

## A STUDY ON SRI LANKAN NATIVE CATTLE IN SOUTHERN PROVINCE, SRI LANKA

W.P.S.N. Wijeweera, P.G.M. Kalpani, K.A.M. Sudarshani and H.C.E. Wegiriya

Department of Zoology, University of Ruhuna  
Matara, Sri Lanka

E-mail: hemantha@zoo.ruh.ac.lk

**Abstract:** In the past, Sri Lankan native cattle or indigenous zebu (*Bos indicus*) were used commonly in ploughing, puddling and for threshing paddy. By today, the abundance of Sri Lankan native cattle is extremely rare due to the introduction of cross breeds and the application of new breeding methods. The present study was carried out to study the distribution, population structure, characteristics and external parasites of Sri Lankan native cattle in Southern province. The results of this study revealed that, the mean weight of studied sexually matured cattle was  $198.86 \pm 7.14$  (Kg) while the mean height was  $100.09 \pm 1.41$  (cm). Identified specific features of studied cattle were small body size, high heat tolerance and low tick abundance. The mean abundance of ectoparasitic ticks on dewlap and ear region of studied cattle was  $5.24 \pm 1.21$  (cm<sup>2</sup>),  $4.44 \pm 0.73$  (cm<sup>2</sup>) respectively. Identified tick species were *Boophilus sp.*, *Aponoma sp.*, and *Haemaphysalis sp.* The most abundant tick species was *Aponoma sp.* Findings also indicate that these isolated cattle populations are under the threat of extinction due to mixing with the introduced crossbreeds and the negligence of owners etc. The present study emphasizes the importance of conservation of this native cattle species with high tropical adaptability for future of small-scale dairy industry of the country.

**Keywords:** Sri Lankan native cattle, *Aponomasp*, *Boophilus sp.*, *Haemaphysalis sp.*

### I. INTRODUCTION

Cattle farming are a key component in Sri Lankan agriculture. Primarily, they provide high quality protein by producing milk, dairy products and meat. In addition, native cattle are a primary source of renewable and low cost draught power for a variety of agricultural operations and transport [1]. With the arrival of Europeans in the 16th century, consumption of milk and meat became popular. Cattle farming have been organized into an industry with dairying as the primary purpose. Large-scale introduction of exotic dairy cattle has continued in order to improve the productivity of the sector [4]. However, the introduction of cross breeds and Artificial Insemination (AI) led to the significant drop in the number of Sri Lankan native cattle during the past two decades [2]. Therefore by today the native breed

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have nearly being died out. Indigenous cattle in Sri Lanka are *Bosindicus* type (“Zebu cattle”) which are well adapted and concentrated in the dry zone. Indigenous cattle are small in body size and stature. In addition to that, they are characterized by the poor development of hump and dewlap compared with most other tropical cattle in the world [3]. The most of tropical breeds are known to possess high degree of heat tolerance, resistant to ticks and tick-borne diseases and to many other diseases and low nutritional requirements [6]. Local milk production in Sri Lanka is not sufficient for the current demand of national consumption. Therefore, the Government of Sri Lanka has given high priority for dairy development [1]. To achieve this target utilization of crossbreeds will be intensified and that may cause further disappearance of the native cattle in isolated pockets. On the other hand, favorable genes of Sri Lankan native cattle can be used in this intensification programme in appropriate manner. As such, it is essential to conserve the gene pool of Sri Lankan native cattle under conservation process.

## II. MATERIALS AND METHODS

The study was carried out in three sites namely Galle, Matara and Hambantota in Southern province of Sri Lanka where no surveys on native cattle has been conducted. The temperature and rainfall of each site were gathered from the metrological department of Sri Lanka. Initial survey was conducted to identify the native cattle in each study area. The data was collected by visiting individual native cattle farmers. Background information about cattle was collected using a questionnaire. Information on the distribution, population structure, tropical adaptations and tick infection of native cattle were collected. In addition, information of usage of SriLankan native cattle and traditional medicine for cattle diseases were also recorded. The height of cattle was measured using a tape and weight was measured using the weight band [8]. To study the tick abundance, tick counts were done in 5cm<sup>2</sup> area of dewlap and ear lobe regions of cattle. The collected tick samples were preserved in 70% alcohol solution [7]. In the laboratory each tick specimen was examined under dissecting microscope and identified using a taxonomic pictorial key [5]. Minitab version 16.0 for windows 2007 was used to analyze data.

## III. RESULTS

According to the bioclimatic zonation of the country, Galle and Matara are situated in wet zone while Hambantota is situated in dry zone of Sri Lanka. The annual temperature and rainfall of selected sites were given in table 1.

**Table 1:** Metrological data of sites

Site	Annual temperature (°C)	Annual rainfall (mm <sup>3</sup> )
Hambantota	30	1250
Galle	27.5	2500
Matara	27.5	2000

The information about the cattle at each site is summarized in table 2.

**Table 2:** cattle information in selected sites

Site	No. of cattle	Sex ratio (F:M)	Adult : calf ratio
Hambantota	21	19:2	17:4
Matara	05	3:2	4:1
Galle	08	7:1	7:1

\*F- Female \*M- Male

The growth measurements of studied adult cattle are shown in table 3.

**Table 3:** growth measurements of adult cattle

Site	Mean Weight (Kg ± SE)	Mean Height (cm ± SE)
Hambantota	206.41±6.50	102.26±1.26
Matara	173±26.4	94.50±5.27
Galle	195.3±18.9	98±3.48

\*SE- Standard Error of mean

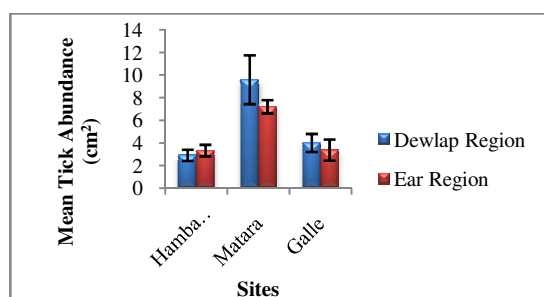
The mean weight and height of all studied adult cattle in all sites were  $198.86 \pm 7.14$  Kg and  $100.09 \pm 1.41$  cm respectively. In all sites, studied cattle were reared under free-range management system. The reproductive performance of selected cattle is shown in table 4.

**Table 4:** reproductive performance of selected cattle

Age range ( Years)	Reproductive status	No. of cattle		No. of litter	Mean no of litter (n ± SE)
		F	M		
3*	Non-reproductive	3	3	0	0
3>X<8	Reproductive	1 7	2	31	1.632±0.26
8>X<12	Reproductive	4	0	19	4.75±1.25
X>12	Reproductive	3	0	38	12.67±3.18

\*X- Age

The mean tick abundances of studied cattle were  $16.80 \pm 2.58$  in Matara site and  $7.38 \pm 1.45$  in Galle site while  $6.381 \pm 0.757$  in Hambantota site. There is a highly significant difference ( $P=0.000$ ) in the mean tick abundance among three study sites. The mean tick abundance of two regions (dewlap region and Ear region) of studied cattle is shown in figure 1.



**Figure 1:** Mean tick abundance in dewlap region and ear region of cattle

All studied cattle were infested with hard ticks. No soft ticks were recorded. Identified tick species were *Boophilus sp.*, *Aponoma sp.*, and *Haemaphysalis sp.* The most abundant tick species was *Aponomas p.* Characteristic features of studied cattle are small body size as well as stature, presence of small upright ear lobes, less hair thickness and non-shiny appearance of body coat. The information gained through personal communication revealed that Sri Lankan native cattle are used in agriculture, transportation and dairy production to certain extent.

The owners of native cattle practice traditional methods to protect cattle from diseases such as fever, cold, lame of hind limbs, loss of appetite and diarrhea. As treatments decoction, plant extractions are given. In addition, exposures of cattle to herbal smokes are also practiced. Honing is done by drawing special symbols on cattles' body, which connects sensitive points or "Nila points" of the cattle and this method is similar to acupuncture technique which performed to cure diseases in humans.

#### IV. DISCUSSION

Sri Lankan native cattle appear to be well adapted to the dry zone where ideal conditions are prevailing in Hambantota [3]. In addition, less urbanization and the presence of grazing areas in large scale may provide favorable conditions for their survival. This may be the reason for the highest abundance and growth measurements of native cattle in Hambantota site than other two sites. The present study shows that the females were more abundant in all sites. In Sri Lanka, country with strong religious and cultural basis dairy industry prefer more female calves. It is not profitable to rear male calves. As such, with reluctance dairy farmers have to sell male calves as early as possible. Information gained through interviews with cattle

farmers revealed in general native cattle tend to produce more female calves. These two reasons may lead to the reduction of number of male cattle in a herd. The small size of studied cattle is an advantage to handling in cattle management. Generally, a calf reaches puberty at age of 3 years and the lifespan of female is long. This may cause the more adults in a herd than calves as given in table 2. The findings of this study showed that the native cattle have more than twelve year fertile period. Although the farmers do not apply tick control measures the mean tick abundance of studied cattle was comparatively low than cross breed types [9]. Hard ticks generally spend most of their life on the ground or on vegetation cover waiting for a host [5]. This might be the reason for the highest tick abundance in Matara site, which consists of thick vegetation cover than the other two sites. In studied cattle, ticks were present not only in ear and dewlap regions but also in perennial region and tail region. But at a glance the tick abundance was higher in dewlap and ear regions than perennial and tail regions. Therefore dewlap and ear regions were selected to count ticks for the study. The results showed that the mean tick abundance was high in dewlap region of all studied cattle. Observation during this study indicated that birds are the main tick controlling agents. Regions where birds cannot reach easily such as dewlap may have high abundance of ticks. In tropical region the main problem of cattle is to regulate the internal body temperature. It is easy to emit heat when reduction the body size or increase certain body areas for heat emission. As such most of the tropical breeds with large body size have well developed hump and dewlap. On the other way, studied cattle have achieved that target by having small body size with small hump and dewlap. According to the personal communication usage of indigenous medicine to treat native cattle exceed the usage of modern veterinary treatments. More surveys are essential to gather indigenous knowledge in treatments of cattle, which is dying out day by day. Finally results of the study indicate that native cattle of Sri Lanka have characters such as small dewlap, hump and body size which might be adaptive features for the environment in Sri Lanka. Since this cattle population in southern province is diminishing, conservation programs are essential to conserve the gene pool of this native breed.

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**REFERENCES**

- [1] B.M.A.O. Perera, and M.C.N. Jayasuriya, “The dairy industry in Sri Lanka: current status and future directions for a greater role in national development”, J. Natn. Sci. Foundation Sri Lanka, vol. 36, pp. 115-126, 2008.
- [2] D.M. Karunadasa, “An evaluation of the dairy cattle farming of Monaragala District in Sri Lanka”, A study with reference Pahalagama G.N. division of Buttala D.S. division. Department of Geography, University of Colombo, Sri Lanka, 2013.
- [3] H. Abegunawardena and W.D. Abayawansa, “Studies on indigenous zebu cattle. 1. reproductive pattern under traditional management”, J.Natin. Sci. Coun. Sri Lanka, vol. 23(4), pp. 131-142, 1995.
- [4] H. Abeygunawardena, D. Rathnayaka, and W.M.A.P. Jayatilake, “Characteristics of cattle farming systems in Sri Lanka,” J. Natn. Sci. coun. Sri Lanka, vol. 25(1), pp. 25-38, January 1997.
- [5] H.D. Pratt, and K.S. Litting, “Ticks of public health importance and their control”, U.S. Department of health ,education and welfare public health service, pp. 30-36,1967.
- [6]. H.W. Mwatawala, and G.C. Kifaro, “Reproductive performance of artificially and naturally bred Boran heifers and cows under ranch conditions in Tanzania”, Journal of Animal & Plant Science, vol. 4(1), pp.267 – 275, 2009.
- [7] I.B.G. Alkareem, A.E. Abdelgadir, and K.H. Elmalik, “Study on prevalence of parasitic diseases in cattle in Abeyi area-Sudan”, Journal of Cell and Animal Biology, vol. 6(6), pp. 88-98, 2012.
- [8] P. Stephen Hammack, and J. Ronald Gill, “Frame score and weight of cattle”, Texas agricultural extension service, Texas, 1914.
- [9] W.P.S.N. Wijeweera, K.A.M. Sudarshani, and H.C.E. Wegiriya, “Prevalence of ticks and tick-borne blood parasites in selected cattle farms in Mirigama veterinary range in Sri Lanka”, Adstract proceedings, RISTCON, 2014.