International Journal of Scientific Research in Biological Sciences

Review Paper

Vol.7, Issue.1, pp.131-136, February (2020)

E-ISSN: 2347-7520

A Review on Distribution, Behavior, Population Status, And Conservation Issues of Menelik's Bush Buck (*Tragelaphus Scriptus Menelk*)

Rabira Gonfa

Department of Biology, Fitche College of Teachers Education, Ethiopia

Author's Mail id: rabira.gonfa@yahoo.com

Available online at: www.isroset.org

Received: 03/Jan/2019, Accepted: 20/Jan/2020, Online: 28/Feb/2020

Abstract- Menelk bush buck (Tragelaphus scriptus Menelk) is medium-sized herbivores. Their population number is confined to a few groups into sub-areas with criteria such as their good relationships and isolation. Anthropogenic disturbance and its impacts on biodiversity pose urgent challenges to biologists as we emphasized throughout this review. The main objective of this work is to review the distribution, behavior, Population status, and conservation issues of Menelk's bush buck (Tragelaphus scriptus Menelk). Causes of decrease in numbers seem to be related to the restricted habitat availability due to changes in human agro-pastoral activities, which resulted mainly in reduced day-cover availability and possibly reduced food base. This review concludes the basic aspects of Menelk bush buck distribution, ecology, nutritional habits and evaluates the main threats and destruction of Menelk bush buck management. Menelk bush buck seem to do well in moderately modified agro-systems with non- invasive human activities.

Keywords: Conservation Distribution, Behavior, Minilik bush buck, Population

I. INTRODUCTION

The altitudinal variation within Ethiopia produces a range of climatic differences which affect the distribution of fauna and flora [1]. The main areas of wild life concentrations of Ethiopia are the south western half of Ethiopia, the Gambella region and Eastern half of Ethiopia. In addition to that Ethiopia is fortunate in possessing diverse faunal diversity and significant number of endemic species. One of these endemic mammal species of Ethiopia is the Menelik's bush buck [2]. Menelik's bush buck is confined to the high land Forest of Bale Mountain and other high land areas. Minilik Bushbucks are forest-edge antelopes. They live in habitat including rain forests, montane forests, forest-savanna mosaics and bush savannas [3].

The Menelk's Bushbuck is named after Emperor Menelik II (1844-1913) of Ethiopia. But it is also called as the Arussi bushbuck or black bushbuck. The Menelk's Bushbuck (*Tragelaphus scriptus)* is the antelope family. It has several characteristics that distinguish it from the other Bush bucks. Menelk's bushbuck is resembled in physical appearance to the mountain races of the East African bushbuck especially in Kenya and the Cape bushbuck in South Africa. It is a very attractive, medium-sized with a rather long coat of very dark brown (sometimes almost black) hair. Usually, there are opposing white spots on throat, base of neck and inside of legs, and a few white spots on the thighs [4].

Menelk's Bushbuck is a small to medium antelope which belongs to an antelope, family- Bovidae, Genus –Tregalap-hus, Species, -scriptus and Subspecies, -scriptus Menelk . The color of the coat can vary from red-brown, dark olive to almost black, depending on the habitat of that particular Bushbuck. Most Bushbucks also sport unusual white striping and splotching on their sides, as well as white patches on legs, ears, throat and tail. These white splotches and stripes help individual members identify one another and also act as a warning signal when danger is near. The white markings on some populations are more pronounced than on others, depending on genetics and habitat**.**

Objectives of the seminar

General objective

To review over all features of Menelk's bush buck**.**

Specific objectives

To identify the distribution of Menelk's bush buck.

To know the social, feeding and reproductive behavior of Menelk's bush buck.

To assess population status of Menelk's bush buck.
To assess conservation issues of Menelk's bush buck.

II. RELATED WORK

The distribution and abundance of large mammals are determined by abiotic and biotic factors of the environment. The influences of physical features of an area (topography) on the fauna are often indirect, as the all-important climatic and ecological environment and superimposed upon it. Environmental influence has molded the distribution patterns of mammals within the area and on the continent as a whole Vegetation provides food, shelter and cover to mammals The structure and composition of vegetation, therefore, determine the distribution, abundance, and diversity of mammalian community residing in it[5]. A reciprocal relationship is also reported to exist between mammalian community type and plant structure dynamics.In general, the more diverse the habitat, the higher is the mammalian fauna. From the above studies it is seen that the better the habitat, the better is immigration, survival, abundance, recruitment, length of breeding season and body weight
The current studies focus on A review on distribution, behavior, Population status, and conservation issues of Menelik's bush buck (*Tragelaphus scriptus Menelk*)

III. METHODOLOGY

In preparation of this review Paper, the necessary information or data are gathered from different related literature of journals, books, edited books, MSc. Thesis and PhD Dissertations.

IV. LITERATURE REVIEW

Distribution, Behavior, Population status and conservation issues of Menelk's bush buck (*Tragelaphus scriptus Menelk*)

Distribution of Menelik's bush buck

Menelk's Bushbuck is a forest-dwelling antelope. The distribution of mammals in all habitat types indicates their adaptation to a variety of habitat types [5]. Menelik's bush buck makes its home in a wide range of forest types. Rainforests, savanna-forest mosaics, light woodlands, and savanna bush forests are amongst its favorite habitats. The family of Menelk's bush buck happens usually in Africa where there is shelter to hide it, from tropical rain forest edge to spots of corridor forest and savanna near water in the sub desert. It is obviously absent from dry and semi-arid regions and from extensive areas of closed-canopy forest. Its ability to survive in human-dominated sites and to resist heavy pursuing pressure has enabled it to continue over much of its former range [6].

It covers temperately thick vegetation (swamplands and open savanna), where both diet and shelter are available, more often than the reverie forests. They are always seen in pairs or small family parties of female and young. This animal is extremely beautiful little animals, with coat longer than that of other Bush bucks, because of living in the lower temperatures of high altitudes. The marsh, however, appeared to be preferred over both reverie and open savanna. Menelik's Bush buck use different plant species, ranging from climbers to trees, as shelter at resting sites. Choosing night resting sites close to human habitation also reduces the risk of predation, because most of the large predators did not come close to such areas. Using sites with trees/shrubs having less than 20 cm in close proximity probably gave the bushbucks a better view of their surroundings, and thus, a better chance of spotting approach in danger

Behavior of Menelik's bush buck

Social Behavior of Menelik's bush buck

Menelk Bush buck are most of the time, semi-solitary animals that means occur either singly, in pairs, or in small groups consisting of one leading mature ram, 2-3 adult and 1-2 sub-adult youngsters [7]. The leading ram stays with a family group all through the year. Families' connections of Menelk's bush buck are weak and individuals continuously argument between next to groups. Groups regularly avoid each other where home ranges overlap but for a very short period of time it may occur on communal feeding grounds. Sub-adult rams are solitary and keep to the fringes of family groups [8].

From the three male age classes (territorial males, young-adult bachelors and sub-adult males) adult, the territorial males have a tendency to make object-horning knowingly more often than the followers of the other two age groups. An analysis of whether territorial males perform object-horning more often in the presence of another individual, that would suggest object-horning act as a visual display, revealed that object-horning bush buck is predominantly performed when males are solitary[9]

Menelk Bush buck make the patterns more visible throughout highly ritualized displays which playful their backs and gait in a nervous, high-stepping gait. These displays, used for influencing and threatening females and opposing males, usually make struggling unnecessary. The chain of command between males is age-based; as they get older and the anecdote color changes to dark brown, the white patterns are more visible. The color of bush buck varies depending on geographic location [10].

Menelk's bush buck belonging to the same family as the Mountain Nyala, the Kudu, the Bongo and the Eland, shares with them the family characteristic of shy and elusive behavior. These antelopes have small home ranges, which may overlap with those of other bushbuck. Even though there still is not much interaction as adult individuals choose to break by themselves in their separate areas. Mature males usually go out of their way to avoid contact with each other [11].
Menelk's bush buck commonly active during early morning and part of the night, bushbucks become almost entirely nocturnal in areas where they are apt to be disturbed frequently during the day. When worried, individuals respond in different ways. If they are in woodland or thick bush, they may "embargo" in one situation and persist very still, their coloring masking them. Sometimes they will bowl to the ground and lie horizontal, or they may fix away, building a sequence of hoarse woofs. When astonished in the open, they occasionally stand still or slowly walk to the adjacent dense area. Most Bush buck species be disposed to devote the heat of the day lying up in dense bush where there is no hope of spotting them [12].

The highland forest Menelk's bushbuck exists, is comparatively cool and you can get them (if you are in luck) at any time of day. It is more usual however, to spot them from about four o'clock onwards, or in the early morning. They have a loud woofing alarm call, sometimes repeated, which can be heard from some distance away, and also a series of grunts.

Feeding behavior of Menelk's bush buck
Menelk's Bushbucks need some water. They are herbivores that means they gets its energy from eating plants . Menelk's bush buck devoted more time to feeding than any other activity during both wet and dry seasons. They are also highly selective, concentrate feeder browsing predominantly on dicot shrubs and small trees. It selects both plant species and plant specific material, especially young growth from actively growing shoot ends. Most of the time they avoids eating mature leaves from the sides of older branches but rather taste off the entire shoot tip [13].The diet this angulate animal includes flowers, fruit, berries, mushrooms, fungi and succulent roots dug out with the front feet. If available, small portions of the green leaves of medium height, sweet grasses are browsed throughout the year. Utilization of habitat is often determined by the availability of cover and food and rich plant growth.Quality and quantity of Menelk bush buck foods varies between habitat and seasons. During dry seasons the declining nutritional value of the diet, usually results in major bushbuck mortalities. As the rainy season restarted, they expanded their acceptance range to include a considerable amount of herbs species. This adaptive feeding style most probably contributed to the pronounced seasonality in foraging behavior. This corresponds with the bushbuck's ability to utilize a wide range of plant species [14]. They exhibited a similar strategy by concentrating feeding on the available shrub species during the dry season.

The proportion of food taken from shrubs in wet season increased while the amount of herbs decreased. In the dry season, on the opposing, the transitions are less distinct because of an increased percentage of the erect Indigofera spp. As bushbuck are concentrate selectors which prefer to eat highly nutritious plant species .they incorporate considerable amounts of grass into their diet only if the plant is of high nutrient content, easily available and with little competition from grazers. Commonly when feeding on forbs and browse, bite decrease and bite size increases as biomass or leaf surface area increases.

Food consumed by the Menelk's bush buck is diverse. The study conducted by [15] showed that about 71 plant species belonging to 27 families are consumed. Among these, 46 species are observed during feeding records the remaining 25 species are only seen to be consumed outside feeding records, and out of these species of plants, more than 75% are perennial woody herbs, annual non-woody herbs and shrubs and the rest are trees and lianas. The highest contribution of diet is from the family *Poaceae* (15.2%), Acanthaceae (10.9%), *Fabaceae* and *Rosaceae* (8.7%, each). Accordingly, these four plant families contributed about 43.5% of the total diet of the animals. The habitat type, life forms, parts consumed, time spent and the food items consumed are indicated (Table 1). The eight most consumed plants accounted over 81% of the overall diet of Menelk's bush buck. Based on the overall percentage contribution, *Hypoestes forskaolli* are the most consumed plant species which accounted for 49%.

Reproductive behavior of Menelk's bush buck
The gestation age of Menelk's bush buck is about 6 to 7 months. This means that they are able to reproduce twice a year in some areas. After giving birth, the mother cleans the newborn calf and eats the placenta. She leaves the calf well hidden. When she visits and suckles it, she eats its dung so no scent leftovers to attract hunters. The calf does not follow its mother out into the open to forage till it is four months old. It remainders hidden in the dense underbrush in the meantime and its

mother returns intermittently to let it nurse. The young calf is always closely pressed on the side of an adult, in front of the adult or under the body of an adult.

Sexual maturity is reached at one year, but males' horns do not reach full size until three years of age. Reproducing chances do indeed occur continuously, thereby, letting males to repeatedly mate with quite a lot of females. Territorial males have, therefore, relatively unhindered chances to mate with interested females present in their own territory. In species with a highly competitive mating system, age may determine whether a male will be a territory holder and thereby have more access to females, or use alternative, non-territorial mating behaviors . There are three social/age groups of male menelk bushbuck (*Tragelaphus scriptus*), these are adult territorial males from age of four to five years, young-adult non-territorial males age from three to four years and sub adult males from one to three years. Territorial males are subordinate more frequently with females than sub adult males, but young adult males did not significantly differ from territorial males[16].
In all three classes of males, the spatial scattering of the males relative to that of the females (i.e., their home range overlap) are association between males and females. The inner core of an adult male's home-range is used almost exclusively by this male. Territorial males displayed very high rates of infusing performance when compared with the other two social/age classes and commonly tried to controls females; though, copulation proportions are not significantly differ between adult territorial and young adult non-territorial males. Opposed behavior was most frequently initiated by territorial males when approached by a young-adult male, whereas aggressive Interactions between two territorial males were far less frequent [17].The two age-dependent copulating strategies exist in male bushbuck, that of adult territorial males and a sneak-like method in young-adult males. Even though the great number of mating behaviors exposed by sub adults, territorial males may have benefited over non-territorial males, for the reason that they have more unhindered chances to monitor females via deposited excreta in localized defecation [18].

Population status of Menelk's bush buck

It is difficult to estimate the exact numbers of the total population of Menelk's bush buck in a given area because of their nocturnal and secretive habits [9]. It is usual to spot them from about four o'clock onwards, or in the early morning. They have a loud barking alarm call, like that of domestic dogs, which can be heard from some distance away, and also a series of grunts. Due to this Very few Menelk's Bush bucks have been collected by hunters. The increasing of numbers in the park could lead to its greater approachability to legal hunters. it difficult to estimate its concentration and abundance. The more vegetated areas have the heaviest population of Menelk's Bush buck and it has no significant variation in wet and dry seasons [19]. The seasonal variation of age and sex distribution is significant. And the number of male to female sex ratios unequal [20]. Females Menelk's bush bucks are significant in population. That means they have a potential to increase in number. The plausible variation in sex ratio may be large due to the increased mortality of males [21]. The solitary nature towards forming small groups enhances the vulnerability of males towards predation because males leave their mothers after maturity while females remain to form a mother. The size of Menelk's Bushbuck is usually small, and they found scattered throughout suitable habitat [22].

The ratio of young to other Menelik's bush buck (1:12.50) in the current status may show a declining trend of the animal as a result of low percentage of breeding females or higher percentage of young predation. The most plausible reason may be the young have a tendency to be kept hidden under bushes. Hence, they could have been underestimated during the survey [23]. Moreover, they may be susceptible to predators at this stage as they are unable to escape from the predators.

Threat of Menelik's bush buck

Major Threats Larger Menelk bush buck which constitute the prey population in the savannah grassland ecosystem are among the vulnerable wild species. Swayne"s hartebeest that was formerly distributed throughout open grass and bush lands is one of the most threatened ones. It is now restricted only to very few areas of Ethiopia and thus it is an endemic sub-species to and also listed as endangered .predators, Habitat destruction, render pest and poaching are believed to be the main threat

Predators

Menelk Bushbucks are mostly exposed to predators when on the run, but if confronted the male will fight heroically if attacked, it may become dangerous enemy[24].The main hunter is the leopard, but lions, hyenas, cheetahs, hunting dogs and crocodiles prey on bushbucks too. The undeveloped are also trapped by servals, golden cats, eagles and pythons as well as chimpanzees and baboons. Although baboons sometimes eat the young, bushbucks continue to associate closely with them at times, picking up fallen fruit and other food that for aging baboons drop.

Habitat destruction

From different researcher point of view the main threat to the species come from human activity ; largely in the form of land-use exercises that have occasioned in degraded or loss of habitat over the past century. Much of the mountain forest has been cut and has been replaced by agriculture. Deforestation tends to be incremental. Bushbuck have disappeared from some areas in the drier parts of its former range because of habitat destruction and increasing aridity, but it is expanding its

distribution within the equatorial forest zone as this is opened up by human activities. There do not seem to be any highest threats to its long-term conservation, although numbers of this species may be gradually decreasing locally as hunting pressures increase in parts of its range. Several forest coverings all over the area are dwindling, owing to the repetition of burning grass veldt up to or into the forest [25]. The planting of commercial timber right up to forests, reduce or completely remove forest margins.

Poaching

Menelk's Bushbuck seems to be very exposed to poaching and snaring, or disturbance by uncontrolled dogs. The nature of the bushbuck's habitat offers shelter to clandestine hunting and snaring[26]. There is an evidence of declines in Menelik's bushbuck numbers in some areas where Nyala have been introduced and out-competed the bushbuck.

Disease

Unlike buffaloes and many other mammals, bushbucks do not tolerate oxpeckers or other birds that help to control insect pests. As a result, they often have abundant ticks on their head and neck. Most of Minilik bush buck are died by disease. They also suffer from the common ungulate diseases, including rinderpest, which diminished their numbers .

Conservation issue Menelk's bush of buck

Most Forest area are faced by a number of threats. Of particular importance is the heavy grazing of the under story, the cutting of trees for construction, farm tool and fuel, and the expansion of cultivated areas[27] The Afro-alpine grassland ecosystem is impacted by fire, hunting and illegal grazing. Cattle-grazing with in the forest area has had a profound impact on forest regeneration. The long-term providence of the forest will be dependent on the concentration of this grazing pressure. The Forest and Wildlife Conservation section of the Agriculture Office must monitors the forest and grassland of the area. The local community is allowed to cut the some grasses. It is used in construction (walls and roofing), for rope, baskets, and bedding .Local people are also allowed to gather dead/fallen wood from the forest [28]. The best approach to conservation is through maintainable management that includes economic development and welfares to local communities. Honey is an important non-timber forest product in this area, with farmers signifying that it is the major off-farm source of income; Participatory resource management is being educated to the local community through social meetings and planned target group meeting [29].

V. CONCLUSION

The Altitudinal variation within Ethiopia produces a range of climate which affects the distribution of fauna and flora. Ethiopia is also fortunate in possessing diverse faunal diversity and significant number of endemic species .One of these endemic mammal species of Ethiopia is the Menelk's bush buck. Menelk's bush buck is restricted to the high land areas of most African Forest. The Menelk's Bushbuck (*Tragelaphus scriptus menelk*) is a very unusual specimen of the antelope family. It has several characteristics that distinguish it from the other bush buck species. They are basically solitary mammals. And Belonging to the same family as the Mountain Nyala, the Kudu, the Bongo and the Eland. Menelk's bush buck devoted more time to feeding than any other activity during both wet and dry seasons. They are selective feeder. The gestation period of Menelk's bush buck is 6 to 7 months. Allowing a female to produce more than one calf per year or females are able to reproduce twice a year .The young calf is closely pressed on the side of an adult, in front of the adult or under the body of an adult. It is difficult to estimate the total population of Menelk's bush buck because of their nocturnal and secret behaviors. They are most vulnerable to predators when on the run, but if restricted the male will fight heroically if attacked, it may become dangerous. Menelk Bushbuck have disappeared from some areas due to poaching, habitat destruction predators disease and increasing of aridity

Table 1.List of plant species, parts consumed habitats, life forms and time spent for feeding of Menelk's bush buck.

Local Name	Family	Species	Habitat Types	Life Form	Parts consumed	Time spent (%)
Dergu/Derg	Acanthaceae	*Hyposestes forskaolli* R.Br.	A	3	yl, ml,st,sh,fl	39.7
Atat	Celastraceae	*Maytenus arbutifolia* Wilczek	a,b	1	yl,ml,sh	7.3
Telenj	Acanthaceae	*Asystasia gangetica* Anders.	A	4	yl, ml,st,sh,fl	8.6
Telenj	Amaranthaceae	*Achyranthes aspera* L.	A	4	yl,ml,sh	7.3
Tifie	Oliniaceae	*Olinia rochetiana* Juss.	A	1	yl,sh	6.1
Serdo	Poaceae	*Cynodon dactylon* L.	A	4	yl,ml,st	5.5
Tikur telenj	Acanthaceae	*Barieria ventricosa* Hochst.	A	4	yl,ml,sh	2.4
Maget	Fabaceae	*Trifolium temnense* Fresen	A	4	yl,ml,st,sh,fl	3.3
Chemekot	Fabaceae	*Trifoliumrueppellianum* Fressen	A	4	yl,ml,st,sh,fl	2.2
Engicha	Cyperaceae	*Cyperus rigidifolius* Steud.	a,b	4	yl,ml	3.7
Gaja	Poaceae	*Andropogon gayanus* Kunth	A	4	yl,ml	2.1
Tikur Enchet	Rosaceae	*Prunus africana* Kalkm.	A	1	Yl	0.4
Koshim	Flacourtiaceae	*Dovyalis abyssinica* Warb.	A	2	Yl	0.3

1=tree, 2=shrub, 3=perennial woody herb, 4=annual non-woody herb, 5=lianas/climber; a=forest, b=Erica woodland, c=Festuca grassland; yl=young leaves, ml=mature leaves, st=stem, sh=shoot,fl=flower,fr=Fruit. (Source: [15].

ACKNOWLEDGMENTS

I would like to express my gratitude to my advisor Dr. Tsegaye Gadisa for his guidance and thoughtful suggestions. Last but not least, I am indebted to my parents, friends and classmates for their support and encouragement

REFERENCES

[1] T.Melaku,"Wildlife in Ethiopia: Endemic Large Mammals College of Veterinary Medicine Haramaya University, Ethiopia World" *J Zool* **6**: 108-116, 2011.
[2] T.Wronski,"Home range overlap and spatial organization as indicators for territoriality among male bushbuck (*Tragelaphus scriptus*)*" Afr J Zool Lond*. **266***:1–9.2005*
[3] Y.Dereje, M.Yosef, and B. Afework," Population Ecology of Menelik's Bushbuck (*Tragelaphus scriptusMenelik's*) from Denkoro Forest Proposed National Park, Northern Ethiopia" *Int J Ecol Environ scien***. 37**: 1-13.2011
[4] T.Woldemariam, "The impact of land use/land cover changes on biodiversity in Masha and Anderacha *Woredas* of Sheka Zone, SNNP Regional State. In: *Forests of* Sheka: Multidisciplinary case studies on impacts of land use/land cover changes, southwest Ethiopia (Fetene, M. (Ed.)". MELCA Mahiber, Addis Ababa, Ethiopia. 2007
[5] G.Rabira, G.Tsegaye, and H.Tadese, "The diversity, abundance and habitat association of medium and large sized mammals of Dati Wolel National Park, of Western Ethiopia" 7(**2**):112-118. 2015.
[6] B.Dankwa, and L. Euler, "Bushbuck (*Tragelaphus scriptus* Pallas) habitat in Mole National Park, northern Ghana" *Afr J Ecol*. **40**: 35-41. 2002.
[7] S.Macleod, G.Kerley,and A. Gayland,"Habitat and diet of bushbuck (*Tragelaphus scriptus)* in the woody Cape Nature Reserve: observations from faecal analysis". *Afr J Wildl Res.* **26**:19–25. 1996.
[8] F.Magliocca , S.Querouil, and H.Gautier, "Grouping patterns, reproduction, and dispersal in a population of sitatungas (*Tragelaphus spekei grits*)" *Can J Zool*. **80**:245–250.2002
[9] G.Seymour, "Ecological separation of greater kudu, nyala and bushbuck at Londolozi" *Afr Ecol J*. **4**:137- 145.2002.
[10] F.Fischer, and K.Linsenmair, "Changes in group size in Kobuskobkob (Bovidae) in the Comoe National Park, Ivory Coast (West Africa)" *Mamm Biol* **65**:232–242.2002.
[11] T.Wronski,A.Apio, and M.Plath, "An anay pattern of bushbuck (*Tragelaphus scriptus*) in Queen Elizabeth National P ark" *Behav proceed* **73**: 333-341.2006a.
[12] F.Magliocca,"Finally, bushbucks (*Tragelaphus scriptus*) are described as solitary bush dwellers" Yale University Press, New Haven, pp 234–246.2002.
[13] A.Apio, and T.Wronski, "Foraging behavior and diet composition of bush buck (*Tragelaphus scriptus*) in Queen Elizabeth National park Uganda" *Afr J Ecol*. **43**:1-8.2005.
[14] T.Cerling, and K.Viehl, "Seasonal diet changes of the forest hog *(Hylochoerus meinertzhageni* Thomas) based on the car bon isotopic com position of hair" *Afr J Ecol*. **42**: 88–92. 2004.
[15] T.Wronski, A.Apio, R.Tiedemann, And M. Plath, ".Cover, food, competitors and individual densities within bushbuck (*Tragelaphus scriptus*) female clan home ranges*" Actat heriologica.* **51**: 319–326.2006b.
[16] E.Civantos, "Home-range ecology aggressive behavior and survival in juvenile lizards, *Psammodromus algirus" Can J Zool*. **78**: 1681–1685.2000
[17] T.Wronski, "Home range overlap and spatial organization as indicators for territoriality among male bushbuck (*Tragelaphus scriptus*)' *J Zool Lond*. **266**: 227-235.2005
[18] R.Powell, "Animal home ranges and territories and home range estimators. [In: Research techniques in Animal ecology, controversies and consequences" L. Boitaniand T. K. Fuller, eds. Columbia University Press, New York: Pp 65–111.2000.
[19] K.Vlasman, and M.Fryxell, "Seasonal changes in territory use by red squirrels, Tamiasciurus hudsonicus, and responses to food augmentation" *Can J Zool* 80:1957–1965.2002
[20] T.Wronski, 'The Social and spatial organization of bushbuck (Tragelaphus scriptus Pallas 1776) in Queen Elizabeth National P ark, Uganda" PhD. Thesis. University of Hamburg, Hamburg. PP 222.2004.
[21] A.Apio," Foraging behavior and gastro-in test interact parasitic infections of bushbuck (*Tragelaphus scriptus*) in Queen Elizabeth N. P" MSc thesis, MbararaUniversity of Science and Technology, Mbarara: PP 1–126.2003.
[22] R.Estes, "Evolution of conspicuous coloration in the Bovidae female mimikry of male secondary characters as catalyst" In: Vrba ES, Schaller GB (eds) Antelopes, deer, and relatives.2002
[23] J.Brashares, and P.Arcese,"Role of forage, habitat and predation in the behavioral plasticity of a small African antelope" *J Anim Ecol*. **71**:626-638.2002.
[24] E.S.Adams, "Approaches to the study of territory size and shape" *Annu Rev Ecol Syst*. **32**:277–303.2001
[25] A.Atickem,Q.Loe,E.Langangen,A.Rueness,A.Bekele,and.C.Stenseth "Estimating population size Land habitat suitability for mountain neyala in areas with, differentprotectionstatus,"AnimalnConservation"Vol.14, pp.409-418.2011.
[26] Z.Girma, A.Bekele, and H.Graham,"Large mammals and mountain encroachments on mount Kaka and Hunkolo fragments, southeast Ethiopia" "Asian *Journal of Applied Scince* ,Vol.5,no.5,pp.279-289.
[27] A.Atickem, and L..Loe, "Livestock-wildlife conflicts in the Ethiopian highlands. Assessing the dietary and spatial overlap between 2012 mountain nyala and Cattle"*African journal of Ecology*"Vol.52,no,3,pp.343-351.2014.
[28] Tessema.M (2007) Community Attitudes towards Wildlife Conservation in Ethiopia Proceedings of the George Wright Society Conference.
[29] G.Ceballos,and P. Ehrlich."Global mammal distribution, biodiversity hotspots and conservation"*Pnas* 103, 19374-19379.2006.

Author profile

Mr. Rabira Gonfa has completed his master of Science in the field of Ecological and systematic Zoology from Jimma University. Ethiopia, He is currently working as a Teacher in Fitche College of teachers education and he has contributing in various ecological awareness activity

