Journal of Biodiversity & Endangered Species

Muthukumarana., J Biodivers Endanger Species
2019, 7:1
DOI: 10.4172/2332-2543.1000226

Review Article Open Access

Significance on African Baby Elephants' Mock Charge Cues towards Tourists Vehicles in Contrast to Asian Elephants

Tharindu Muthukumarana*

Faculty of Freelance Researcher on Elephants, Sri Lanka

***Corresponding author:** Muthukumarana T, *Faculty of* Freelance Researcher on Elephants, Sri Lanka, Tel: 0710820178; E-mail: tharinduele@gmail.com

Received date: Nov 15, 2018, **Accepted date:** Nov 26, 2018, **Published date:** Dec 20, 2018

Abstract

This paper speaks about the uniqueness on African baby elephant's mock charge towards tourists' vehicles. The particular behavior is recognized to be much frequent in African infants or juveniles compared to Asian counterparts. Following research had been composed by observation of Youtube footages uploaded by various individuals. Corresponding to that, there seems to be a high tendency, particularly in the Southern African baby elephants. The aforesaid behavior is just a linkage of the playing behavior of young elephants. The hypothesis proposition suggests that this can be a result of anthropogenic disturbance due to the conspicuous amount of culling and translocation.

Keywords: Mock charge; African and Asian elephants; Vocal sounds

Introduction

Mock charge cue can be common on both African and Asian elephants; including in both the sexes. Elephants tend to mock charge to display threat gesture and are highly involved in the defensive behavior of the animal. In contrary to "mock charge" would be "real charge" in which the animal would be interested in attacking the intruder. Since mock charge is a warning sign, the visual cues play a vital role. Mock charges usually show the signs of agitation. Visual cues may include strenuous ear-flapping, twiddling of the trunk, vocal sounds (may include trumpet), swinging of one of the forelegs to and fro, rocking from side to side, kicking dust, tail raising and etc. An agitated elephant may run a few paces towards and then away from the intruder, making trumpeting sounds, in an attempt to scare the intruder. If this fails it may launch a more serious attack-a mock charge culminating in an impressive display within a short distance from the intruder [1]. In comparison, a real charge may be silent and less pre-strenuous cues. In other words, they "get into to the work quickly". Group or herd charge is done by the entire family group. This behavior is most often observed as an anti-predation display [2].

In this paper, the research is a target on mock charge done by infant and juvenile elephants towards tourists' vehicles. Through the research, it was identified the majority of such incidents happened with African elephants. Also, the majority of them originated from Southern Africa. In the majority of these cases, the rest of the herd seems to be relaxed and doesn't much care what the young mock charger dose. These young mock charges are associated with playing. Since when danger is expected, usually the oldest and strongest members face the potential danger while the vulnerable neonates and infants stand behind them protected and kept in line by juvenile and sub-adult helpers at the rear. This formation is sometimes referred to as "hedgehog formation" [3]. If not in this particular formation the herd might flee from that area. Always the youngsters are at the center of protection.

But this may also differ if the baby elephant has to protect itself by his or her own. As for an example, when a baby elephant falls down to a well in a village and when the baby gets rescued by the locals, the baby might tend to charge the locals (this type of incident can be common in Asian countries). There are numerous incidents when the rescue-teams rush to rescue an abandoned baby elephant, the baby might charge towards rescuers by making their ears flared.

Playing is highly important to young elephants since it is a preparation for adulthood. Something unique cue of young mock chargers was that "rearing" (Upright jump on hind legs). Adult elephants usually stand on their hind legs to reach a high branch or any other food and for mating as for bull elephants. Animals from Family Equidae may perform rearing as for emotions of aggression, excitement, disobedience or pain. Then again species from Family Ursidae (bears) stand on their hind-legs for better vision, olfaction, feeding, threat detection, etc. As for these young elephants, it seems any of the mentioned is not the case.

Young elephants also do have a habit of chasing other animals such as birds (most commonly), Artiodactyla species (eg: antelopes, warthogs, rarely buffalos, etc). There are no common records of baby elephants mock charging predators such as lions (*Panthera leo*), tigers (*Panthera tigris*), leopards (*Panthera pardus*), cheetahs (*Acinonyx jubatus*), wild dogs (*Lycaon pictus*), etc. Mentions a story of an orphan male baby elephant named Juma that enjoyed teasing a lion inside a cage. Juma would rush up to the cage with his ears out and head up, enjoying the inevitable reaction. The lion would crouch as though preparing to spring, and when it launched itself at the wire with a loud growl, Juma would hurriedly reverse and tear off in the opposite direction, trailed by Bibi (a baby orphan female elephant) who was not quite as bold, more easily daunted by their noisy neighbor. In further Sheldrick remarks that Juma needed some surgical attention because his trunk got bitten by the lion.

Researchers such as Dr. Joyce Poole had intimate events of wild elephants approaching the research vehicle and even try to play. Now, this is due to those elephants' familiarity with the research vehicle and may not be the same with every tourist vehicle [4].

Evaluation

It seems that the baby elephant mock charge is frequent in African elephants more than the Asian elephant, so one goal was to identify

from which region the footage originated by using social media networks. In this study, the main focus was on the Youtube website which is credited as the 2nd most visited website in the world by Alexa Internet, Inc. commercial web traffic data and analytics. The first ranked was occupied by Google [1]. According to online statistics-market research and business intelligence portal "Statista" in the year 2017, there have been one billion five hundred million (1,500,000,000) active user accounts on Youtube only. That is 19.7 % of the global population (7.6 billion) [5].

In further, it is essential to identify some difference in the cues of the baby elephant mock charge compared with the adult elephant mock charge cues. Also, some theoretical hypothesis is also put forward for discussion.

Analytical study on footages

Throughout the research about 125 (n=125), video footages were cautiously observed. Each one of the footages has a variable time length. Those videos last form lowest duration of "five seconds" to highest "thirty- six minutes and seventeen seconds" (0:05<36:17). Also to mention both the highest and lowest ones are from South Africa. The combination of all footages gives a value of "four hours, thirty-eight minutes and eleven seconds" (4: 38: 11). In the datasheet the oldest footage published dates back to Jun 28, 2007, and the latest one dates to April 27, 2018, respectively. The oldest one is from South Luangwa NP, Zambia and the most recent one is from Sabi Sands Game Reserve, South Africa.

The Proboscidean species observed in all footages are identified as African bush elephants (*Loxodonta africana* Blumenbach; 1797) and Indian elephant (*Elephas maximus indicus* Cuvier; 1798) only. According to the datasheet, about 98.4% (n= 123) of the footages contains *L. africana*. On another hand, about 1.6% (n=2) features *E.m. indicus*. One of the footages of the Indian elephant originated from Tadoba Tiger Reserve which is located in Chandrapur district of Maharashtra state (western region) in India. The other one originated from Wayanad Wildlife Sanctuary which is located in Wayanad district, in the north-east of Kerala state, Southern India.

Whilst footages of African elephant originated as follows

Kruger N.P (including Game Reserves such as Timbavati, Klaserie, Balule, Kapama, Sabi Sands, etc.), Madikwe Game Reserve (South Africa), Tarangire N.P (Tanzania), Maasai Mara N.P (Southwestern Kenya), Mana Pools N.P (North Zimbabwe), Shamwari Game Reserve (South Africa), Chobe N.P (Northern Botswana), Serengeti N.P (Northern Tanzania), Pilanesberg Game Reserve (South Africa), Addo Elephant N.P (South Africa), Kariega Game Reserve (Eastern Cape South Africa), Ol Pejeta Conservancy (Central Kenya), Welgevonden Game Reserve (South Africa), South Luangwa National Park and Hwange N.P (Zimbabwe).

Out of those, there are some that borders or contiguous with other countries. Such as:

Madikwe G.R (Bordering Botswana)

Maasai Mara NP (in Kenya contiguous with the Serengeti in Tanzania)

Mana Pools (Bordering Zambia)

Chobe N.P (Bordering Zambia, Zimbabwe, and Nambia)

Serengeti N.P (Bordering Kenya)

Hwange N.P (Bordering Botswana)

However, according to the datasheet about 12% (n=15) footages didn't record a venue since the publisher haven't mentioned. Yet all of those unknown footages feature *L. africana* (Figure 1).

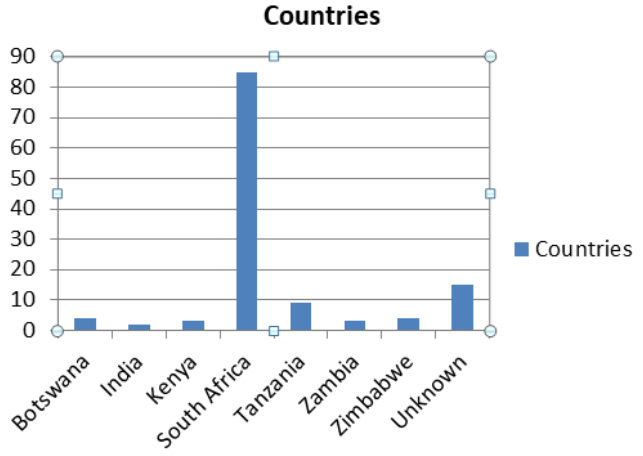

Figure 1: Majority of footages are from South Africa and gives a value of 68% (n=85). The other countries have respective values as: Botswana 3.2% (n=4), India 1.6% (n=2), Kenya 2.4% (n=3), Tanzania 7.2% (n=9), Zambia 2.4% (n=3), Zimbabwe 3.2% (n=4) and unknown 12% (n=15).

Analytic on mock visual cues

In elephants normally, a mock charge can have a lot of body performance. So in the research process, some mock cues that were significant in adult elephants were compared with the young elephants. Such as:

Strenuous ear-flapping, twiddling of the trunk, vocal sounds, swing of one of fore-limbs to and fro, rocking from side to side, kicking dust, tail raising, head toss/head shakes, dusting, head held high, ears spread flat, Bush-bashing, catching the sent by stretching forward/forward trunk swing, inserting the trunk in another one's mouth for reassurance, throwing an object, snort, bending fore-limbs and pronounced–bowhead. In addition to those mentioned, few mock-cues unique for young elephants were also studied such as

Rearing, charging and running back towards mother briskly and mother showing some concern about offspring's behavior. Also in addition, "temporal gland secretion" was also noted. Temporal gland secretion was divided into two categories and they are "slight temporal gland stain" (a small amount of secretion just visible as a stain dot. Also can be the result of a previous day's secretion) and significant oozing of temporin. It is important to mention that in African elephants both male and female, temporal glands can get activated (represented by drainage) when they are excited, apprehension, aggression, stressed and musth (in male). African elephant-calves' temporal secretion begins when they are six-months-old (including both sexes). But in males when they reach adulthood the secretion becomes less frequent and most of the time secretion happens during musth period. In Asian elephants generally, temporal gland activates

during musth in male elephants but on very rare occasions there is notable activation in some females.

However, the mock cue "twiddling of the trunk" (or any movement of the trunk) was not delineated because it was so frequent. Also, most of the elephants featured on the videos are below five years, which as a result of those infants yet haven't mastered their trunk as the adult elephants.

The average value of the mock cues is 30 (excluding temporal gland secretion). Mock cues higher than the average amount include vocal sounds, tail raising, head toss/head shakes, head held high, ears spread flat, catching the sent by stretching forward/forward trunk swing, (within the average level) charging and running back towards mother briskly and pronounced–bow-head. It is consequential to note that, except charging and running back… every other "above average cues" are performed by adult elephants. Incompatibly, the mock charge unique for infant elephants "rearing" has a value of below average.

According to the research, most common mock cues were:

(1) Ears spread flat (n=123 (98.4 %)

(2) Head held high (n=121 (96.8 %)

(3) Tail raising (n=106 (84.8 %)

It is important to note that (1) and (2) are more frequent than (3). The reason can be probable since both (1) and (2) are associated with the face of the animal. On account of it, the face is known as the central body region of senses and animals are known to use it on expressions of emotions. In the research, every video had some linkage with the face.

Strenuous ear-flapping wasn't shown in any of the footages. The reason can be since there wasn't any agitation showed in the footages. Absent of "strenuous ear-flapping can once again prove that this baby elephant behavior is linked with play activity. It is also important to note that when Asian elephants get agitated they tend to flap their ears more vigorously than the African elephant. This is because morphologically the African elephant's ear is more efficient as air trappers and Asian elephant's ear is efficient as air grabbers [6]. But be that as it may, the strenuous elephant flapping rhythm for an African elephant wasn't shown in this research.

Another behavior that was delineated but didn't show any values was "inserting the trunk in another one's mouth for reassurance". Now this behavior can be common in adult elephants especially in herds members. In certain occasions when herds perform "mock behavior" towards the intruder, adult members can be seen inserting their trunks into each other's mouths for reassurance. But then again it is also a behavior that is more common in Asian elephants than the African elephants. Mainly the African elephants sniff another's temporal gland for reassurance and for greeting. Sententious temporin secretion in African species may be one reason behind that. Yet mother elephants might insert their trunk into infant's mouth for reassurance. Even so, baby elephants may insert their trunk into adult's mouth to get knowledge about food.

When it comes to temporal gland secretion majority of them were slight temporal gland stains (17.59%). Contrarily the "Significant oozing of temporin" was only recorded in one footage only (0.8%). That footage originated from Kariega Game Reserve, South Africa. But in that footage, the other members of the herd seem to be anxious for some unknown reason. Also, there were two juvenile elephants testing their strength.

"Mother showing some concern about offspring's behavior" had a value of 12% (n=15) and was below the average amount. This further proves that these young chargers had been associating with play. If it was a typical genuine danger, adult elephants would be the mock-actors or the herd might flee from that site (Table 1).

Mock cues	% value	n
Vocal Sounds	30.40%	38
Swing of one of fore-legs to and fro	9.60%	12
Rocking from side to side	6.40%	8
Kicking dust	4.00%	5
Tail raising	84.80%	106
Head toss/Head shakes	27.20%	34
Dusting	0.80%	1
Head held high	96.80%	121
Bush-bashing	8.00%	10
Ears spread flat	98.40%	123
Catching the sent by stretching forward/forward trunk swing	24.00%	30
Inserting the trunk in another one's mouth for reassurance	0	0
Throwing an object	2.40%	3
snort	3.20%	4
Bending of fore-limbs	7.20%	9
Pronounced–bow-head	27.20%	34
Strenuous ear-flapping	0	0
Rearing	10.40%	13
Charging and running back towards mother briskly	27.20%	34
Mother showing some concern about offspring's behavior	12.00%	15
Slight temporal gland stain	17.59%	22
Significant oozing of temporin	0.80%	1

Table 1: Mock cues with the values.

Publishers and Views

The footages in the datasheet may not all be from the original publishers. Some of them may be from second-hand publishers as well (like downloading the video and uploading it form a different channel). The least number of views of footage recorded 10 views and it draws back to the year 2015. In contradistinction, the highest number of views was 1,419,277 and from the year 2012 (Figures 2 and 3).

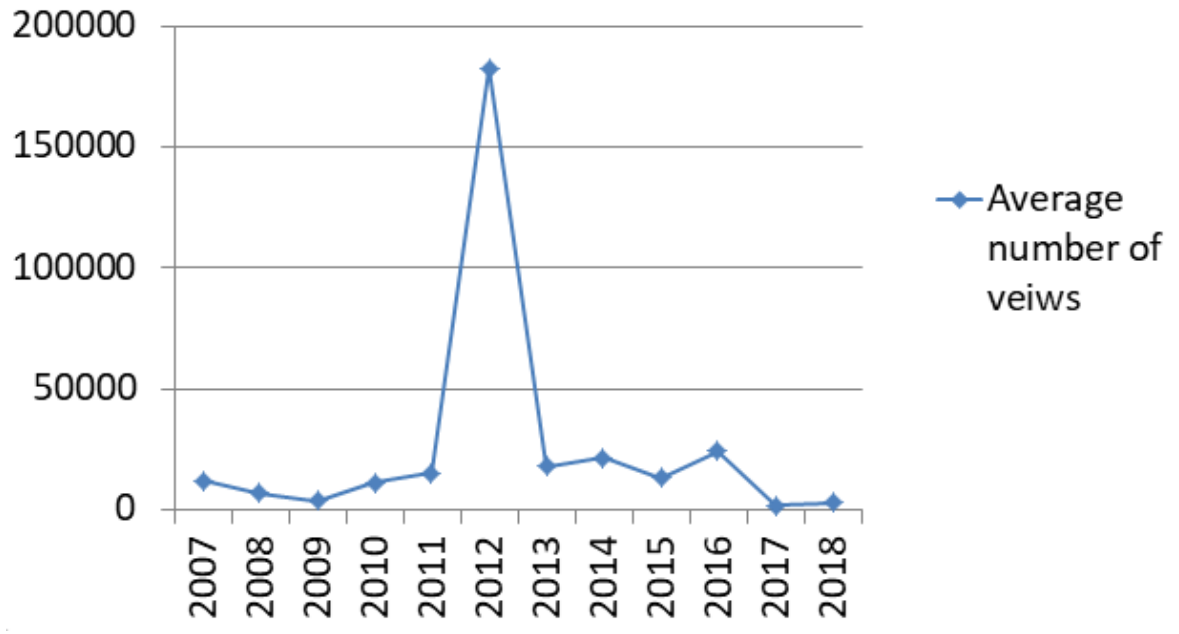

Figure 2: Average numbers of views per year. In 2018 the values were obtained within a time of half year.

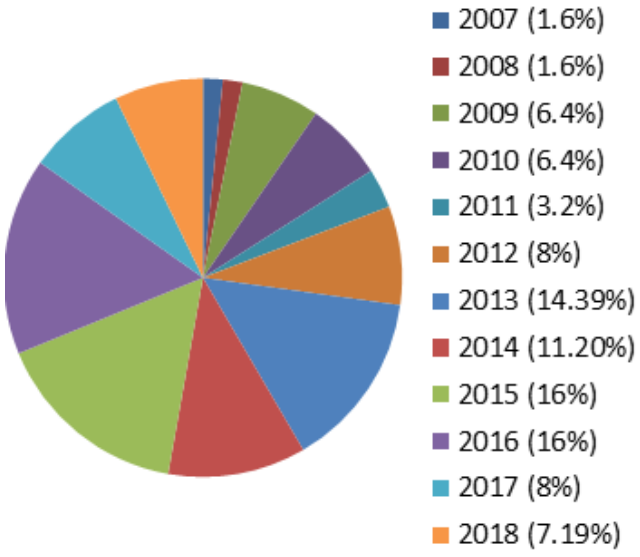

Figure 3: Number of footages published relative to the year. Once again in 2018, the values were obtained within a time of half a year.

Discussion

Few literature records

There are only few literature records of baby elephant mock charge. In here I am sharing two of such records: In Dr. Iain Douglas-Hamilton's memoir, he mentions an incident that he witnessed during his stay at Lake Manyara, Tanzania for his doctoral studies. He talks about a year old male baby elephant named N'Dume:

When he was very young he once rushed right up to my Land-Rover and threatened it with his little ears wide apart, head raised and piggy eyes squinting aggressively. He was not in time least afraid until he noticed he was alone. "Slender tusks", watching his performance some twenty paces back, twirled her trunk anxiously. Then suddenly he lost heart and rushed back to his mother's side, with his tail in the air, squealing [4].

Hamilton further mentions an illustration is a way in which N'Dume in his first year learned to fear my Land Rower by imitating his mother's response, which was one of circumspection. His first aggressive rush up to the wheel of the vehicle was never repeated.

In Hamilton's record, it is important to note that (1) his charge was a rare kind of behavior that he had noticed. (2) It was the first and last time it was performed. (3) N'Dume's mother was concern about the infants' behavior.

In Sri Lanka, there was one record of a baby elephant charge in Wasgamuwa N.P. Although there are no scientific data available this N.P is famous for aggressive elephants. This record is from an article published in Loris Journal by Mr. C.D harmasena. He explains that when encountered a young mother with a one-foot tall baby; the mother proudly watched while the offspring boldly charged us, trumpeting and blowing dust in a realistic display of arrogance. He also mentions on every trip to Wasgamuwa since the early 1980s, it has been my experience that many elephants are rather boisterous and tend to charge on sight [3].

However, according to modern day observation, Wasgamuwa is not famous for baby elephant charges and story mentioned may be a rare occurrence.

Hypothesis Proposition

Now the most important keynotes on this research are

Although the infant's charge is similar to the adult-mock charge yet the infant behavior is associated with "play". Also, infant elephant mock cues were similar to adult elephants' mock cues. There is a high tendency in baby elephant mock charge at Africa, especially in South Africa. Other members of the herd seem to be less concern about the young mock charger.

Out of them, There is a high tendency in baby elephant mock charge at Africa, especially South Africa is the most unique finding. The exact reason for this would be hard to ratify. But nevertheless, some hypothesis can be put forward.

One of the hypothesis can be linked to the aggression shown by adults and young generations learning them over the time. Elephants are born precocial but they need to learn a lot during their young age. The size of the brain at birth relative to adult brain size indicates how much an animal needs to learn and the reflection of their intelligence. Most mammals are born with a brain close to 90% of the adult weight. Humans have 28% and elephants have 35% (Poole; 1956). So they need to learn from studying and imitating adults.

South Africa had been actively involved in elephant culling and translocation operations, in which both of them can be end-resulted in an aggressive population of elephants. In fact, South Africa was the first African country that initiated translocation of elephants for management and re-introduction purposes in the 1970s. Private landowners in South Africa became interested in elephant translocation as a way of enhancing the tourism potential of their properties. Consequently, the sales of elephants to private reserves increased tremendously and by 1994, 1,339 juvenile elephants had been translocated out of Kruger N.P to other conservation areas [7].

South Africa has a persistent history of culling elephants, primarily in Kruger National Park, where most of the country's elephants are found [8]. By the mids of the 19th-century elephants were almost extinct in South Africa due to the shooting of elephants.

It is also known that some Boers became professional elephant hunters with the result that the virtual extinction of elephants in South Africa was accelerated [4]. In 1989, when Lowveld areas of South Africa was proclaimed as Kruger National Park, only twelve elephants roamed within the park. Kruger's first warden, James Stevenson-Hamilton (1903) reports that there were no elephants to be found. But they responded quickly to the new sanctuary and by 1905 his staff had found evidence of their occurrence near the confluence of the Letaba and Olifants rivers which is located roughly midway between the Park's northern and southern boundaries [9,10].

By mid-1960s South Africa implemented culling. The aim of the administration was to keep the elephant population at 7,000 individuals (density to 0:32 elephants/km^2) with accepted fluctuations between 6,000 and 8,500 individuals in the 20,000 km^2 park.

To meet these objectives, an organized culling program has been in operation since 1967; this program removed about 17,200 elephants during 1967-1996, an annual average of 6.7% of Kruger National Park's elephant population estimated through aerial counts. In South Africa's bordering country, Zimbabwe had known cull about a minimum of 46,775 elephants during 1960-1991 (Table 2).

Location	Culled amount	Years
Kenya/Tsavo N.P	300	1966
Tanzania/Mkomazi Game Reserve (east and Central)		1968-1969
Uganda/Murchison Falls N.P	2,000	1965-1967
Zambia/Luangwa Valley	1,500	1965-1969
Zimbabwe/Widespread across elephant range*	minimum of 46,775	1960-1991
Namibia/Etosha N.P	570	1983-1985
South Africa/Primary in Kruger N.P	17,200	1967-1996

Table 2: Countries that implemented culling, with the years and the numbers, according to Sukumar (2003). The "culled amount" in Zimbabwe is an assumption value by Dr. Rowan Martin.

Some of the famous unusual elephant behavior recorded in South Africa previously due to culling and translocation

In the late 20th century, a project was undertaken to release some young orphan elephants to the Pilanesberg Reserve. These sub-adult elephants were orphans due to a culling operation at Kruger. By that time the reserve was very young and did not have any mature bull elephant population. As a result, those males introduced as orphans came into musth at a younger age than normal and stayed in musth for longer periods than usual. Even more unusual, these elephants started attacking white rhinos (Ceratotherium simum) and black rhinos (Diceros bicornis). They also showed aggression towards tourists' vehicles. All together it included 40 dead rhinos and one human fatality. As a solution, six matured bull elephants were introduced from Kruger N.P. Afterward, the matured bulls asserted their dominance and the young orphans realize their hierarchy. In the end, such aggressive behavior wasn't ever repeated [9].

In research at Addo Elephant N.P showed that 90% of male elephant deaths are caused by bull elephant conflicts, in contrast with just 6 percent in more stable elephant communities. Besides in May of 2010, a younger male who had been translocated from Kruger N.P killed a non-aggressive older male, also translocated from Kruger.

A science paper published in the year 2013 revealed that past culling operations had greatly disrupted the social behavior of modern elephants. The research was evaluated and implemented by playing elephant-calls to two different populations. One of them included the population from South Africa's Pilanesberg N.P and the others were from Amboseli N.P. The results showed that Southern African elephants performed poorly on systematic tests of their social knowledge, failing to distinguish between callers on the basis of social familiarity. Moreover, those elephant population showed no evidence of discriminating between callers when age-related cues simulated individuals on an increasing scale of social dominance, in sharp contrast to the Amboseli population where the core social ability was well developed. When Amboseli population presented with the playback call the herd immediately reacted with a defensive response and bunching together as they moved towards the sound [11-18].

Conclusion

Although the research suggests that these young mock-chargers are a result of the aftermath of culling and translocation, yet the population dynamics seems to be recovering from the horrendous past. As because the entire herd members doesn't seem agitated or intimidate in presence of tourist vehicles. There may be exceptions but in here it is general. Due to anthropogenic disturbance, natural selection would have made succeeding generations to have a high tendency of "mock charging play".

References

1. Alexa Internet Archived (2018) Alexa Top 500 Global Sites.
2. Lisa Kemmerer (2015) Essential elements for elephants. animals and the environment: Advocacy, activism, and the quest for common ground. Taylor and Francis Group
3. Dharmasena C (2017) Wasgamuwa Revisited. In: Saga of the Elephant in Sri Lanka (Part III) Extracts from Loris.
4. Hamilton ID, Hamilton OD (1975) Among the elephants. Collins and Harvill Press.
5. Statista (2017) Global social media ranking-Statistic.
6. Muthukumarana T (2017) The life of last proboscideans: Elephants.
7. Dublin, Holly T, Niskanen LS (2003) Guidelines for the in situ translocation of the African Elephant for conservation Purposes. IUCN.
8. Sukumar R (2003) The living elephants: Evolutionary ecology, behavior and conservation. Oxford University Press 478.
9. Slotow R, Van DG (2000) Role of delinquent young "orphan" male elephants in high mortality of white rhinoceros in Pilanesberg National Park, South Africa. Koedoe 44: 85-94.
10. Whyte IJ (2001) Headaches and heartaches-the elephant management dilemma. In: Environmental Ethics Introductory. Oxford University Press 15: 293-305.
11. Graeme S, Rob S, Sarah MD, Katito NS, Joyce P (2013) Effects of social disruption in elephants persist decades after culling. Frontiers in Zoology 10: 218-228.
12. Fred K, Garai ME (2007) The Sri Lankan Elephant in captivity. Vijitha Yapa Publications.
13. Moss C (1989) Elephant memories: Thirteen years in the life of an elephant family. Biological Sciences.
14. Moss CJ, Croze H, Lee PC (2011) The amboseli Elephants: A long-term perspective on a long-lived mammal.
15. Pincott, Sharon (2016) Elephant dawn the inspirational story of thirteen years living with elephants in the African Wilderness Conservationist, Naturalist.
16. Plotnik JM, De Waal FBM (2014) Asian elephants (Elephas maximus) reassure others in distress. Peer J.
17. Poole Joyce (1956) Coming of age with elephants: A Memoir.
18. Sukumar R, Schaller GB (1994) Elephant days and nights ten years with the Indian Elephant. Biological Sciences.