeys.

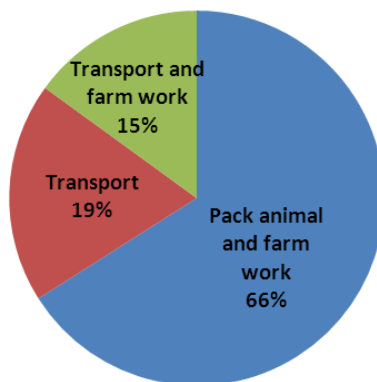


Figure 5. Reasons for keeping donkeys



Figure 6. Photos of some donkeys grown in Albania

The average evaluations of the different indices measured in donkeys are reported in Table 1.

Table 1. Donkey body measurements (cm)

Traits	Lowland regions	Hilly regions	Mountainous region	Total
Number of animals	95	39	36	170
Wither height	115.3±8.2 <sup>a</sup>	100.1±7.9 <sup>b</sup>	97.2±8.1 <sup>b</sup>	107.8±9.2
Body length	120.6±6.4 <sup>a</sup>	106.4±5.7 <sup>b</sup>	102.1±4.9 <sup>b</sup>	113.4±6.8
Chest circumferences	131.6±4.8 <sup>a</sup>	121.1±4.1 <sup>b</sup>	112.4±5.2 <sup>b</sup>	125.2±5.4
Chest depth	48.2±2.1 <sup>a</sup>	44.3±2.6 <sup>b</sup>	42.1±3.1 <sup>b</sup>	46.1±2.9
Chest width	28.3±1.3 <sup>a</sup>	25.3±1.7 <sup>a</sup>	23.8±1.1 <sup>b</sup>	26.7±1.8
Body weight (kg)	154.7±19.3 <sup>a</sup>	101.3±15.8 <sup>b</sup>	95.2±17.6 <sup>c</sup>	129.8±19.4

The distribution of analysed animals in the plane of two discriminate functions are presented in Figure 7.

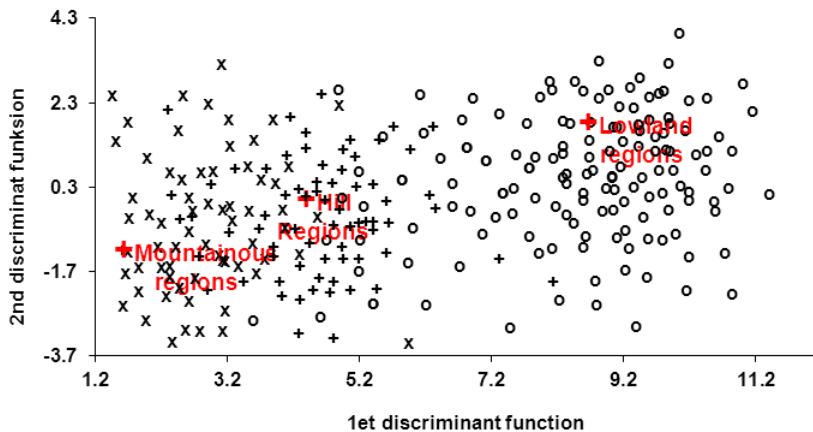


Figure 7. The scatter graph of the Albanian donkey commune populations, with centroids in the plane of the first two discriminate functions

## DISCUSSION

The donkey population is diminishing with a rate of 1.7 times, meanwhile the perissodactyls population is diminishing at 2.8 times in 1994-2010, which shows the farmers interest for this animal. This is because the advantages of using a donkey are higher than in other perissodactyls animals. The donkey is a relatively small animal with less feeding requirements than in horses and mules. It is a family animal with distinct qualities that help it to face difficulties. It is

strong, very resistant and suitable to perform work on a small family farm. The higher prices for mechanical work on a farm have pushed the farmers to use more animals in farm work. The farmers are more interested in keeping male donkeys because they are stronger than female ones. This is the reason that the male to female ratio has changed, especially after 2006, in favour of male donkeys.

About 93.7% of the donkey population is distributed in rural areas of the hilly and mountainous regions, because mules are more suitable for transport on rough mountainous terrain. The donkey is more suitable than a horse and a mule in the lowlands. It is a quiet animal that does not react to noisy motored vehicles moving in the rural streets of hilly and field zones.

Donkeys are not kept to produce meat and milk in Albania. This is the reason why only one donkey is kept in 90% of the cases, per family farm as a farm-working animal.

The survey's results show that Albanian farmers are more interested in keeping donkeys of a young age. The interviewed farmers explained that their preference had to do with the vitality and the capability of young animals and that they can perform a lot of work.

Robinson J. (2003) classified donkeys by size: from the Miniature Mediterranean (90 cm), Standard (120 cm), Large Standard (140 cm), and Mammoth (140 cm). The average donkey size included in this study suggests that the Albanian donkeys could be classified in the "standard type" group.

Comparing the average data of the evaluated body indices of Albanian donkeys with those from Montenegro and Croatia have reported by other researchers in the region (Ivankovic, A. et al. 2000; Markovic, B. and Markovic, M, 2010), the results show that the differences are small. In particular, these differences are not observed in the case of the Albanian donkey subpopulation grown in mountainous regions.

The results of discriminate analyses show that the studied donkeys could be classified into two distinct groups- the lowland donkey and hilly-mountainous donkey. Based on the average values of the body development indices lowland donkeys, they could be classified into a "standard type" group; meanwhile the hilly-mountainous donkeys are of the "miniature Mediterranean" type.

## CONCLUSION

Currently the donkey is one of most preferred animals for farm work in Albania. Donkeys are mainly used for transport, different farm work and as a pack animal.

The donkey population size has diminished over the years.

In the Albanian population of the common donkey, two different types are distinguished: the lowland donkey that could be classified in "standard type" group and the hilly-mountainous donkey of the "miniature Mediterranean" type.



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*Lumturi PAPA i Kristaq KUME***REZULTATI IDENTIFIKACIJE I KARAKTERIZACIJA  
POPULACIJE MAGARACA U ALBANIJI****SAŽETAK**

Magarci su živjeli vjekovima u Albaniji, posebno u priobalnim područjima i brdovitim krajevima, pomažući čovjeku u njegovim pokušajima da se suočavaju sa grubim okruženjem. Skromni zahtjevi što se tiče hrane, radne sposobnosti i korišćenje u transportu su najvažnije osobine ove životinje. To je razlog zašto je čovjek na kršu davao prednost magarcima u odnosu na druge životinje kao što su konji i mazge. Intenziviranje poljoprivrede i depopulacija udaljenih seoskih područja su uticali na smanjenje ekonomskog značaja magarca. Veličina populacije je takođe opala. Ipak, magarac nastavlja da bude životinja koja se često srijeće u ruralnim oblastima Albanije. Veličina populacije magaraca procjenjuje se na oko 35.000 do 40.000 životinja. Do danas populacija magaraca u Albaniji nije bila predmet naučnog istraživanja. Albanski lokalni magarac je rasa porijeklom iz Nubia. Cilj ove studije bio je identifikacija i fenotipske karakterizacije albanske populacije magarca. Na osnovu izvršenih istraživanja u različitim regionima, albanski magarac je opisan kao mala životinja, sive, crne, crvenkaste do ljubičasta dlake. Pozivajući se na prosečne morfološko-biometrijske osobina identifikovane su dva tipa. Tipovi se statistički značajno razlikuju ( $p < 0,05$ ): po visini (98cm, 115cm), obimu grudi (116.2cm, 131.6cm), dužini tijela (104.2cm, 120.6cm), dubini grudi (43.1cm, 48.2cm), širini grudi (24,2 cm, 28.3cm), obimu tibie (12.5cm, 14.7cm), dužini ušiju (21,1 cm, 27.7cm), tjelesnoj težini (97,3 kg 154.7kg). Razlike između mužjaka i ženki nisu značajne ( $P > 0,05$ ). Za dalje utvrđivanje razlika između dva tipa albanskih magaraca neophodno je izvršiti analizu polimorfnih proteina krvi i DNK.

**Ključne riječi:** magarac, lokalna rasa, fenotipska karakterizacija.