

Canadian Journal of Applied Sciences. Volume 2: p-158-172; October, 2012
ISSN 1925-7430; Available online <http://www.canajas.ca>

Original Research Article

THE DOMESTICATED DONKEY: I – SPECIES CHARACTERISTICS

Orhan Yılmaz^{1*}, Saim Boztepe³, Mehmet Ertuğrul²

1. Iğdır University, Faculty of Agriculture, Department of Animal Science, Iğdır, Türkiye
2. Selçuk University, Faculty of Agriculture, Department of Animal Science, Konya, Türkiye
3. Ankara University, Faculty of Agriculture, Department of Animal Science, Ankara, Türkiye

ABSTRACT

The objective of this study is to define domestic donkey giving some information about species characters including taxonomy, origin, terms, ecology, form, lifespan, behaviour, vocal expression, colour, markings, and relationships with other species, religion and myth. The donkey is an odd-toed ungulate. Donkeys may be the only hoofed animal domesticated first in Africa, and apparently the first to be domesticated for transport. In the Middle East, in past centuries, there were special breeds of donkey reserved for royalty and the nobility. Compared to a horse, a donkey seems slender and delicate.

Keywords: Origin, terms, ecology, form, behaviour, colour.

Corresponding Author: Orhan Yılmaz Tel: +90-4762261314-Ext: 2015, Fax: +90-4762261251, Email: zileliorhan@gmail.com

INTRODUCTION

Donkey or ass is a domestic animal falling under equine family. In this family there are the horse, mule and zebra. Donkeys are used by human for draught, pack, and ridden work, milking, breeding, and sometimes eating. Donkeys have some advantages and disadvantages. They are generally voluntary to work and friendly towards human. Donkeys can be trained easily and need little supervision during work. They are easy to be fed and consume poor food well. They are comparatively cheaper to buy than other draught animals. On the other hand they generally suffer from being alone and can be noisy when frustrated and alone. They are breed and mature slowly.⁷

The aim of this compilation was to provide information of species characters including taxonomy, origin, terms, ecology, form, lifespan, behaviour, vocal expression, colour, markings, and relationships with other species, religion and myth of donkey.

Origin

The name of *Equus asinus* was determined by Linnaeus in 1758. The type locale was in Manisa, Turkey.⁷ The donkey may have been domesticated in the Sahara Desert region 6,000 years ago, perhaps earlier in Egypt,¹⁵ and afterwards spread to most countries of the world. In historical times, donkeys became the chief means of transport over the Asian Silk Road between China and Europe for many centuries.^{3, 13} Groves⁸ has suggested that original donkey domestication might have been in the Middle East, not long after the beginning of

agriculture. Despite the importance of the domesticated donkey, faunal remains and rock art representations of donkeys are extremely rare. This can possibly be explained by the fact that donkeys have mostly been important for poor households and have consequently had low prestige.⁵



Figure 1. 2 weeks (left) and 6 months (right) Lupenyo
(www.donkeypower.donkecology.com)



Figure 2. Browsing Manda
(www.donkeypower.donkecology.com)

Figure 7. Grazing Mulonga
(www.donkeypower.donkecology.com)

Terms

In English, the proper word for a donkey is 'ass'. The word 'donkey' is an etymologically obscure word. The first written attestation of it dates to ~1785, and it seems to have been

introduced in the 19th century, possibly derived from the Flemish ‘dunnetjie’, meaning small and dun-coloured. In Flemish and Dutch the word for ass is also ‘esel’, which, like the French word ‘âne’, clearly derives from the Latin ‘asinus’, signifying that the donkey was introduced to most of Europe by the Romans.¹⁷

Taxonomy

Table 1. Scientific classification of the donkey.

Kingdom	Animale	Family	Equidae
Phylum	Chordata	Genus	Equus
Class	Mammalia	Subgenus	Asinus
Order	Perissodactyla	Species	E. asinus

(Yarkin, 1962)

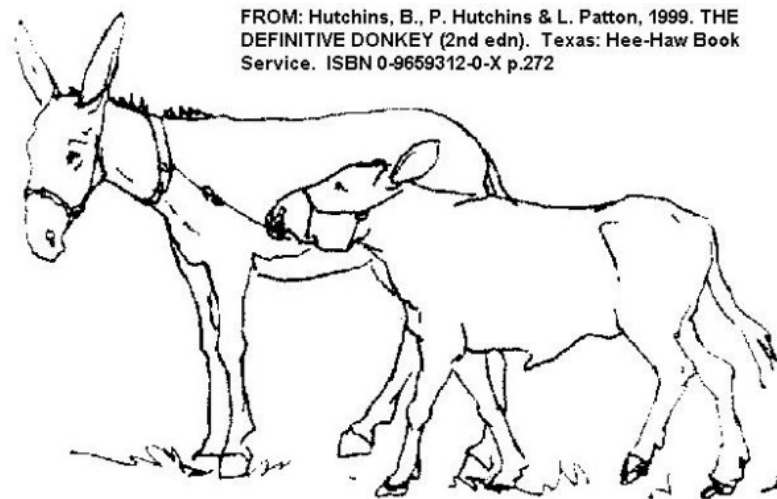


Figure 3. Calf training (www.donkeypower.donkecology.com)

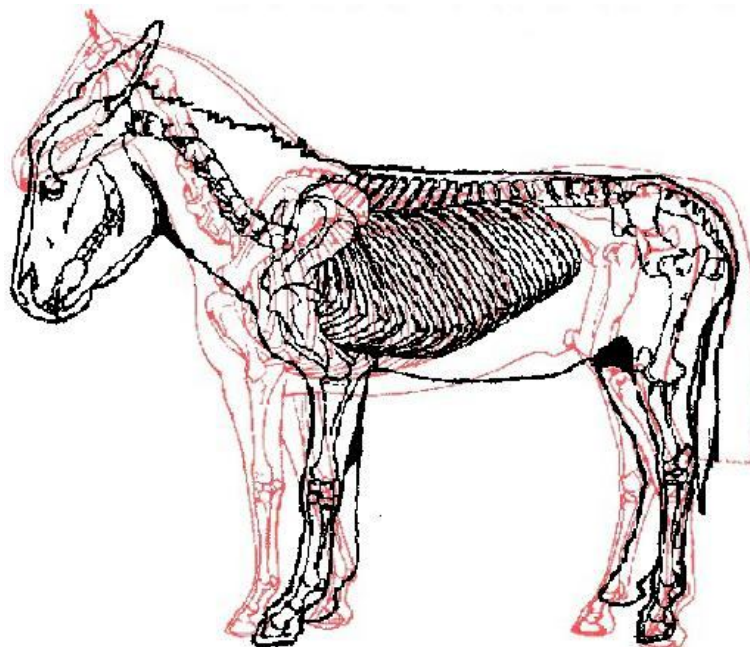


Figure 4. Horse& donkey skeletons superposed (www.donkeypower.donkecology.com)

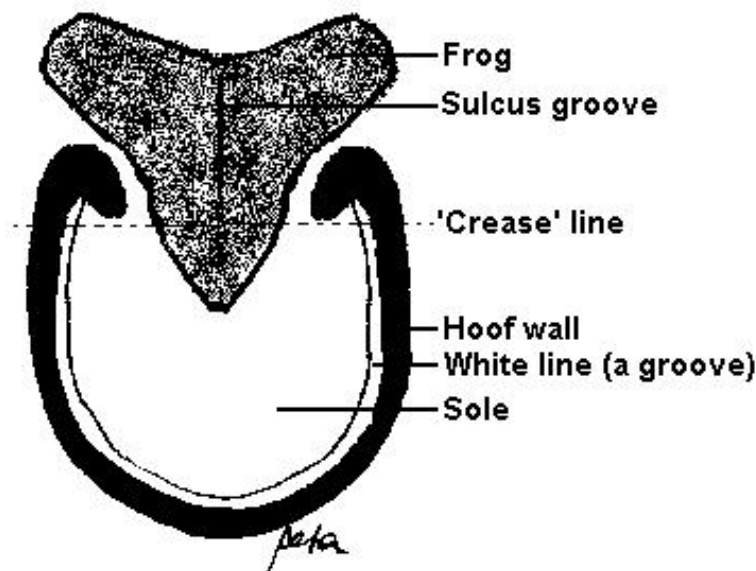


Figure 5. Hoof underside (www.donkeypower.donkecology.com)

PLACEMENT OF FORCES ON DONKEY SKELETON

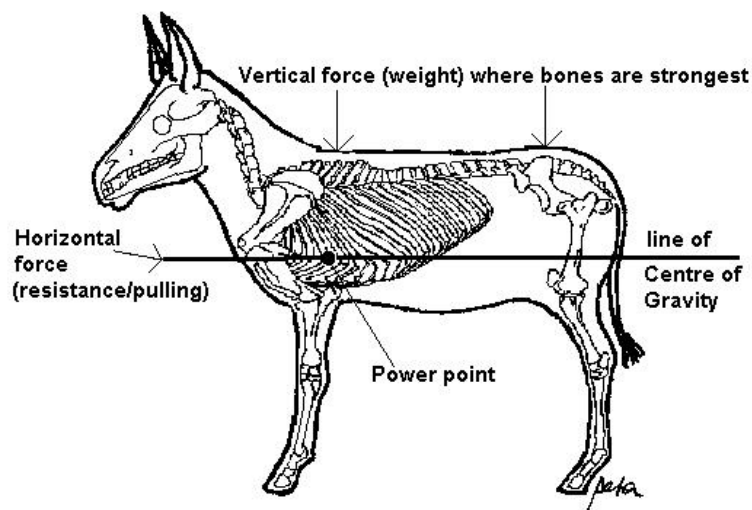


Figure 6. Donkey skeleton (www.donkeypower.donkecology.com)

The word 'ass' was made problematic by American usage, in which the British word 'arse,' spelled and pronounced that way but an offensive term for the part of the human body that is sat on, became pronounced and even spelled 'ass' in American English. This has done the animal no service, so the word 'donkey' is now preferred to 'ass'. Positive associations as embodied in the English phrases 'donkey's years' and 'donkey work' – reflecting the longevity of the animal and its capacity for hard work – presumably originated in the 19th century.¹⁷

Ass: The classic English word for *Equus asinus*. Used in the King James version of the Christian Bible, where donkeys often play an important role, mainly in the Old Testament.

Donkey: Slang and now preferred alternative word for 'ass'.

Jack Stock (Jackstock): A group term for the American Mammoth Jack and Jennet, because the male version was used in breeding mules.

Jack or jackass: A male donkey. The term stallion may also be used instead of jack or jackass, especially where an uncastrated male is indicated.

Jennet or jenny: A female donkey. The word 'mare' is often also used instead of jennet or jenny, especially where breeding is referred to.

Colt: Male offspring $\leq$ 1 year old of a donkey (or horse).

Filly: Female offspring $\leq$ 1 year old of a donkey (or horse).

Burro: In Latin America or the Spanish-influenced Western United States, also in Lusophone Africa, word for donkey.

Cuddy: Colloquial Scottish name for donkey.

Moke: Welsh gypsy name for donkey or mule.

Mule: Offspring of jackass (male donkey) and mare (female horse)

Hinny: Offspring of jennet/jenny (female donkey) and stallion (male horse).

Gelding: The proper term for a gelded (castrated or altered) male donkey (or horse).

Mule Jack: Not necessarily a mule, but a jackass used to breed to horse mares to obtain mules.

Jennet Jack: A jackass used to breed to jennets (female donkeys) to produce more donkeys (www.lovelongears.com, 2011).¹⁸

Ecology

Donkeys tolerate hot, dry conditions, often in areas with low-quality forage. They have a higher threshold for thirst than other equine species in terms of water intake and latency to drink when fluid deficits develop.⁷ They do not thrive in damp areas, but easily live in marginal desert lands and are adapted to areas that are arid at least seasonally.²

Form

Equus asinus individuals typically have narrow, concave and slightly flexible hoofs which are suitable for rocky areas rather than flat desert or sand dunes. 'Chestnuts' (vestigial remains of a 'thumb' or dewclaw) are located only on the forelimbs. The dental array is: incissium 3/3, canine 1/1, premolar 3-4/3, molar 3/3, giving a total of 40 or 42 teeth. The incisors are used to seize plants and break off portions, or sometimes to uproot the whole plant while foraging, in which hoofs may also be employed. Donkeys breathe ~22 times per minute.⁷ Their ears are proportionally much bigger than those of most other animals and enable them to hear the distant calls of fellow donkeys. The long ears also help to cool the donkey's blood. Donkeys' tough digestive system can break down near-inedible vegetation and extract moisture from food more efficiently.

Lifespan

The normal lifespan of a donkey in good health can exceed 50 years, but their lives are often shortened by poor management and parasite infestation.¹² In Ethiopia a donkey life span is ~9 years, but they can live up to 25 years under adequate health care and improved nutrition.¹⁰ Their average lifespan is about 15 years in Mexico. In some countries Jennies are not kept by donkey owners, who believe that, "Jennies cause problems and do not work well". Thus in such areas the ratio of males to females is about 4:1 which causes lowered donkey production. Abandoned Jennies are mostly killed by predators.²⁰ Where jacks are left uncastrated, this can also cause problems, as intact jacks can be aggressive towards younger males and even kill them.¹¹

Behaviour

In the wild, donkeys graze from dawn till late morning and again in the late afternoon; they rest in the heat of the day and around midnight, when they will actually lie down to sleep, leaving one or more of their number standing on guard. Much of their behaviour is governed by their herd-animal nature. Some wild male donkeys are territorial, inhabiting and defending specific areas for several weeks.⁷



Figure 8. Manda at 22 years
(www.donkeypower.donkecology.com)



Figure 9. Milking
(www.donkeypower.donkecology.com)



Figure 10. Mudenda showing stripes
(www.donkeypower.donkecology.com)



Figure 11. Mule logging
(www.donkeypower.donkecology.com)

When not sexually excited – sometimes a problem in intact males of any species – or being aggressive towards carnivores, donkeys are very friendly, calm, quite, patient, intelligent, cautious, playful, and eager to learn and enjoy the company of humans. They have great endurance. They are very cautious and agile on poor tracks. They are notorious for stubbornness, but this is due to some handlers' misinterpretation of their highly-developed sense of self preservation. It is difficult to force or frighten a donkey into doing something it sees as contrary to its own best interest. Donkey is self-preserving in nature, but it is often wrongly called 'stubborn' by humans. This almost certainly reflects the handlers' shortcomings rather than the donkeys'. They prefer to do what is good for themselves, which is not always what the human thinks is best, especially when it comes to getting their feet wet. They dislike stepping in water or on wet areas, and even dislike bridges over dry gullies. Donkeys can perform all the gaits that horses or mules do,^{18, 19} but prefer a four-footed gait.

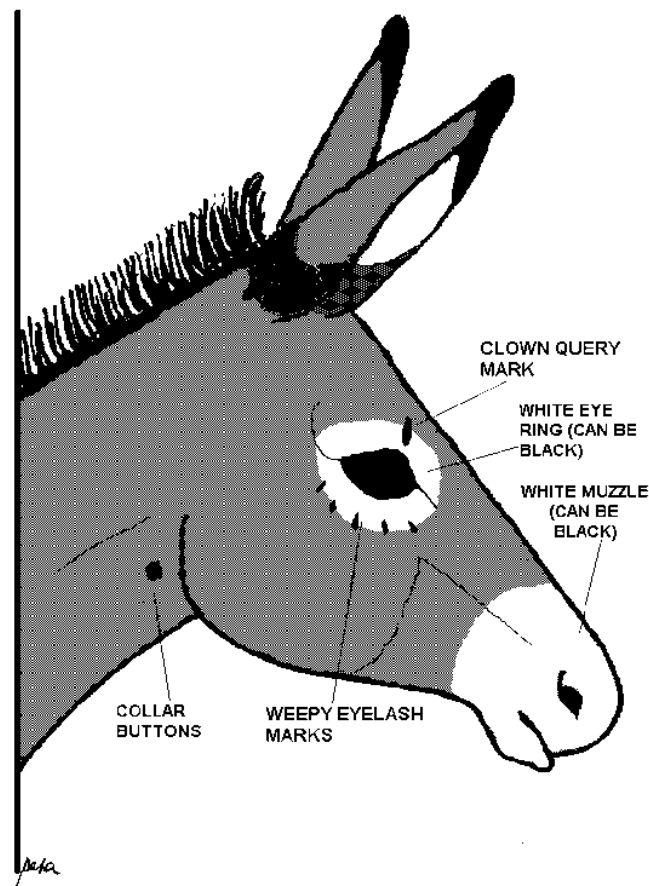


Figure 12. Some possible markings around a donkey's head
www.donkeypower.donkecology.com

Donkeys can defend themselves with a powerful kick of their hind legs, but they can also chop down with their front legs from a rearing position, or even with one foreleg on the ground, and have been known to kill dogs in this way. A donkey's eyes are placed such that it can see all four feet at any one time,¹⁹ and they are notable careful about where they put their feet, even when they are moving fast.

Territorial males are dominant over individuals of their own species. Adults of both sexes are dominant over juveniles. No regular leadership is observed in large groups.⁷ Territorial stallions chase or escort intruding males away from the mares. A territorial donkey stallion shows dominance by posture: holding their head upright, forward facing ears, ritual chasing of other stallions and examination of other individuals' scents. As seen in all *equids* and mammals generally, donkey foals engage in many play behaviours. They frolic, run, chase, buck, jump and leap. They toy with interesting objects in their environment. They pick up, carry, sniff, chew, shake, pull or paw items. Foals mount other young and also adults. They engage in 'King of the Mountain' competitions, block passageways to exclude others, and engage in play fighting. At the age of one year, a donkey foal still spends most of its time no more than 10 m away from mother,² and may not be weaned until the next foal is born to its mother, sometimes not even then.

Donkeys are herd animals and, while preferring their own species, can adapt to live in groups of a different species such as horses, sheep and goats.^{1, 11}



Figure 13. Mystery location (www.donkeypover.donkecology.com)

Vocal expression

Donkeys tend to express themselves vocally only when they know they can be heard, and that attention will be paid to their needs.

- **Braying:** Donkeys have developed very loud voices, really raspy and brassy. The bray is the characteristic ‘hee-haw’ as “aw-ee, aw-ee” and can be heard for over 3 kilometres. This enables donkeys to keep in touch with other members of their herd over the wide spaces of the desert,¹⁹ and is often an expression of frustration or loneliness.¹⁴ Jacks especially seem to enjoy braying and will ‘sound off’ at any opportunity (www.lovelongears.com, 2011).¹⁸
- Donkeys are adapted to living in arid or semi-arid areas and so need to separate somewhat for grazing and browsing; therefore braying is significantly important in their life in case of danger.⁷ The bray is produced during both the air intake for the “ee” and air outflow for the “aw”. Typically, braying consists of a series of brays, primarily by males. They are mechanically produced with some variation and terminated when the animal becomes short of breath. The acoustic character, duration and sequence, some “ee-aw, while others “aw-ee”, are unique to each animal.⁶
- **Other sounds:** Donkeys have a considerable vocal range. Even within the bray, experienced listeners can detect differences in emphasis and intent. A donkey facing danger can make a sound very like the roar of a lion, and in more intimate situations, as when a donkey is expecting food or meeting a friend after an absence, there are various grunts and whines that can convey its feelings.

Colour

Colours in the donkey range from the gray shades of gray-dun to brown, black, light-faced roan (both red and gray), variants of sorrel, the blue-eyed ivory, frosted/spotted white, bay and spotted pattern. Real horse Pinto, Horse aging gray, horse Appaloosa, Palomino and buckskin colours do not occur in the donkey (www.lovelongears.com, 2011).¹⁸

Although most donkeys are of the familiar gray-dun colour, they can have lots of colour shades. Most donkeys have dorsal stripes and shoulder crosses, leg barring (garters), dark ear marks as well as light points, white muzzle and eye rings, white belly and inner legs.¹⁸ Unless white all over, they do not have any white colour on their rump.⁷



Figure 14. Preventing while mother milked (Photo by David Smith)



Figure 15. Skeleton at Onderstepoort (www.donkeypower.donkecology.com)



Figure 16. Donkey in a herd (Photo by Wolfgang Bayer)

Markings

- Cross: This refers to a line of darker hair starting with the mane and running to the end of the tail, called 'dorsal stripe' or 'eelstripe'. This is usually crossed at the withers by another darker line of hair, or 'shoulder stripe', forming a cross. The shoulder stripe may be long, very short, thin, wide, fading or dashed. Shorter crosses, or intersections along the dorsal stripe, can also occur starting back of the shoulder stripe and diminishing towards the tail. Crosses are not seen on all donkeys, but can even be discernible sometimes on black donkeys.

- There are commonly light areas or ‘points’ around the eyes (eye rings), muzzle and belly and on the insides of the legs. When these areas are light, so, also, is the inside of the ears.
- Many donkeys also have dark markings on the ears, and as ‘garters’(or zebra marks) around the legs or as ‘zippers’ down the inside of the forelegs.
- Smaller dark markings can often be found on the side of the neck (collar buttons), and above and below the eyes – see Fig. 12.



Figure 17. Thriving on dry grass(www.donkeypower.donkecology.com)

Relationships with other species

Donkeys and horses

Both belong to the *Equidae* family, but there are some morphological differences, which can make a difference to the equipment which each can use. For instance, points nine, 10 and 11 below mean that donkeys cannot be efficiently or comfortably saddled and hitched in the same way as horses.

1. The donkey only has chestnuts (epidermal callosities) on the inner surfaces only of its forelegs, whereas the horse has them on all four legs.
2. The donkey has a long head with a big nasal cavity compared to the horse's short and wide head.
3. The ears of donkeys are longer than 20 cm, and hairy, but the ears of horses are shorter than 15 cm in adults in length and less hairy.
4. Donkey hoofs are higher, smaller, narrower, longer and more flexible than horse hoofs, whereas horse hooves are lower, bigger, rounder and broader and more of a unit.
5. Pasterns are more upright in a donkey than in a horse, i.e. the angle between the donkey's hoof and the ground is steeper.
6. A forehead blaze is rare and nose blaze and white socks virtually unknown on donkeys, whereas horses often have these.
7. The donkey tail is terminally tufted, a 'broom tail', with long hair confined to the distal half, but the horse's whole tail is long-haired, long hairs growing from its base.
8. A donkey neck is straighter than a horse's neck.
9. The donkey has virtually no withers, and it is not prominent as in horses – in other words, the donkey scapulae are on a level with its anterior spine.

10. A donkey's crupper and rump are also not as pronounced as those of horses, its pelvis having a slightly different angle compared to that of a horse.
11. A donkey generally has a straight back and a dipped loin, with the spine pitched slightly above the ribs, whereas a horse commonly has a slightly swayed back and is level across the spine and rib joins and over the pelvis.
12. The donkey mane is usually coarse, stiff and upright, but all horse manes are long-haired.
13. A forelock is generally absent on donkeys, but all horses have forelocks.
14. In an emergency situation donkeys behave purposefully and calmly, regrouping if they can and facing the danger, but horses can bolt for long distances.
15. The gestation period for a donkey can vary between 10 and 14 months, but the gestation of a horse is about 11 months or 336 days.^{7, 9, 14, 18}



Figure 18. Jenny and foal (Photo by Shaun Farmer)



Figure 19. Jenny and foal (Photo by Shaun Farmer)



Figure 20. Jenny and foal (Photo by Shaun Farmer)



Figure 21. A happy rider (Photo by Mashudu Maroge)

Donkeys and cattle

When a donkey is compared to an ox, there are some advantages and disadvantages to be considered (Table 2):

Table 2: Comparison of donkeys with cattle

ADVANTAGES of donkeys cf cattle	DISADVANTAGES of donkeys cf cattle
Process food more efficiently	With only one stomach, must eat frequently, particularly before working
Can work almost twice as hard	Young must drink mother's milk frequently
Will eat only about 1/5 th total food	No breed produces milk surplus to what is needed by young
Will eat only about 1/12 th high value food	Only work well with friends, so they need to be bought in pairs
Will drink only about 1/4 water	Can go far, and quickly, so they need supervision.
Kilogram for kilogram, donkeys thus produce more work for less food	
Manage heat better	
Can live up to 50 years and thus produce around 50.000 hours of work in a lifetime	
Range long distances to find food, so exhaust less of environment	
No slower than oxen, often faster	
Very easy to train	
Socially acceptable for women and children to use	
Suffer from fewer diseases	
Do not suffer from Foot and Mouth Disease	

**Figure 22.**Browsing on twigs (www.donkeypower.donkecology.com)

Religion and myth

The donkey may have been the manifestation of the Egyptian God of Seth, and is also the animal associated with the Greek god Dionysus. In the Christian Gospels, Jesus rides a donkey into Jerusalem.¹⁹ As this donkey is also a colt, a deeper symbolism is probably represented, but certainly the association between Hebrew kings and donkeys is intended. Outside of the scriptures, there are other myths associating donkeys with Jesus. In Hindu mythology a donkey (in Sanskrit) *gardbha* is the *vahana* (vehicle) of the god Kalaratr.¹⁷ In parts of India the ritual marriage of two donkeys is supposed to usher in good monsoon rains.¹⁶



Figure 23. Donkey defying dog
(www.donkeypower.donkecology.com)



Figure 25. Foal circa 6 months
(www.donkeypower.donkecology.com)



Figure 24. Easy to ride and with children (www.donkeypower.donkecology.com)

DISCUSSION

Donkeys are favourable for human life for centuries. Some studies showed that a couple of donkeys can produce a draught force of 15-20% of their combined body weight for three hours a day. In this way a couple of donkeys is enough to do all tillage work in light soil and can do secondary tillage and inter culture in other soil types. The speed of working donkeys is generally higher than oxen.⁴ Each year fossil fuels lessen and one day will be finished. Other energy sources are either too expensive or not developed enough yet to use. Power of donkey should not be ignored and humanity will need it in the future. Donkey is a potential of world's livestock heritage. They will be an important actor of the world's domestic livestock genetic resources and biodiversity. All of those reasons donkey will have a significant role in the future. All breeds should be conserved as a genetic material in donkey genetic pool.

ACKNOWLEDGEMENTS

This study was carried out under the supervision of Prof. Dr. Mehmet Ertugrul (Ankara University, Turkey) and I gratefully thank him. I would also like to thank Prof. Dr. Firat Cengiz (100. Yil University, Turkey), Prof. Dr. Ensar Baspinar (Ankara University, Turkey), Prof. Dr. Ibrahim Zafer Arik (Akdeniz University, Turkey), Prof. Dr. GurselDellal (Ankara University, Turkey), Prof. Dr. Saim Boztepe (Selcuk University, Turkey), Assoc. Prof. Dr. Askin Kor (100. Yil University, Turkey), and Assoc. Prof. Dr. Yalcin Bozkurt (Suleyman Demirel University, Turkey) for their comments. For constructive comments, careful scientific revision and editing in English, I am gratefully indebted to Dr Peta Jones (Donkey Power, South Africa).

REFERENCES

1. Aganga, A. A., Letso, M. and Aganga, A. O.(2000^a), 'Feeding donkeys. Livestock Research for Rural Development', Volume 12, No 2, pp (Online).
2. Anonymous,(2011), 'Taxonomy and nomenclature of donkey' (comprised of Beja-Pereira et al, 2004, Bulletin of Zoological Nomenclature 2003, Churcher 1982, Clutton-Brock 1999, Forstén 1988 and 1989, Froehlich 2002, Groves 1986, 1995 and 2002, Groves & Ryder 2000, Grubb 2005, Hooker 2008, Moehlman 2002, Rosselet al, 2008, Weinstock et al, 2005). <http://library.sandiegozoo.org/factsheets/donkey/donkey.htm> (accessed on 13.02.2011).
3. Beja-Pereira, A., England, P. R., Ferrand, N., Jordan, S., Bakhiet, A. O., Abdalla, M. A., Mashkour, M., Jordana, J., Taberlet, P., Luikart, G.(2004), 'African origins of the domestic donkey'. Science, No 304, pp 1781-1781.
4. Bekele, Z., Geza, M., Sisaye, A., Ibro, A. and Bullo, T.(2001), 'Draught characteristics of a pair of working donkeys in the Rift Valley of Ethiopia', Draught Animal News, No 35, pp 2-5.
5. Blench, R. M.(2004), 'This history and spread of donkeys in Africa', in D. Fielding & P. Starkey (eds), Donkeys, people and development. A resource book of the Animal Traction Network for Eastern and Southern Africa (ATNESA). Technical Centre for Agricultural and Rural Cooperation (CTA), Wageningen, The Netherlands. ISBN 92-9081-219-2.
6. Browning, D. G. and Scheifele, P. M.(2004) 'Vocalization of *Equus asinus*: The hees and haws of donkey', Journal of Acoustical Society of America, Volume 115, No 5, pp 2485.
7. Grindler, M. I., Krausman, P. R. and Hofmann, R. S.(2006), 'Equus asinus'. Mammalian Species, No 794, pp 1-9.
8. Groves, C. P.(1986), 'The taxonomy, distribution, and adaptations of recent equids', In: R. H. Meadow & H.-P. Uerpmann (eds). Equids in the ancient world. - Wiesbaden, Germany: Ludwig Reichert Verlag, Wiesbaden, Germany.
9. Groves, C. P.(2011), 'Horses and asses' (PowerPoint data, downloaded 02.02.2011, <http://arts.anu.edu.au/grovco/Groves%20Smeenck>)
10. Halliday, T.(2010), 'The use of domesticated donkeys as work animals in Ethiopia and the consequences for humans and donkeys'. Review prepared as part of a BSc. at Melbourne University, Australia.
11. Jones, P. A.(1997), 'Determination of optimal sex for working donkeys: experience from Zimbabwe', in P.H. Starkey & P.J. Mueller (eds), Donkey power benefits, reader, Volume 2, Reading: Animal Traction Development/ATNESA.

12. Jones, P. A.(2001), 'Must castration be selection? – The case of donkeys', Newsletter South Africa Network of Animal Traction, Volume 9, No 1, pp 12-17.
13. Jones, P. A.(2009), 'Adaptation in donkeys', Draught Animal News, No 47, pp 12-26.
14. Jones, P. A.(2010)^a, Donkeys for Development (updated edition on CD). Louis Trichardt, South Africa: Donkey Power/Animal Traction Network for Eastern and Southern Africa (ATNESA) and Agricultural Research Council of South Africa. ISBN 0-620-22177-1.
15. Rossel, S., Marshall, F., Peters, J., Pilgram, T., Adams, M. D.& O'Connor, D,(2008)'Domestication of the donkey: Timing, processes, and indicators', Proc. Nat. Acad. Sci. of the USA, 105: 3715-3720. Online 10 March 2008 at www.pnas.org/cgi/doi/10.1073/pnas.0709692105.
16. Starkey, P.(2003), 'Donkey wedding in Bangalore in July', Draught Animal News, No 35, No 35.
17. www.en.wikipedia.org/Donkey, (accessed on 2011)
18. www.lovelongears.com, (accessed on 2011)
19. www.nationmaster.com, (accessed on 2011)
20. Yanez, B. L., Burgue, J. M.(2001), 'An approach to determinate the status of the donkey in Central Veracruz, Mexico', Draught Animal News, No 35, pp 15-21.
21. Yarkin, I.(1962) Atcilik, Ankara Universitesi Ziraat Fakultesi Yayinlari, No 40, Ankara Universitesi Basimevi, Ankara.