

PHENOTYPIC CHARACTERIZATION OF CAPTIVE PONIES IN DELFT ISLAND, SRI LANKA

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SUMMARY : The objective of the study was to phenotypically characterize the captive ponies that are present in Delft Island, Sri Lanka. Four qualitative traits and sixteen quantitative traits were measured in 10 ponies (9 males and 1 female). Collected data were statistically analyzed. The body weight of each pony was estimated, and information was collected regarding their management. Mean and Standard Deviation for each quantitative trait in centimeters were: face length 39.70 ± 4.22 , face width 16.00 ± 1.67 , ear length (left) 14.90 ± 0.92 , ear length (right) 14.95 ± 0.79 , muzzle circumference 39.55 ± 3.26 , neck length 43.90 ± 2.39 , neck circumference (at throat latch) 58.70 ± 5.46 , neck circumference (at base) 78.85 ± 7.93 , neck circumference (at midpoint) 65.75 ± 13.92 , withers height 112.40 ± 5.44 , rump height 109.60 ± 5.39 , body length 67.45 ± 8.63 , heart girth 119.30 ± 11.41 , barrel girth 138.90 ± 12.27 , cannon bone circumference (front) 18.90 ± 1.70 , and cannon bone circumference (rear) 23.65 ± 1.55 . Average weight was 85.66 ± 17.41 kg. Nine out of the 10 ponies were more than 7 years old. All the ponies had brown color coats with no markings on their bodies. The feral ponies present in the island are captured at a young age using ropes for taming. The expected lifespan is 20 years. The captive ponies are allowed free grazing and are not fed with concentrates or supplements. No regular deworming, vaccination or grooming is done. The captured ponies are not allowed to breed. Starvation and death during dry seasons are the most common issues.

INTRODUCTION

Delft Island is the second largest island in the territorial waters of Sri Lanka, with an approximate area of 50 km², which is inhabited by a small population of Tamil people (Goonatilake *et al.*, 2013; Wijayawardene *et al.*, 2015). Delft ponies (*Equus caballus*, known as 'Diweldiwa pony' in Sinhala) are a feral population inhabiting the grasslands of the island (Goonatilake *et al.*, 2013). These ponies were introduced to the island by the Portuguese in 1600 and were in the hands of the Dutch from 1658 and the British from 1796 (Dissanayake *et al.*, 2017). In 1672, Philip Baldeus visited Delft Island, and stated that "horse population would increase with time and produce a tiny and hardy type of horse that can live in the wild but, must be caught by ropes and snares". In 1954 Crowe, a US Ambassador mentioned that "the stallions were better types than mares and no new blood

was introduced to their bloodline since the British period" (Goonatilake *et al.*, 2013).

At the time when Portuguese introduced the ponies to the country, they have trained the local inhabitants to use a lasso, a rope used to catch them, by which a few feral ponies were tamed (Goonatilake *et al.*, 2013). It is believed that there are about 500 feral ponies in the Delft Island in addition to these few tamed captive ponies, and they are adapted to low food and water and extreme climatic conditions in the island (Dissanayake *et al.*, 2017).

According to the Food and Agriculture Organization (FAO) guidelines, the phenotypic characterization of Animal Genetic Resources (AnGR) refers to the process of identifying distinct breed populations and describing their

characteristics and management (FAO, 2011). Many animal populations in the developing regions of the world are referred to as “unremarkable/non-descript” by lack of comprehensive information on breeds' identities and geographical distributions. Therefore, phenotypic characterization studies on AnGR are necessary for these regions in order to facilitate valid enumeration, analysis and reporting of breeds nationally and internationally (FAO, 2011). Since there is lack of scientific information available in order to characterize the captive pony population on the Delft Island, the objective of this study was to determine the qualitative and quantitative traits of a sample of those ponies.

MATERIALS AND METHODS

Study location

The Delft Island was selected for the study. Ten captive ponies were identified (9 males and 1 female), and they were included in the study with the verbal consent of the individuals who were taking care of each pony.

Collection of data on general management of Delft ponies

The information was collected and recorded on the management of captive ponies by questioning their handlers. The questions were related to methods of catching of the feral ponies, feeding, health management, different uses of the captive ponies and common diseases among them.

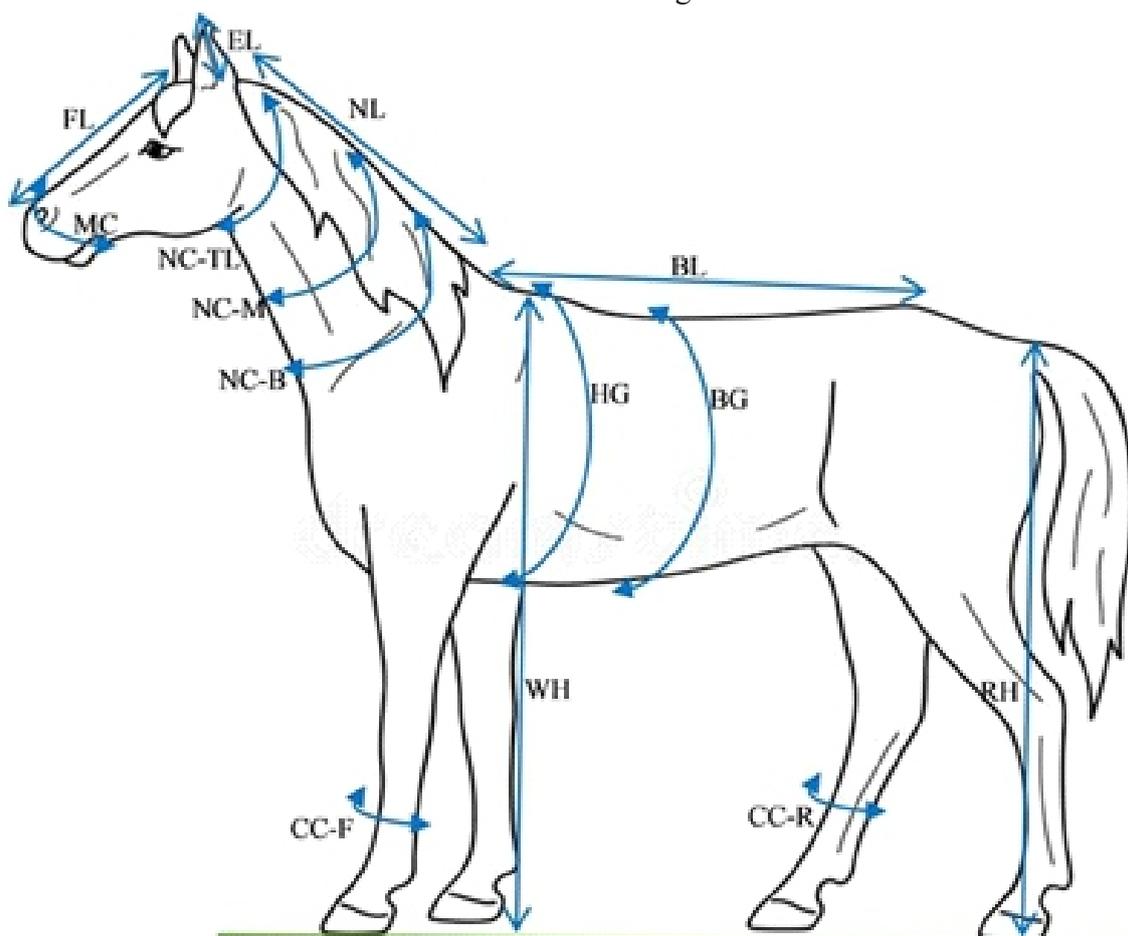


Figure 1: The measurements done on ponies as biometric indices. FL: face length, FW: face width, EL: ear length, MC: muzzle circumference, NL: neck length, NC-TL: neck circumference at throat latch, NC-M: neck circumference at midpoint, NC-B: neck circumference at base, WH: withers height, RH: height at rump, BL: body length, HG: heart girth, BG: barrel girth, CC-F: front cannon bone circumference, and CC-R: rear cannon one circumference.

Evaluation of quantitative traits

Sixteen biometric indices of the ponies, as illustrated in Figure 1, were measured in centimeters, and recorded. These included face length (FL), face width (FW), left ear length (EL-L), right ear length (EL-R), muzzle circumference (MC), neck length (NL), neck circumference at throat latch (NC-TL), neck circumference at midpoint (NC-M), neck circumference at base (NC-B), withers height (WH), height at rump (RH), body length (BL), heart girth (HG), barrel girth (BG), front cannon bone circumference (CC-F) and rear cannon one circumference (CC-R).

The bodyweight of each pony was estimated according to the following equation which was developed by Carroll and Huntington in 1988 and was confirmed to be 99.6% accurate (Ellis and Hollands, 1998).

$$\text{Weight (kg)} = \frac{(\text{girth measurement in cm})^2 \times (\text{length in cm})}{11,877}$$

Evaluation of qualitative traits

Four qualitative traits including coat color, patterns of the skin, head markings and leg markings were observed in each animal and the data were recorded.

Data Analysis

Collected data of the body measurements were statistically analyzed using Minitab Software package to determine the Mean, Standard Deviation (SD), minimum value and maximum value of each measurement.

RESULTS

Management of the ponies

The captive ponies were allowed free grazing in the lands of their owners and in communal lands (Figure 2). They were not fed with any cut fodder or concentrated feed. The

ponies drink water from nearby ponds or wells while they are free grazing. They were not provided with vitamin or mineral supplementation, regular deworming, and vaccination. There were no health records maintained of the ponies. Very poor grooming of the ponies was observed with only intermittent bathing and trimming of the fur coat. The captured ponies were not allowed to breed unless they escaped from the custody. They are being used for several purposes including pony races which are held in the Delft Island every year, and for catching other feral ponies and free-ranging cattle. Starvation and death due to the harsh conditions during the dry season are some of the main issues through which the ponies survived.

Most of the captive ponies present in Delft Island were caught at the age of 5-6 months. In the wild, the foals/fillies were isolated by chasing away the mother. The isolated young ones were captured using ropes and snares (Figure 3) by a person riding another pony. According to the handlers, the catching ability is inherited through generations. Once the ponies are caught, they are kept tied for a few months in one place until they get adapted to the captivity. The expected life span of a pony is about 20 years.

Quantitative traits

The Mean, Standard Deviation, minimum value, and maximum value for each quantitative parameter measured in centimeters are shown in Table 1.

Qualitative Traits

Age of 9 out of the 10 ponies was more than 7 years. Only one pony in the sample studied was female, while the rest (9) were males. All the ponies had brown color coats (Figure 4), and none of them had head or leg markings.



Figure 2: Feral and captive ponies grazing in communal lands



Figure 3: Ropes and snares used to catch the feral ponies

Table 1: Summary of the biometric indices of captive Delft Ponies (n=10)

Phenotypic Trait	Mean \pm SD (cm)	Minimum Value (cm)	Maximum value (cm)
Face length	39.7 \pm 4.2	36	47
Face width	16.0 \pm 1.6	14	19
Ear length (left)	14.9 \pm 0.9	14	16.5
Ear length (right)	14.9 \pm 0.7	14	16
Muzzle circumference	39.5 \pm 3.2	33	45.5
Neck length	43.9 \pm 2.3	40	48
Neck circumference (at throat latch)	58.7 \pm 5.4	46	63.5
Neck circumference (at a base)	78.8 \pm 7.9	66	91.5
Neck circumference (at midpoint)	65.7 \pm 13.9	42	94
Withers height	112.4 \pm 5.4	99	121
Rump height	109.6 \pm 5.3	97	118
Body length	67.4 \pm 8.6	56	88
Heart girth	119.3 \pm 11.4	94	130
Barrel girth	138.9 \pm 12.2	117	151
Cannon bone circumference (front)	18.9 \pm 1.7	17	22
Cannon bone circumference (rear)	23.6 \pm 1.5	20	26

The Mean estimated body weight of the selected ponies was 85.6 ± 17.4 kg.



Figure 4: Brown body colour typical of the captive ponies in Delft Island

DISCUSSION AND CONCLUSION

The feral ponies in the Delft Island graze differently from sheep and have a wider diet than captive ponies. They eat soft rush, Molinia, gorse and mountain grasses (Goonatilake *et al.*, 2013). Their grazing and trampling help to keep bracken and gorse under control and create pathways. They are essential in maintaining the landscape of the mountains.

The capture of Delft ponies was carried out at 5-6 months of age. Free grazing is the common way of feeding, thus starvation and death of the ponies are common during the dry season. No supplementation, preventive care or grooming is done for them. The captured ponies are used for racing and capturing other feral ponies and cattle.

To our knowledge, this is the first scientific study carried out in order to determine the biometric characteristics of the captive pony population in Delft Island, Sri Lanka. In comparison with the body measurements of the Spiti, a mountain pony breed (Gupta *et al.*, 2012), Delft ponies have lower face length, ear length, height at withers, body length, and heart girth, whereas Delft ponies have higher face width. Compared to Terceira ponies (Lopes *et al.*, 2015), Delft ponies have lower face length, face width, neck length, withers height, rump height, body length, heart girth and higher cannon bone circumference in both fore and hind limbs.

The results of this study may provide insights for future studies and international identification of the captive pony population in Delft Island, Sri Lanka.

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