The Domestic Livestock Resources of Turkey: Status, Use and Some Physical Characteristics of Mules

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Mules are known to have been used as carriage and riding animals in Mesopotamia and Anatolia as early as the beginning of the second millennium BC but may have been first bred in Anatolia in the Third Century BC. They have thus contributed to Turkey’s cultural, social and economic heritage for more than 4,000 years and were an ancient component of its guild of domestic animals and overall biodiversity. Once bred country-wide most mules are now introduced “illegally” to the southeast and east from Iraq and Iran. Mules are now bred only in one small area in north-central Turkey close to the Black Sea. The major role as a pack animal has been usurped since the mid-twentieth century by increasing use of motor transport and numbers have declined rapidly since the early 1980s. In 2009 about 51,500 mules remained in Turkey, mainly distributed in discrete areas in the extreme southeast, the centre-south, the northwest and the cen ter-north. In the southeast the main role is in cross-border trade (much of it described as smuggling) whereas in other areas mules are used in support of pastoral and farming operations. Mules in Turkey are of various colours but are generally large and strong compared to those found in many other countries. Pressure on numbers will continue and will exert a negative effect on a part of Turkey’s national heritage and domestic animal biodiversity.

Key words: farm animal biodiversity, Equus asinus x Equus caballus, mammalian hybrid, work animals

“The mule seems to have been used by the ancients in a great variety of ways; but what should have prompted his production must for ever remain a mystery. That they early discovered his great usefulness in making long journeys, climbing mountains, and crossing deserts of burning sand, when subsistence and water were scarce, and horses would have perished, is well established. That he would soon recover from the severe effects of these long and trying journeys must also have been of great value in their eyes. But however much they valued him for his usefulness, they seem not to have had the slightest veneration for him, as they had for some other animals.” [11].

The mule is the classic interspecific mammalian hybrid arising from the (usually) human assisted crossing of a donkey male on a horse female. The archaeological evidence is not very clear but ancient texts attest to the fact that mules were present in Anatolia during the first part of the Second millennium BC (4,000 years Before Present) as both carriage and riding animals for important people [10] although this does not necessarily mean they were bred there. One source asserts that mules were first bred from donkeys and horses in Mesopotamia and Anatolia in the Third Century BC (2,300 years BP) as horses from the north and donkeys from the south met in this area [9] and about 3,000 years after donkeys were first domesticated [12]. There is also speculation, however, that the Hittites used mules earlier than the Third Century as riding animals for war leaders and standard bearers (Quoted by [5], p 63). This was because the hybrid vigour of the ass-horse cross resulted in animals that at 14 hands high (142 cm) were possibly more than one hand (10 cm) taller than the local horse and therefore generals and standard bearers could be more easily seen by the troops. The mule was also used later by Turkish armies both by commanders and the kettle drummers who transmitted orders from the leaders to the troops. Light or parti-coloured mules would have been even more conspicuous in key battle positions [5]. In modern Turkey the mule continues to be of cultural importance in its representa-
tions in folk tales and dances over much of the country [2]. Mules are thus an important aspect of Turkey’s cultural, social and economic heritage and remained an important contributor to national biodiversity and sustainable production in rural areas throughout history. In addition to native bred mules there has probably always been considerable cross border movement of animals. This may have been the case especially in the east and southeast of the country where the Kurdish people also live on Iraqi and Iranian territory that neighbours Turkey.

**Status**

In the early 1960s there were some 170,000 mules in Turkey (Fig. 1). This number almost doubled over the succeeding years to reach 324,000 in 1977. Numbers were maintained at about this level for a further five years since when there has been a consistent reduction in the mule population. In 2009 the numbers of mules in the country were at their lowest recorded, the actual number being about 51,500 [13]. The reason for mules maintaining their numbers for a longer period than donkeys – whose numbers started to decline rapidly from the early 1970s [15] – were able to do is not known. Mules are the least numerous equine in Turkey representing 11.1% of the total complement of this group compared to the 38.6% of horses and the 50.3% of donkeys.

In 2012 mules are found principally in four more or less mountainous and discrete areas of Turkey (Fig. 2). These are; (1) southeast and east Turkey below the Southeast Taurus Mountains in the Sırnak, Mardin, Hakkari and Van in Provinces close to the national border with Syria, Iraq and Iran where they are owned almost exclusively by Kurds; (2) southern Turkey in the hilly and mountainous areas of the Middle Taurus Mountains in Mersin (formerly Içel) Province where they are owned almost exclusively by the pastoral and seminomadic Yoruk people; (3) western Turkey south of the Sea of Marmara and east of the Mediterranean Sea and around Mount Temnus in Balıkesir Province where once again the main owners are the Yoruks; and (4) north-central Turkey south of the Black Sea and in the northern foothills of the Canik Mountains in Ordu Province.

Most “Turkish” mules are not bred in the country but imported from neighbouring Iraq and Iran (interviews with owners and key informants by Orhan Yılmaz). These imports are technically illegal in that there is very little to no formal transfer of place nor owner when the animals enter Turkey. In the southeast in Sırnak, Mardin and Van Provinces all animals are from Iraq. Hakkari Province has borders with both Iraq and Iran but it is only Iraq that provides mules to Turkey here. In these provinces mules are raised only in places which are close to the national border.

All the mules in the Mersin area are imported from Iraq to Turkey and first transit through the east/southeast concentration area before being brought to Mersin. Rather more surprising is the apparent fact that mules in Balıkesir also originate from far-away Iraq and are then transported to the far northwest of Turkey.

Ordu Province appears to be unique in Turkey in that it is the only concentration area of mules in which in the twenty-first century they are actually bred. Local donkey jacks are here used on Canik horse mares to produce mules. The home tract of the Canik is north-central Anatolia close to the Black Sea mainly in the Canik Mountains after which the horse type is named. It is a very sure footed horse well adapted to the hilly and mountainous areas that are its home [17] and thus probably an ideal progenitor for mules.

**Use**

Mules were used by both the Ottoman and the Western armies in the First World War (1914–1918). Little is known of their actual use by the Ottomans but there is considerable information on their employment by the Western allies. Elements of the Indian Army and the Australian and New Zealand Army Corps (ANZAC) made great use of mules at the battles around Gallipoli in the summer and autumn of 1915. There was also a Zion Mule Corps which had been raised in Egypt expressly for the Dardanelles Expedition from Jewish refugees from Syria and was thought to be the first entirely Jewish unit to enter battle for almost two thousand years. The Indian Mule Corps – manned largely by Sikhs who refused to take leave because they thought their replacements would not take good care of their mules – comprised eight troops of 96 mules each that carried ammunition, medical supplies and signalling equipment [1]. It was said that horse or motor transport would not have been able to face the difficulties of Anzac [3]. There were 1889 mules at Anzac Cove in 1915 of which at least 296 were killed and 599 wounded [1].

It is noteworthy that mules in modern Turkey are mainly found in what might be considered classic country for this hardy and sure-footed species. In these mountainous areas roads are few and far between or non-existent, so motor vehicles are largely precluded and horses have insufficient strength, stamina and agility to work here. This preponderance of mules in more difficult terrain is to be expected from their locations in other countries such as upland Nepal [8], in high altitude natural-resource-poor areas of central Mexico [14] and in
Lesotho where mules are used at altitudes and in forestry conditions not suitable for wheeled transport [6]. Another particularity of mules in Turkey is their association with minority groups such as Kurds and Yoruk (Fig. 3). These groups are also poor in natural and financial resources.

In the Kurdish areas of east and southeast Turkey mules are largely used in cross-border trade, much of which is illegal. The main commodities transported are oil products originating in Iran and cigarettes from Iraq. Animals are often turned loose outside Turkey and left without

Fig. 1. Mule numbers in Turkey, 1961-2009 (Source: [7]).

Fig. 2. Major distribution areas of mules in Turkey, 2012.

Fig. 3. Kurd woman with pack mule.

Fig. 4. Turkish mule showing back stripe and shoulder cross of male parent.
attendants to return alone to their own homes. Although the national borders are patrolled by the army there seems to be some tacit acceptance of smuggling. The reasons for this could be related to the European Union accession process and also to a belief on the part of the authorities that further oppression of the Kurds will lead to greater separatist activity and terrorism.

The rocky areas of the Southeast Taurus Mountains in which Mersin Province is located are largely unsuitable for agriculture but are well wooded. The local Yoruk people have maintained their seminomadic and pastoral existence and use their mules here for transporting wood and other forest products to supplement their incomes and contribute to improved livelihoods.

Although Balikesir in the northwest has some hilly and mountain areas the environment here is less demanding than in Mersin and the Mediterranean influence allows cultivation of olives. In addition to transport of wood and forest products the Yoruk people also hire out their mules to local cultivators for carrying olives and olive oil.

The Canik Mountains of Ordu Province are blessed with better soils than many other parts of Turkey. Hazel (cob) nuts are a major agricultural output from this area and their transport is one of the major activities of mules. Others are used by cattle and sheep breeders who transverse to the mountains to carry camp gear and other small necessities.

Many mules in Turkey are used to advanced ages. In one study in the southeast of the country 24% of mules were aged more than 10 years and some were still being used at upwards of 30 years [18]. Use to advanced ages is common in other countries: in Morocco, for example, 54% of mules slaughtered for meat were 10–15 years of age and 19% were older than 15 years [4].

Physical Characteristics

In a study of 236 mules in four provinces of east and southeast Turkey the ANOVA and Students t-test functions of the Minitab programme were used to analyze data. Average withers height was 130.6 ± 0.49 cm (12 hands 3) [17]. These results were very similar to those found in an earlier study of the morphometry of Turkish mules where withers height was determined as 130.4 cm. Withers height was not affected by sex (although males appeared slightly larger), age or coat colour but was by province of location (Table 1). The provincial differences possibly reflect difference of origin in the mules found there. All measured traits were affected by the province variable but there were no other significant differences in traits due to sex, age or coat colour. The lack of difference in mensuration due to age is indicative of early maturity of mules for body size. Turkish mules appear to be larger than English ones which average about 120 cm at the withers (Faith Burden, personal communication, 12 July 2011).

Coat colour is very variable with bay (42.8% ) being predominant. Other common colours are white (23.7%) and black (16.5%) with chestnut (7.6%) and grey (7.6%) being less common and dun (buckskin) (0.8%) and cream (isabelline) (0.8%) being seen occasionally. The back stripe and shoulder cross of the parent donkey is maintained in some mules (Fig. 4).

Conclusion

Mules have been present in Turkey for about four thousand years. They have been used in war and in agricultural and transport operations as both riding and pack animals. They have lost much of their former value, having been replaced by mechanical and electrical power in many areas. They still retain some importance in hilly and mountainous areas and especially for resource poor minority groups. Downward pressure on numbers (the mule population of 51,500 animals in 2009 was less than one-sixth of the 324,000 head present in the country in 1977) will continue and this, combined with the restricted and fragmented geographical distribution of the species within the country, will exert a negative effect on a part of Turkey’s national heritage and domestic animal biodiversity. As part of the country’s historical and cultural heritage, however, their breeding should be encouraged and supported.

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Table 1. Descriptive statistics of some phenotypic traits of Turkish mules

| Variable | Trait (all measurements are in centimetres and provided as mean ± s.d.) | Withers height | Rump height | Body length | Heart girth | Chest depth | Cannon circumference | Head length |
|----------|---------------------------------------------------------|----------------|-------------|-------------|-------------|-------------|---------------------|-------------|
| Overall (n=236) | 130.6 ± 0.49 | 130.7 ± 0.50 | 133.9 ± 0.49 | 149.6 ± 0.46 | 59.7 ± 0.34 | 16.5 ± 0.07 | 55.6 ± 0.26 |
| Sex | | | | | | | | |
| Male (n=121) | 131.2 ± 0.72 | 131.0 ± 0.74 | 133.8 ± 0.65 | 149.3 ± 0.67 | 60.1 ± 0.51 | 16.7 ± 0.11 | 56.3 ± 0.38 |
| Female (n=115) | 129.9 ± 0.64 | 130.3 ± 0.68 | 134.0 ± 0.74 | 149.8 ± 0.63 | 59.2 ± 0.45 | 16.3 ± 0.09 | 54.9 ± 0.34 |
| Province | | | | | | | | |
| Balikesir (19) | 131.4 ± 0.77 | 132.1 ± 0.75 | 133.8 ± 0.69 | 149.2 ± 0.66 | 60.1 ± 0.51 | 16.7 ± 0.09 | 56.3 ± 0.38 |
| Hakkari (29) | 131.2 ± 0.71 | 131.9 ± 0.74 | 133.6 ± 0.67 | 149.0 ± 0.68 | 60.0 ± 0.51 | 16.7 ± 0.09 | 56.3 ± 0.38 |
| Mardin (21) | 131.5 ± 0.73 | 132.1 ± 0.75 | 133.8 ± 0.68 | 149.1 ± 0.69 | 60.1 ± 0.51 | 16.7 ± 0.09 | 56.3 ± 0.38 |
| Icel (14) | 132.0 ± 0.76 | 132.5 ± 0.78 | 134.0 ± 0.69 | 149.3 ± 0.70 | 60.2 ± 0.52 | 16.7 ± 0.10 | 56.4 ± 0.39 |
| Ordup (54) | 132.5 ± 0.78 | 132.4 ± 0.77 | 134.1 ± 0.70 | 149.2 ± 0.71 | 60.2 ± 0.52 | 16.7 ± 0.10 | 56.4 ± 0.39 |
| Sirnak (37) | 133.4 ± 0.79 | 134.5 ± 0.81 | 134.6 ± 0.72 | 149.3 ± 0.72 | 60.3 ± 0.53 | 16.7 ± 0.10 | 56.4 ± 0.39 |
| Van (62) | 139.9 ± 0.87 | 129.9 ± 0.89 | 134.2 ± 0.82 | 148.5 ± 0.85 | 59.8 ± 0.53 | 16.3 ± 0.11 | 54.9 ± 0.53 |
| Age | | | | | | | | |
| 3–5 years (n=60) | 130.1 ± 0.94 | 130.0 ± 1.00 | 134.7 ± 1.01 | 150.3 ± 0.75 | 59.0 ± 0.56 | 16.5 ± 0.13 | 55.9 ± 0.47 |
| 6–7 years (n=52) | 130.2 ± 0.94 | 129.9 ± 0.92 | 133.7 ± 0.90 | 150.2 ± 0.83 | 59.4 ± 0.73 | 16.5 ± 0.15 | 55.8 ± 0.62 |
| 8–9 years (n=67) | 130.8 ± 0.96 | 130.9 ± 0.99 | 133.6 ± 0.96 | 148.8 ± 1.11 | 59.7 ± 0.63 | 16.5 ± 0.15 | 55.1 ± 0.49 |
| 10–30 years (n=57) | 131.1 ± 1.04 | 131.7 ± 1.09 | 134.2 ± 1.04 | 149.1 ± 0.87 | 60.6 ± 0.83 | 16.7 ± 0.14 | 55.7 ± 0.49 |
| Coat colour | | | | | | | | |
| Chestnut (n=18) | 130.6 ± 1.41 | 131.2 ± 1.29 | 135.2 ± 1.57 | 150.1 ± 1.18 | 59.3 ± 1.09 | 16.3 ± 0.18 | 56.5 ± 0.81 |
| Bay (n=101) | 131.4 ± 0.82 | 131.5 ± 0.85 | 134.5 ± 0.77 | 150.0 ± 0.78 | 60.4 ± 0.58 | 16.6 ± 0.12 | 55.7 ± 0.42 |
| Grey (n=18) | 131.9 ± 1.34 | 132.1 ± 1.15 | 136.3 ± 1.51 | 148.9 ± 1.45 | 60.3 ± 1.14 | 16.3 ± 0.28 | 54.0 ± 1.00 |
| Cream (n=2) | 126.5 ± 4.50 | 126.5 ± 6.50 | 123.5 ± 6.50 | 137.5 ± 8.50 | 56.0 ± 6.60 | 15.0 ± 0.50 | 52.5 ± 2.50 |
| White (n=56) | 130.3 ± 0.97 | 130.4 ± 0.98 | 133.0 ± 0.93 | 148.2 ± 0.91 | 59.5 ± 0.65 | 16.4 ± 0.13 | 55.1 ± 0.52 |
| Black (n=39) | 128.9 ± 1.07 | 128.7 ± 1.21 | 133.2 ± 1.28 | 151.2 ± 0.94 | 58.3 ± 0.73 | 16.9 ± 0.17 | 56.4 ± 0.53 |

a, b, c Means with different postscripts in the same column and in the same variable group differ significantly (P<0.05). Source: [17]
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