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Behavioral Characterristics of Sri Lankan Elephants

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Introduction

Elephants behavioral characteristics will provide scientists unparalleled opportunities to study on an elephant, including female interactions, cow/calf relationships, bull behavior, cognition, mate choice, and more. Elephants are extremely intelligent animals and have memories that span many years. It is this memory that serves matriarchs well during dry seasons when they need to guide their herds, sometimes for tens of miles, to watering holes that they remember from the past. They also display signs of grief, joy, anger and play. The researches on elephants will help us to understand how elephants use infrasound communication, and use this knowledge to increase opportunities for interactions among elephants. With the largest brain of any mammal, elephants are highly intelligent and have an impressive memory. Therefore, they hold a special place with humans, from a remarkable intelligence to a prominent role in Asian culture and economy. This paper reviews the behavioral inherent attribute of Sri Lankan elephants and threats to the elephants.

At the turn of the 20th century, there were about 100,000 wild Asian elephants. Today, there are an estimated between 35,000 - 40,000 wild Asian elephants. The size of wild elephant populations in Sri Lanka was estimated at 12,000 to 14,000 in the early 19th century; 10,000 in the early 20th century; between 1,745 and 2,455 individuals in 1969 and between 2,500 and 3,435 in 1987. Although, in 2000 there were between 3,150 and 4,400 wild elephants in Sri Lanka, this population was reduced to 2,900-3,000 in 2007. On the basis of counting elephants at water holes in the dry season, it shows about 5,879 in 2011 (Kotagama 1991: 24; Wanigasundara 1991: 16-17; Jayewardene 1997: 100; Fernando 1999: 38-44; Fernando et al 2011: 93-103). Wild elephants are present in 50 countries, 13 of which are in Asia and 37 in Africa (Perera 2009: 41-52). The Sri Lankan elephant population has fallen almost 65% since the turn of the 19th century. Today, the Sri Lanka elephant is protected under the Sri Lankan law and killing one carries the death penalty.

As a social animal, Asian elephants have strong family ties (Fig. 1). They engage in greeting ceremonies, complex communication, courtship, teaching, and communal care. Female family members often stay together their entire lives. Mothers and aunts protect calves when they are threatened. Asian elephants have also been known to stay behind with a sick or injured herd mate. Asian elephants, including Sri Lankas, are clever, curious, and good-natured. They are adept at tool use, which they learn from the older members of the herd. They use branches to scratch themselves or to remove flesh

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from their bodies. They use their trunks to throw objects purposefully—out of play, curiosity, defense, or aggression.

Basic Essentials about Elephants

The Sri Lankan subspecies are the largest and also the darken of the Asian elephants, with patches of chromatism, on its ears, face, trunk and belly. The herd size in Sri Lanka ranges from 12-20 individuals or more. It is led by the oldest female, or matriarch. In Sri Lanka, herds have been reported to contain nursing units, consisting of lactating females and their young, and juvenile care units, containing females with juveniles.

fig. 1 An elephant family at Wilpatthu National Park, about five km to the north of Kala Oya Bride,Puttalam-Mannr road (Photo by J. Kaupotha).

fig. 2 Sri Lankan elephants diet consists of eating a wide variety of vegetation including grasses. Photo by J. Katupotha (Monaragala – Batticaloa road).

Sri Lankan elephants are herbivorous animals, meaning that they only eat plants and plant matter in order to gain all of the nutrients that they need to survive. Sri Lankan elephants diet consists of eating a wide variety of vegetation including grasses (Fig. 2), leaves, shoots, barks, fruits, nuts, roots and seeds. Between 60 and 70% of the plant species found in its habitats are consumed by the elephants, but they may have a pref-erence for a few plant species. Studies on the composition of the diet of wild elephants in Sri Lanka and their feeding behaviour indicate that a variety of plant species is consumed (Jayewardene: 1997, 29). Jayewardene (1997: 30) emphasized that three successive feeding cycles of the elephant can be identified as: Rapid movement and low feeding rate; Little movement and high feeding rate; and Moderate movement and relaxed feeding.

Elephants are also known to eat crops like banana (*Musa acuminata)* and sugarcane (*Saccharum officinarum)* which are grown by farmers. Adult elephants eat 300-400 lbs of food per day. The calf was suckled by the mother while she was fed only with actual (*Caryota urens,* a kind of palm tree), Jak (*Artocarpus heterophyllus*) leaves, grass and branches from local trees such as *Ficus religiosa*, *Cocos nucifera* etc. (Siripala 1989: 16). About 100 kg of the above varieties was given to the mother every day. Only a very limited quantity of sweet food such as banana, papaw and pineapple was given daily. The calf was wormed when it was 4 months old and later when it was 8 months old.

By the time the calf was 6 months old, it began to try feeding on what the mother was being fed. Sri Lankan elephants often use their long trunk to assist them in gathering food. The Sri Lankan elephant has smaller ears than the African elephant and also has a more curved spine. Unlike the African elephants, the female Sri Lankan elephants very rarely have tusks, and if the females have tusks, they are generally barely visible and can only be seen when the opens her mouth.

The Sri Lankan elephant strictly follows migration routes that are determined by the rainy and dry periods, particularly monsoon season. The eldest herd is responsible for remembering the migration route of its herd. During the migration problems arose when farms where built along the migratory routes and the elephant herds caused a great deal of destruction to the newly built farmland across their routs.

Behavioral Characteristics

Elephants found in different parts of the country have been observed to differ in stature and size. In the historical past, elephants were widely distributed from sea level to the highest mountain ranges. They occurred in the dry zone, in the lowland wet zone as well as in the cold damp montane forests. These differences do not mean that they are different subspecies, but are variations due mainly to the effects of the environment in which they live and the food that is available (Jayewardene 1997: 16-18). There is the well known k*uru aliya* or dwarf elephant which is found in most parts of the country, especially in the Southern, North Central and Eastern Provinces. This elephant is called the *ruhunu getaya* in the Ruhuna or southern part of the country and known as *kuru parva* in the other two provinces. The elephants in the Sabaragamuwa and Uva Provinces are big animals that hold their prominently-domed heads high and walk with magnificent steps. Their range extends to the Sinharaja Forest and in the other direction to the northern parts of Yala through Lahugala and Gal Oya to even Wasgomuwa and Maduru Oya National Parks. The dome 0n the head is known in Sinhala as the *kumbastale*. Jayewardene explains (1997: 17) the quality of an elephant for purposes of work and ceremony is judged by its forehead and the shape of its back. The tuskless marsh elephant, Eleplzas maximus vialiya (Deraniyagala) or vil-aliya in Sinhala, is a unique subspecies which is found in the flood plains of the Mahaweli river. The tuskless marsh elephant, Eleplzas maximus vialiya (Deraniyagala) or vil-aliya in Sinhala, is a unique subspecies which is found in the flood plains of the Mahaweli river,

Elephant family

Elephants form deep family bonds and live in tight matriarchal family groups of related females called a herd. The herd is led by the oldest and often largest female in the herd, called a matriarch. Herds consist of 8-100 individuals depending on terrain and family size. When a calf is born, it is raised and protected by the whole matriarchal herd. Males leave the family unit between the ages of 12-15 and may lead solitary lives or live temporarily with other males (Fig. 3). Elephants live in a very structured social order. The social lives of male and female elephants are very different. The females spend their entire lives in tightly knit family groups made up of mothers, daughters, sisters, and aunts. These groups are led by the eldest female, or matriarch. Adult males, on the other hand, live mostly solitary lives.

The social circle of the female elephant does not end with the small family unit. In addition to encountering the local males that live on the fringes of one or more groups, the female's life also involves interaction with other families, clans, and subpopulations. Most immediate family groups range from five to fifteen adults, as well as a number of immature males and females. When a group gets too big, a few of the elder daughters will break off and form their own small group. They remain very aware of which local herds are relatives and which are not. The life of the adult male is very different. As he gets older, he begins to spend more time at the edge of the herd, gradually going off on his own for hours or days at a time. Eventually, days become weeks, and somewhere around the age of fourteen, the mature male, or bull, sets out from his natal group for good. While males do live primarily solitary lives, they will occasionally form loose associations with other males. These groups are called bachelor herds. The males spend much more time than the females fighting for dominance with each other.

Social Structure

The social structure of elephants is complex, varying by gender, and population dynamics. Adult elephants form matriarchal (female-led) societies. Elephants are known for their superior intelligence in addition to their structured social order. One of the main characteristics of the social order in the herd is that males and females live an entirely different and separate lives. Adult males are usually solitary *(seaworld.org/-infobooks/elephants/behavior)*. This indicates that adult male elephants are solitary in nature, but may associate with other bulls (adult males) in small, unstable groups.

The males will leave the family unit (natal unit) between 12 and 15 years of age. Bulls that associate in small groupings have a hierarchal-ranking social structure. Leaders, determined by age and strength, protect the front and rear of the herd. More docile (quiet-natured) bulls do not seek leadership roles, but serve as stabilizing members within the group. Hierarchical roles are re-established and re-adjusted whenever a male leaves or enters the group. The female social structure is similar to concentric rings, with the innermost circle comprising a family unit of related adult cows (females). Family units range in size from three to 25 individuals; including the eldest, most dominant female called the matriarch, her adult daughters, and their calves, and a number of juveniles. From this stable core, the groupings widen to include less familiar individuals.

Social Behavior

Bulls assess each others strength through sparring or play-fighting. The level of dominance is closely related to a bull's size, power, and weight. As bulls mature, these characteristics increase. Bulls that are in musth are particularly dominant and non-musth bulls and younger males avoid confrontations with them. The complex nature of elephant social structure is extended into the mourning behavior for deceased companions. When elephants come across deceased remains of other elephants, a silent pause is taken, as the remains are touched with their trunks. Occasionally tusks or bones are carried with them, as the herd continues to travel. Elephants are not territorial. The home range is between 10 and 70 km2 (four to 27 mi.2) and possibly larger, depending on herd size and seasonality.

Elephants sleep about approximately four hours a night. About two hours of that are spent standing. During deep sleep, individuals lie on their sides, breathing noisily, and sometimes snoring. A top speed of an elephant is 30 kmh (18 mph.) over short distances has been recorded for elephants. Elephants have been described as having an ambling (easy-going) walk at a normal rate of six to eight km/h (3.6 to 4.8 mp/h.). Bathing appears to be pleasurable and is essential to elephants. The trunks are used like a hose to spray water across the body. To help protect the skin from parasites and biting insects, elephants wallow in mud or spray dust on their wet skin. Once the mud and dust is dry, elephants rub against a hard surface, removing most parasites.

Reproduction

Only the most dominant males will be permitted to breed with cycling females. The less dominant ones must wait their turn. It is usually the older bulls, forty to fifty years old, that do most of the breeding. The dominance battles between males can look very fierce, but typically they inflict very little injury. Most of the bouts are in the form of aggressive displays and bluffs (Fig. 4). Ordinarily, the smaller, younger, and less confident animal will back off before any real damage can be done. However, during the breeding season, the battles can get extremely aggressive, and the occasional elephant is injured. During this season, known as musth, a bull will fight with almost any other male it encounters, and it will spend most of its time hovering around the female herds, trying to find a receptive mate.

fig. 3 Males leave the family unit between the ages of 12-15 and lead solitary lives. Photo by J. Katupotha, Ragamwela Ela, right bank, Sasthrawela.

fig.4 The bull towered over the small female for unsusal sex. (Photo, Chandima Fernando - Sri Lanka Wildlife Conservation Society.

Mating Season of the Sri Lankan elephants is mostly during the rainy season. Females are generally able to breed by the time they are 10 years old, and give birth to a single calf after 22 months gestation period. When the calf is born, it weighs about 100 kg, and is cared for not only by its mother and also by other females in the herd (known as aunties). The infant elephant remains with its mother until it is around 5 years old and gains its independence, with males often leaving the herd and female calves staying. At birth, a calf's trunk has no muscle tone, therefore it will suckle through its mouth. It takes several months for a calf to gain full control of its trunk.

When habitat conditions are favourable, female elephants may give birth to a calf every 2.5-4 years. After several months, the calf begins to eat grass and foliage. However, it stays under the supervision of its mother for several years, starting to make its first independent moves when it is around 4 years old. Both males and females may become sexually mature as early as 9, but males do not usually start sexual activity until they are 14 or 15. And even then they are not capable of the social dominance that is usually necessary for successful reproductive activity, especially as most elephants only reach their full size at about 17 years of age. Males have a sexually active period, called musth, that lasts for months, while females are receptive for just a few days (Fig. 5).

During the period of musth, males search for females while advertising their heightened sexual and aggressive state with particular behaviors, secretions, and a pulsating musth-rumble, which is given while waving one ear at a time. An estrous female secretes from her temporal glands, urinates, and makes a series of powerful estrous-rumbles after mating, to attract the attention of any distant higher-ranking males, as heard here. Family members add their voices by giving a cacophony of calls in a mating-pandemonium.

Greeting Ceremony

The greeting ceremony is key to cementing bonds in an elephant family. Elephants vocalize a greeting-rumble as they hold their heads high, vigorously flap their ears, and reach out and touch family members with their trunks (Fig. 6). They secrete from their temporal glands, urinate, and defecate. Sometimes they show their excitement about being back together by clanking tusks together and spinning around, as if doing pirouettes.

Intelligence

As a large mammal, the elephant is a remarkable and astute animal. Coupled with this it has a very retentive memory, quick to learn and slow to forget, capable of receiving instructions and understanding them. The elephant always thinks and as a result continues to learn. Even in the jungle the elephant is able to adapt to changing situations and environments because of its ability to think

fig. 5 The bull towered over the female for ususal sexually active period called musth, that lasts for months, while females are receptive for just a few days.

fig. 6 Two female elephants reassuring each other with a strange trunk to mouth greeting (www.birminghammail.co.uk).

(Jayewardene 1997: 35). In its constant conflicts with man, the elephant is able to overcome all obstacles, including electric fences that man puts in its way in the course of protecting his crops, because of its intelligence and ability to think. Sometimes an elephant's natural docility is misinterpreted as a lack of intelligence.

Sounds

From powerful roars to low-frequency rumbles, elephants use a variety of vocalizations to communicate. Their sounds also include snorts, barks, grunts, trumpets, cries, and even imitated sounds. These indicate that an elephant emit a variety of sounds, both from the trunk and the mouth. They roar, trumpet, growl, snort, squeak, bark and rumble. These are different forms of communication and sometimes associated with particular actions (Jayewardene 1997: 36). Jayewardene emphasizes that the shrill snort which is made by blowing through the trunk and which indicates anger and rage, generally precedes or accompanies a charge. The other is a loud trumpeting that is made in the course of their feeding. A deep groan or grunt from the throat indicates that the elephant is in pain or that it is compelled to do something against its will.

Swimming

There are reports from various parts of Africa and Asia of instances of elephants swimming both in inland waters and in the sea. Elephants are very good swimmers and have been known to swim for long periods (Jayewardene 1997: 36). Jayewardene (1997) emphasizes that the first recorded instance of a sea swim in Sri Lanka is of an elephant that swam across the Trincomalee harbour to Sober Island. According to Jayewardene, some reports mentioned that a high elephant, about ten feet in height, swimming across the Senanayake Samudra in Gal Oya, Sri Lanka.

In 1961 when the Department of Wildlife was trying to capture two elephants from the Trincomalee dock-yard both animals had swum across the harbour to Crow Island. They had come back later and one was captured. The other had reportedly swum again from Nicholson's Cove to Sober Island and then swum across the Bay to the jungle on the mainland there. This elephant, according to estimates was 1.4 to 1.5 m. The other elephant was 2.4 m tall and may have been the animal described in the earlier paragraph. These elephants could very well have been swimming at night to Sober Island regularly over this period without being noticed. Though it is well established that elephants can swim there is a record of an elephant that had fallen into the Malala river near Hambantota, being dragged out to the sea.

Threats

Encroachment of habitat, keeping the elephants by politicians and their followers, capturing the elephants as savage and the ivory trade are the greatest threats in Sri Lanka. The threat to the African elephant presented by the ivory trade is unique to the species. Another threat to elephant's survival in general is the ongoing cultivation of their habitats with increasing risk of conflicts of interest with human cohabitants. The Asian elephant's demise can be attributed mostly to loss of its habitat. Elephants need massive tracts of land because, much like the slash and burn farmers, they are used to crashing through the forest, tearing down trees and shrubs for food and then cycling back later on, when the area has regrown (World Animal Foundation). As forests are reduced to small pockets, elephants become part of the problem, quickly destroying all the vegetation in an area, eliminating all their resources. Larger, long lived, slow breeding animals, like the elephant, are more susceptible to overhunting than other animals. Senanayake mentions that as a country that prides itself on the proper practice of Buddhist principles and values it is still saddening to see that we don't really practice what we preach. There are numerous cases where minsters, members of parliament and religious leaders have come under fire for keeping of elephants as pets. However, tourists can enjoy watching and photographing and to going on elephant back safaris in national parks, it is needed to train elephants to meet the owners objective. Accordingly the cruel trainers molests and follows harmful and painful activities. In order to make elephants submit to elephant rides and other human interactions they are taken from their mothers when babies and forced through a horrific training process. This involves physical restraints, inflicting severe pain and withholding food and water. That shows the brutal behavior of the humans.

Conlusion

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Elephants can communicate over long distances by producing a sub-sonic rumble that can travel over the ground faster than sound through air. Other elephants receive the messages through the sensitive skin on their feet and trunks. It is believed that this is how potential mates and social groups communicate.

As an Asian elephant, Sri Lankan elephants have been very important to culture for more than thousands of years, and they have been domesticated and are used for religious festivals, transportation and to move heavy objects. Therefore, the study on behavioual characteristics of the Sri Lankan elephants are very significant, and as a threathen animal it highly need to pay attention on protection and keeping the elephants' habitats lively.

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