



## The Role of Training in the Domestication Process – Traditional Nubian Methods and Ideas about Training Donkeys

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**ABSTRACT** This study involves a survey conducted among Nubian people settled in Nubia, a region of northeastern Africa that provides a habitat for the wild ass (*Equus africanus*). The aim of the survey, which involves interviewing community members, was to clarify the effects of early donkey training in order to assess the impact of human intervention at the initial stages of the donkey domestication process. The interviews covered the methods of capturing and training wild asses (by imaging) and donkeys, their ages, and the time needed for packing and riding training. Most respondents stated that they would capture wild asses and begin their early training when the animals were 1–1.5 years old, following a period of socialization. The early training, which starts by tying up donkeys in huts, is conducted when they are 1.5 years old, for approximately 2 weeks. However, foals that were reared with their mothers until they were around 1.5 years old are deemed to have mainly completed the early training; they do not need the early training by humans.

### INTRODUCTION

Mitochondrial DNA analyses have shown that wild asses made a large genetic contribution to the process of domesticating donkeys (*Equus asinus*). The breeds of asses involved include the Nubian Wild Ass (*E. africanus africanus*) and the Somali Wild Ass (*E. africanus somaliensis*), as well as one extinct species. There were at least two movements of domestication in the historical periods (Beja-Pereira et al. 2004; Kimura et al. 2011).

Earlier studies attempted to examine the specific methods and initial actions used in the domestication of Equidae by considering their behavioral ecology (Inazumi 2015; Kimura 2015; Levine 1999; Price 1999). Kimura and Tefera (2018) pointed out the importance of stress control for donkeys during the early training in Ethiopia. Baier and Reed argued that training had no effect on domestication (Herre and Rohrs 1973); however, in the field of ethology, researchers have pointed out the need to clarify the interaction between “environments×behaviors×genes.” It is high time that systems of domestication were reviewed and reconsidered (Jensen 2014).

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Human-animal intimacy reflects the extent to which animals obey humans. Training is a process that humans intentionally apply on animals to make them obedient (Herre and Rohrs 1973). An accurate understanding of age, method, and continuity are considered key to clarifying the position of “taming” in the domestication system.

This paper summarizes a survey conducted among Nubian people who are settled in Nubia, a region of northeastern Africa that provides a habitat for wild asses (IUCN 2015). As agricultural and livestock farmers since 5000 BC, the Nubian people have continued to raise and train donkeys. This survey interview focused on communities that inherited a traditional donkey culture, gathering information about actual methods, animal ages, training periods, and tools, as well as the effects of early training and the recognition of training. Ethology and ecological anthropology perspectives were used to review the methods and types of human intervention at the initial stage of donkey domestication.

### METHODOLOGY

#### Targets

#### Place and Community

The Nubian people live between the first cataract (Aswan, Egypt) and the sixth cataract of the Nile (Khartoum, Sudan), a region that has

been called Nubia (gold) since ancient times. Most Nubian people now live in Aswan, Egypt (lower Nubia) and along both sides of the River Nile (upper Nubia) (Emberling 2011). The ancient Nubian dynasty dates back to around 3700 BC. The records of Harkhuf, a governor of southern Upper Egypt in the ancient Egyptian sixth dynasty (2323–2152 BC), state that minerals, ivory, and animal skins were traded and transported using caravans of 300 donkeys in Kush (Nubia) (Geodicke 1981). It is clear that Ancient Nubia (Kush) was rich in gold mines, had daringly brave mercenaries, and maintained a ruled/ruler relationship with Egypt until the seventh century BC (Draper 2008).

For the purpose of this research, a listening survey was carried out among 20 randomly selected households in 13 villages between Aswan (Egypt) and Khartoum (the capital of Sudan) (Fig. 1). This area has a desert climate, and irrigation farming is conducted in the oasis area along the Nile River. A total of 1.5 million people speak Nubian in Egypt and Sudan. The survey targeted those who were engaged in agriculture and commerce in Egypt as well as full-time farmers in Sudan. The percentage of households raising donkeys in the target villages in Sudan was approximately hundred percent (with each household raising 1–3 donkeys); in Egypt however, the rate was slightly lower. The number of donkeys raised in Egypt was 3.35 million, while 610,000 donkeys were raised in Sudan (FAO Statistics 2014).

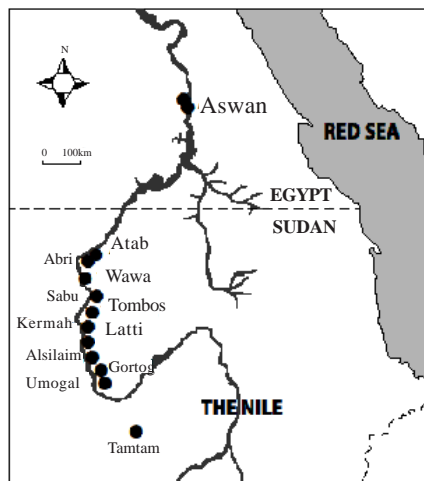


Fig. 1. Map of the research area

The topics included the methods of capturing wild asses (the wild ass is almost extinct in this area, so the respondents were asked to imagine the ways of capturing them.), the animals' age and sex, training methods, the time required for early training, and ways of training donkeys to carry riders. Questions about breeding management were asked as a reference. The survey was conducted through a semi-structured interview according to the contents of a Q&A sheet prepared in advance (Vaughn et al. 1996). Interviews were conducted with the aid of two Nubian interpreters living in each country. As the participants were full-time farmers who did not use donkey carts for industrial purposes, no questions were asked about training donkeys to pull carts. The response rates are shown as percentages (%), and answers that go beyond the questions asked are shown as the number of cases.

## RESULTS

### Purpose, Methods, and Target Ages of the Animal at Each Training Stage

#### Capture Stage

##### Purpose

This question was asked based on the premise that wild asses were captured for the purpose of taming. The respondents answered the question by using their imagination because the population of wild ass is extremely low in this region at present. The animal is listed on the red list of IUCN (CR).

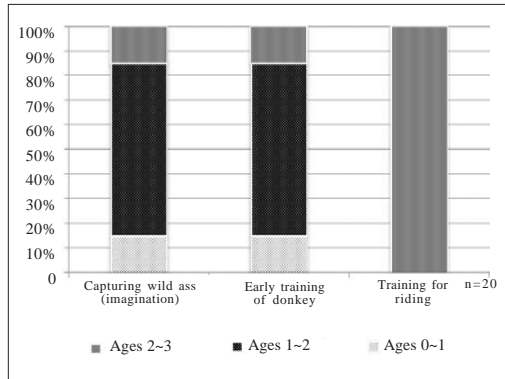
##### Methods

The methods include capturing wild asses/donkeys using ropes (80%) or by a bare-handed group of two or three people (20%). It is important to lure the animals using grass and cereals (alfalfa, sorghum) and to feed them before the capture (eight cases).

##### Target Ages

Wild asses are captured at the following ages: 6 to 10 months (15%), 1 year to 1.5 years (70%), and 2 years or older (15%). It is important for the animals to be old enough for training to start immediately. However, donkeys are not trained

to carry riders until they are 2 years old (100%) (Fig. 2).



**Fig. 2. Capturing and training ages of the wild asses and donkeys in Nubia**

***Taming Wild Asses/Donkeys to Accustom them to Humans (Early Training, Training for Carrying Loads)***

*Purpose*

The purpose is to tame untrained donkeys. This process is particularly essential for restive or disobedient donkeys, such as foals not reared with their mothers after weaning. In many cases, this process is not needed for foals reared with trained mothers after weaning, as they are already used to humans (Fig. 3). Nubian farmers recognize this stage as a period of “getting to know humans.”



**Fig. 3. Foals that grew up with their mothers till 1-1.5 years old are usually deemed not to need the early training by human**

*Method*

Tie the end of a long rope around one fore-leg of the donkey and stake the other end to the ground (90%); alternatively, tie one end of a rope around the donkey’s neck and stake the other end to the ground (100%). These methods of tying up donkeys are generally used for purposes other than training. Donkeys tied with a rope around the neck move less freely than those tied on the leg. Accordingly, even after taming, a leg rope is generally used when donkeys are grass-feeding or tied up for the night. A neck rope is usually used in the daytime to prevent donkeys from moving around freely.

The next step involves putting a halter (*sareema* in Nubian) onto the donkey’s head before being tied to a stake (100%). The halters are tightened on powerful and restive donkeys to increase their binding force. These early training methods are often carried out in enclosed stone huts (Fig. 4). The donkeys are fed twice a day (100%) and either taken to watering places or given water in tubs. The interiors of the huts are kept clean by removing manure and other dirt (four cases). Training is conducted on soft, sandy ground to prevent the donkeys and people from getting injured (two cases). Once training is completed, the halters can be loosened or removed for riding. At the next stage, a person leads a tamed donkey to water by walking with the donkey and pulling its neck rope or halter (100%). Once donkeys get used to the routine, the hours of training and distance travelled can be extended. At this point, the trainer may put a child on the donkey’s back or tie grass (used as



**Fig. 4. The colt is restrained tightly by the halter. It is going through the early training process**

feed) onto its back; in other words, it can be used as a pack donkey to carry loads at this point (100%) (Fig. 5). Around the same time, the donkeys' hair coat are cut short, and patterns are created on their skin (Egypt: two cases).

#### *Target Ages*

For this stage of training, the donkeys are between 6 and 10 months old (15%), 1 year to 1.5 years old (70%), and 2 years or older (15%) (Fig. 2).

#### *Required Period*

Within 4 days (5%), 1 week (20%), 10 days (25%), 2 weeks (45%), no answer given (25%).

#### ***Training Donkeys for Riding***

##### *Purpose*

To train donkeys to be ridden on for short distances.

##### *Methods*

If the donkeys are obedient, it is enough to put halters on them; however, to apply more pressure, a "bridle with a mouth split" (a bit made of string; *rejam* in Nubian) is used (100%). The distance is gradually increased; once the donkeys are used to it, a halter can be used instead of a bridle with a mouth split; for light riding, a simple neck rope can be used to handle the donkey. Once the donkey is trained, a saddle or saddle cloth made of hemp is used for light riding. A sack is used for packing loads and side-riding (Fig. 6). A whip stick should be used instead of a lash to whip the donkey lightly to tell it what direction to turn (Fig. 7).

##### *Target Ages*

Donkeys should be mature: Two years or older (100%) (Fig. 2).

##### *Required Period*

The same as for long-distance riding.

#### ***The Training Stage for Long-Distance Riding***

##### *Purpose*

To train donkeys for long-distance riding.

#### *Method*

Donkeys are trained using a bridle with a mouth split (a bit made of string; *rejam* in Nubian) or a bridle with a bit (100%). The distance is gradually increased, and the donkeys are trained with a rein and whip stick to follow instructions when making turns. For donkeys, a single rein connected to a bridle/halter or a neck rope is usually used (Fig. 8). Reins connected to both sides of the bridle are only used for very long-distance riding—very different from the way horses are guided. In many cases, only one rein is used. Donkeys are told which way to turn by riders who lightly hit their shoulders with a long whip stick on the side they are being asked to turn to. A whip stick is always used for long distances. Stirrups are not used; as the donkeys not very tall, riders do not need stirrups to support themselves when mounting. An unsteady rider will not feel a sense of danger. Verbal instructions such as *TORMAH* (come), *OSH* (stop), and *ALT* (go) are also used because they are effective (three cases).

##### *Target Ages*

2 years or older (100%).

##### *Required Period*

2 to 3 weeks (25%), 10 days (5%), 1 month (50%), no answer given (20%).

#### **Taming and Training - Essential and Alternative Forms of Training after Domestication**

Figure 9 summarizes Nubian training methods and ideas about donkeys in order to discover how well the animals can be tamed (made obedient) through training activities and the extent to which domestication (obedience) is genetically inherited at a group level.

## DISCUSSION

### **Common Understanding as a Background**

The Nubian Wild Ass (*E. africanus africanus*) is a critically endangered animal. The participants had not seen these animals and did not have sufficient knowledge about them. The common view was that if they must capture wild





**Fig. 5.** The donkey is used for carrying grasses for other domestic animals



**Fig. 6.** The rider sometimes side-rides the donkey without using any halter, string nor stirrups



**Fig. 7.** The whip stick is used to signal to the animal the direction it needs to turn



**Fig. 8.** Nubian riders ride on donkeys using saddles without stirrups. The man on the left uses the neck string as a makeshift halter and a single rein, while the man on the right uses the neck string directly as the single rein

asses, the training methods required for domestication would be stronger and longer but basically the same as traditional methods used to train donkeys. It was difficult for them to imagine training wild asses in a completely different way. In addition, in the regions targeted for this

survey, it is customary to castrate domestic animals to improve the quality of meat, but donkeys are not castrated because they are bred for carrying load and riding.

**Capture**

Wild asses are captured either using ropes or bare hands. There are no rope tools or traps for capturing donkeys. The survey participants clearly recognized the importance of feeding the animals before capturing them. Most respondents felt that the best age to capture a wild ass was when it was between 1.5 and 2 years old. Donkeys are considered mature at 1.5-2 years old; this was considered the lowest age at which a donkey could tolerate training or taming. The second most common answer was 6 months to 10 months. Donkeys are weaned when they are

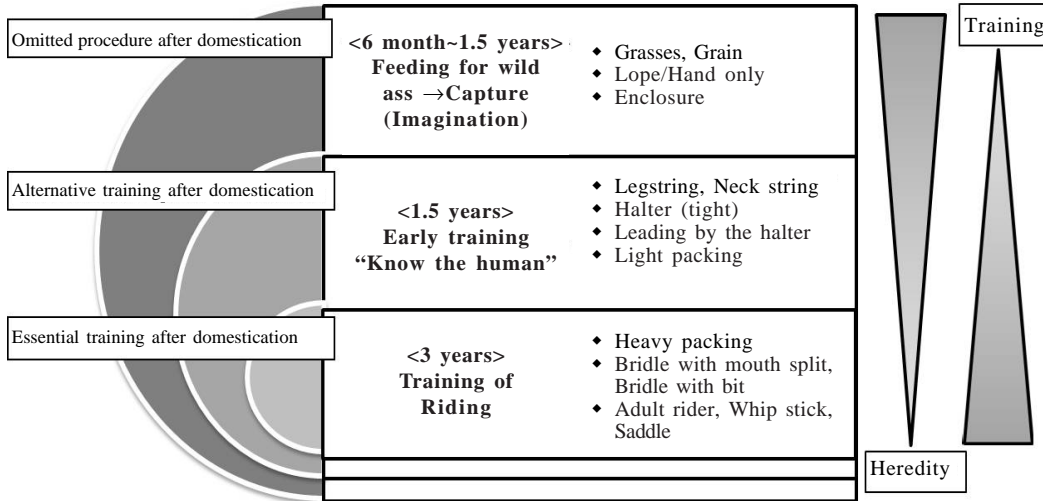


Fig. 9. Nubian training methods and ideas about donkeys

between 4 and 10 months old (French 1998; Smith 2016); the ease of capturing them during this period seems to have been taken into consideration. As is the case with horses, the optimum period of “reactivity-to-humans” for donkeys (when the donkeys react to humans most frequently, regardless of whether they know or receive indications of interest from them) is when they are around 8 months old (Lansade and Bouissou 2008). As this is considered the “socialization” (sensitive/critical) period (Price 1999), the above answer refers to the effects of taming during the socialization period, something that these farmers have learned from experience.

Dogs learn sociability during their socialization period (4-13 weeks old). It is considered important for them to build relationships with humans while playing with their owners or other dogs (Serpell and Jagoe 1999). Wild asses and donkeys, however, are still too small during their socialization period to start serious training as draft animals. The Nubian farmers, therefore, capture them once they have reached an age where both early training and riding training are possible. In addition, the basic character of dogs is formed during the socialization period; it is thought that they can fully learn sociability if they receive strict training during the juvenile period (13 weeks to 6 months old), which follows the socialization period.

The sociability period changes with domestication. For instance, the sociability or sensitive period for wolves comes earlier than that of dogs; it is longer for domesticated silver foxes (Belyaev et al. 1985; Lord 2013). It can be assumed that in the past donkeys were initially captured earlier than they are at present, given that the domestication of wild asses had just begun.

### Early Training

Most study participants defined the early training period as a time for donkeys to “get to know humans.” This early training takes anything from a few days to around two weeks. Foals reared with their mothers until they are 1.5 years old, before being trained as pack animals, are considered to have completed the early training, and so they are often exempted from this process. Given that donkeys experience a period of “reactivity-to-humans” at around eight months, foals learn to socialize with humans and other donkeys while spending time with their tamed mothers in an environment where humans are accepted. Another reason why early training cannot be conducted during the “reactivity-to-humans” period is that donkeys must acquire enough physical strength to carry loads and children before starting their early training.

An experiment was carried out on foals (horses). They received early training conducted by

touching their bodies 2 hours, 12 hours, 24 hours, and 48 hours after birth. They were also given halters to see whether the “imprinting” effects of such early training would be evident when they reached the ages of 1 month, 2 months, and 3 months. No effects were observed (Williams et al. 2002). In this case, one possible explanation for the lack of imprinting effects is that the foals were not separated from their mothers. Given the fact that the Nubian participants did not mention capturing or training foals, it seems clear that they understood based on their vast experience that early training (2-48 hours after birth) could not be expected to leave an imprint on foals that were with their mothers.

Regarding stress control during the early training, the methods of tying the mouth and twitching the ears were not used in these Nubian communities. However, pastoralists in the Afar communities of Ethiopia use the methods including forelimbs tying, jaw tying, and ears tying at the same time during early training (Kimura and Tefera 2018). A combination of these methods was observed to be a neurophysiologically effective approach that promotes obedience while controlling stress. It is assumed that the difference in methods is due to the difference in the purpose for which the donkey will be used. Afar communities use donkeys as pack animal (bringing water) only, but Nubian people use the animal for riding also. It is assumed that a dominant – subordinate relationship is needed between the human and animal specifically in the riding situation. The stressful situation in their huts with a tight halter has a strong impact on the young donkeys. On the other hand, Afar donkeys are used as pack animal only, and they are allowed to range freely in their range land, excluding during working time. Their relationship with humans is not so strict and tight, so the people do not need to subject the young donkeys to serious stress. Tying the mouth and twitching the ears do not give so much stress, due to the control of the neurophysiological effect. The above explanation supports the assumption that the different purposes of donkeys resulted in the different training methods that were developed for the animal.

Two participants from Egypt mentioned the act of cutting the donkeys’ furs short and creating patterns on their skin once they were used to the training. Caring for their hair coat has

aesthetic and superstitious values, unlike the “ear notching” or “branding” used to identify owners. The patterns (known as “hair tattoos” in some areas) are similar to those created on dromedary camels in Egypt, Pakistan, and India. Earlier examples have been seen on animals in cave paintings from the Old Stone Age (Akhtar 2016). From an ethological perspective, donkeys with patterns on their bodies are excluded from the wild ass society, as they are visually different from the others - just like “black zebras,” whose black and white patterns are different from those of ordinary zebras and contain more black than white (Kingdon 1986). Accordingly, it is presumed that creating patterns on a donkey’s hair coat at the initial stage of domestication helps to prevent captured and trained asses from returning to a wild herd.

### **Training for Riding**

Members of the community agreed that riding training should begin when the donkeys are at least two years old. In this community, training conducted using a bridle with a mouth split or halter did not move on to a stage where the donkeys wore bits. Bits are tools for adding extra loads; they are rarely used on fully tamed donkeys ridden after training. The Nubian trainers did not use bits for ordinary riding because they handled donkeys by using a lead rope, halter, or neck rope instead of a single rein. When asked how long the riding training period lasted, most participants said around one month; this was the case for domestic donkeys - more time was required for wild asses. Considering that the main advantage of domesticated animals is the short riding training period (from a few weeks to one month), it seems possible to hypothesize that “reducing the training period” is the most important goal in the process of domesticating donkeys.

### **CONCLUSION**

This study confirmed that in the Nubian community, donkeys learn through step-by-step early training about the simple tools and equipment used for riding and packing loads. They learn the meaning of signals from humans and their mothers. It is clear that people in this community have acquired a deep knowledge of the ecology and behaviors of donkeys. They understand the “socialization period,” “juvenile period,” and the best ages to start and complete

each training period to produce efficient training effects in a short time.

In the future, in addition to exploring donkeys' sensitivity toward early training, it will be necessary to define the impact of stress required for such training, taking into consideration data based on neurophysiological approaches.

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