

Species Composition and Habitat Association of Rodents in Yetere Forest, Central Ethiopia

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ABSTRACT

Species composition and habitat association of rodents were studied in Yetere forest, Central Ethiopia during August 2011–February 2012. Based on the topography and vegetation types, the study area was classified into forest (F), grassland (GL), bushland (BL) and farmland (FL) habitats. In each of the habitat types, one 4900 m² live trapping grid was marked to trap rodents using Sherman live-traps and another grid at a distance of >200 m to trap using snap-traps. A total of 333 individual rodents were captured by Sherman live-traps and 65 by snap-traps during both the wet and dry seasons. The trapped species were *Stenocephalemys albipes* (35.68%), *Acomys cahirinus* (26.38%), *Myomys fumatus* (23.87%), *Pelomys harringtoni* (8.04%) and *Mastomys natalensis* (6.03%). Further, *Hystrix cristata*, *Tachyoryctes splendens*, *Procavia capensis* and *Miniopterus inflatus* were observed in the study area, but not trapped. The composition and distribution of the trapped species varied from habitat to habitat and season to season. The highest species composition was recorded in the bushland habitat and the least was in the grassland habitat. *Stenocephalemys albipes* was widely distributed and the most abundant species in all habitats in the study area. *Mastomys natalensis*, which had the least richness and abundance, was trapped only from the farmland habitat. *Mastomys natalensis* and *P. harringtoni* were trapped only during the wet season, whereas *M. fumatus* was trapped only during the dry season. Better habitat heterogeneity and cover support more abundance of small mammals in natural habitats.

Key Words: Abundance; Distribution; Diversity; Seasonality; Small mammals; Yetere

INTRODUCTION

Ethiopia is one of the most physically and biologically diverse countries with unique environmental conditions. It has diverse ecosystems of various altitudinal ranges from 116 m below sea level (Dallol depression) to 4,620 m above sea level (Ras Dejen) with great varieties of habitats contributing for the occurrence of high biodiversity and endemism. A great proportion of endemic species, especially in the highlands of Ethiopia is the result of isolation of highland areas by the surrounding lowlands. The diverse climate, topography, water and forest resources of the country provide a wide range of habitats for supporting a great variety of fauna and flora. The diversity of altitudinal variation and

extensive area under afro-alpine habitat, compared to the rest of Africa, has also contributed to the diversity of fauna and flora of Ethiopia. Wildlife habitat types in Ethiopia range from Afro-alpine moorlands to lowland savannahs, arid lands and extensive wetlands (Yalden 1988).

Mammals are quite diverse both structurally as well as functionally. Among the more than 5,000 extant mammalian species recognized throughout the world, rodents are the most diverse and abundant. The Order Rodentia is the most numerous among all mammalian Orders. There are over 32 living Families, 468 Genera and 2272 species of rodents, which constitute 42% of the extant mammalian species (Vaughan et al. 2000, Feldhamer et al. 2007, Wolff and Sherman 2007). Among the

mammals of Africa, rodents are the most abundant (Delany 1986, Afework 1996a). In East Africa, 28% of the total mammal fauna constitutes rodents (Kingdon 1997).

Rodents are successful animals in every continent because of their small size, short breeding cycle and ability to survive on a variety of food items. They are found in vast numbers in every habitat from the high Arctic Tundra to the hottest and driest regions of the world. They are also found in different habitat types throughout the wet and dry seasons in different altitudinal zones. More species and individuals of habitat-specific rodents are found in the Afro-alpine zones (Korslund and Steen 2006). Habitat selection of rodents is based on the availability of resources such as food and shelter. Their distribution patterns and diversity are influenced by habitat complexity and heterogeneity. Habitat heterogeneity leads to an increase in species diversity and composition. Preferences of high-quality habitats have a reproductive advantage over low quality habitats. The diversity and abundance of rodents in different habitats are also determined by rainfall, food resources and predator factors (Delany and Monro 1986, Windberg 1998, Russell and Clout 2004, Tadesse and Afework 2008, Previtali et al. 2009).

Rodents are highly mobile, whose distribution is not only directly influenced by the altitude, vegetation types and climatic factors, but also strongly related to human disturbances in their habitats. During disturbances in the habitats, some species disappear, while opportunistic species such as *Mastomys natalensis* and *Arvicanthis* spp. find suitable conditions in newly cultivated lands for immediate colonization. Clearing and fragmentation of the natural forest vegetation have great impacts on the rodent fauna. Their abundance and diversity are also affected by grazing either due to shortage of food availability, unsuitable soils for burrow systems and increased predation risk (Bennett 1990).

There are accounts of rodent diversity, composition, distribution, abundance, pest status and ecological significance in different regions of Ethiopia (Yalden et al. 1996, Afework and Leirs 1997, Mohammed et al. 2010). However, no ecological investigation was carried out so far on rodent populations in Yetere forest of Gishe Rabel, and hence the present study on the diversity of rodent populations and their association with different types of habitats in Yetere forest, Central Ethiopia was conducted.

MATERIALS AND METHODS

The Study Area

The present study was carried out in Yetere forest of Gishe Rabel, located in the Central Highlands in the Amhara Regional State in the North Shoa Zonal Administration of Ethiopia. This study area is located at a distance of 365 km from Addis Ababa in the northeast direction and 235 km from capital zone, Debre Birhan in the north direction. Rabel is the capital of Gishe District, which is located at 25 km from the study area in the northwest direction. The study area lies between $10^{\circ} 29' 10''$ – $10^{\circ} 29' 40''$ N latitudes and $39^{\circ} 36' 20''$ – $39^{\circ} 36' 40''$ E longitudes. The altitude of the area ranges from 2200 to 3000 m asl. The total extent coverage of the area is around 2500 ha (Figure 1). The area has a 'bimodal' rainfall pattern having one main rainy season during June–September and a short rainy season during February–April. The area receives the highest rainfall during the main wet season and the lowest rainfall during the dry season in November–December. The average annual rainfall of the study area is around 950 mm. Temperature of the study area is characterized by relatively hot day time and cool nights. The average monthly temperature of the area is 12.8°C . The hottest month of the year is June and the coldest is November.

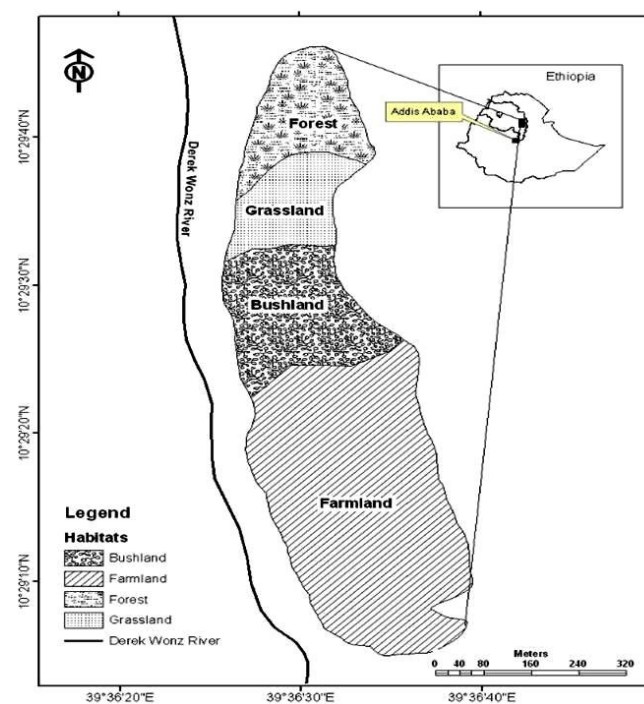


Figure 1. Location map of the study area.

The habitat types of the area were classified as forest (F), grassland (GL), bushland (BL) and farmland (FL). The vegetation type in Yetere area is characterized by tall and short natural vegetation. The vegetation is dominated by diverse species of tall trees, bushes and *Erica* scrub, depending on the topography and type of soils in the area. High altitudinal locations in the area are covered by *Erica* species, whereas areas at lower altitudinal ranges are covered by tall trees or woody plants. The common vegetation types in the study area are *Otostigia integrifolia*, *Dodonaea angustifolia*, *Rhus retinorrhoea*, *Rumex nervosus*, *Steganotaenia araliacea*, *Acacia abyssinica*, *Carissa spinarum*, *Juniperus procera*, *Olea europaea*, *Rhus glutinosa*, *Ficus sur* and *Ficus vasta*.

Yetere forest is also a home to variety of mammals including Menelik's bushbuck (*Tragelaphus scriptus menelikii*), aardvark (*Orycteropus afer*), common jackal (*Canis aureus*), spotted hyaena (*Crocuta crocuta*), leopard (*Panthera pardus*), Ethiopian hare (*Lepus fagani*), Ethiopian genet (*Genetta abyssinica*), grivet monkey (*Cercopithecus aethiops*) and gelada baboon (*Theropithecus gelada*). Gelada baboon, which is an endemic species of Ethiopia, is the most abundant among the mammals in the study area.

METHODS

A preliminary survey was conducted during the last week of July, 2011 in the study area to collect relevant information such as climatic condition, topography, fauna, flora and features and habitat types. Based on the topography and vegetation types, the study area was classified into forest (F), grassland (GL), bushland (BL) and farmland (FL) habitats. Representative grids were randomly selected in these habitats. Each grid had an area of 4900 m² and a code number was given for each grid. Both live-traps and snap-traps were used for data collection. Snap-trapping sites were located at a distance >200 m from live-trapping site.

Trapping of rodents was carried out during August, 2011–February, 2012. Data were collected during both the wet season (August and September) and dry season (November–February). This was conducted twice during the wet season and twice during the dry season with a minimum of 30 days intervals. Data were also gathered by direct and indirect evidences in the study area.

A total of 49 Sherman live-traps were set, each 10 m apart in each grid of 70x70 m. Traps were baited with

peanut butter. Traps were checked in the morning (06:00–08:00 h) and in the afternoon (17:00–18:30 h). Trapping was done for three consecutive days in each session. The traps were covered with grass and plant leaves during the dry season to provide protection and to reduce mortality of the species trapped by thermal stress. Each of the captured rodents was transferred into a transparent polyethylene bag. The weight, sexual condition, approximate age and the species were recorded, and they were toe-clipped and released in the same locality. Sexual condition (perforated vagina, closed vagina, pregnant, lactating) of females and the position of testicles (scrotal or abdominal) for males were recorded. Pregnant females were identified by their enlarged nipples, large swollen abdomen and body weight. Age structure (adult, sub-adult and young) was recorded based on their body size and weight (Afework 1996a).

For species identification, taxonomic characteristics listed in Yalden et al. (1976), Afework (1996b) and Nowak (1999) were used. Voucher skins and skulls were prepared and compared with the specimens available in the Zoological Natural History Museum of Addis Ababa University. Shannon–Weaver Index (H') was used to compute species diversity in the habitats. Chi-square test was used to compute species abundance, distribution, relative abundance and habitat association of rodents.

RESULTS

A total of 398 individuals belonging to five species of the Order Rodentia (Family: Muridae) was trapped using both live and snap-trapping techniques during the present study. Out of the total captured rodents, 333 individuals were trapped by Sherman live-traps in 2352 trap nights and 65 were trapped by snap-traps in 1200 trap nights during both the wet and dry seasons.

Rodent species recorded were *Stenocephalemys albipes* (Rüppell, 1842), *Acomys cahirinus* (Desmarest, 1822), *Myomys fumatus* (Peters, 1878), *Pelomys harringtoni* (Thomas, 1903) and *Mastomys natalensis* (Smith, 1834). Presence of other small mammals such as *Hystrix cristata* (Linnaeus, 1758), *Tachyoryctes splendens* (Rüppell, 1836), *Procavia capensis* (Pallas, 1766) and *Miniopterus inflatus* (Thomas, 1903) were recorded from the study area directly or through indirect evidences. Presence of burrow soils of *T. splendens* and quills for *H. cristata* were observed in the farmland habitat in the study area (Table 1). *Procavia capensis*

was observed in farmland and natural habitats and bat, *M. inflatus* was observed in houses, on the trees and in the cave nearby the study area during the night. Among the recorded individuals, *S. albipes* was the most abundant species (142, 35.68%); followed by *A. cahirinus* (105, 26.38%), *M. fumatus* (95, 23.87%), *P. harringtoni* (32, 8.04%), and *M. natalensis* (24, 6.03 %) was the least abundant in the study area.

Table 1. Species composition, abundance and relative abundance (RA) of rodents trapped in Yetere forest (* observed, but not trapped).

Family	Species	Number	RA (%)
Muridae	<i>Stenocephalemys albipes</i>	142	35.68
	<i>Acomys cahirinus</i>	105	26.38
	<i>Myomys fumatus</i>	95	23.87
	<i>Pelomys harringtoni</i>	32	8.04
	<i>Mastomys natalensis</i>	24	6.03
Hystricidae	<i>Hystrix cristata</i>	*	*
Rhizomyidae	<i>Tachyorcytes splendens</i>	*	*
Miniopterinae	<i>Miniopterus inflatus</i>	*	*
Procaviidae	<i>Procapra carvensis</i>	*	*
Total	9 species	398	100

Distribution and abundance of live-trapped rodents in different habitats are shown in Table 2. More individuals were captured from bushland habitat (110, 33.03%), followed by forest (90, 27.02 %), farmland (74, 22.22%) and grassland habitat (59, 17.72%). The abundance of rodents among different habitats showed statistically significant variations ($\chi^2 = 17.23$, $df = 3$, $P < 0.05$).

Table 2. Distribution and abundance of live-trapped rodents in different habitats.

Species	Habitat types				
	Total	F	GL	BL	FL
<i>Stenocephalemys albipes</i>	39	34	37	8	118
<i>Acomys cahirinus</i>	0	0	42	47	89
<i>Myomys fumatus</i>	40	25	17	0	82
<i>Pelomys harringtoni</i>	11	0	14	0	25
<i>Mastomys natalensis</i>	0	0	0	19	19
Total	90	59	110	74	333

(F= Forest, GL= Grassland, BL= Bushland, FL= Farmland).

Richness, diversity and evenness of rodent species varied from habitat to habitat in the present study area (Table 3). The highest species richness was observed in the bushland habitat, followed by forest and farmland habitats. The highest diversity ($H' = 1.28$) was observed in the bushland habitat, followed by forest ($H' = 0.97$), farmland ($H' = 0.88$) and grassland ($H' = 0.68$). Simpson's diversity index was also high in the bushland ($D = 0.70$), followed by forest ($D = 0.62$) and the lowest in grassland ($D = 0.48$). The highest species evenness was observed in the grassland habitat ($E = 0.98$), followed by forest ($E = 0.88$), bushland ($E = 0.83$) and the lowest in farmland ($E = 0.80$).

Table 3. Diversity of live-trapped rodent species in different habitat types

Habitat types	Number of Trapped Species	Number of Trapped Animals	H'	D	H _{max}	E
Forest	3	90	0.97	0.62	1.10	0.88
Grassland	2	59	0.68	0.48	0.69	0.98
Bushland	4	110	1.28	0.70	1.39	0.92
Farmland	3	74	0.88	0.52	1.10	0.80

(H' = Shannon-Weaver diversity index, D = Simpson's diversity index, H_{max}=Natural logarithm of the total number of species, E= Evenness).

Abundance of rodents in the study area varied between seasons. All species except *M. fumatus*, were trapped during the wet season, but *P. harringtoni* and *M. natalensis* were not trapped during the dry season. All the four species were captured during the wet season, whereas only three species were captured during the dry season. However, species composition between the wet and dry seasons did not vary statistically ($\chi^2 = 0.14$, $df = 1$, $p > 0.01$). There was statistically significant difference in the number of individuals trapped during the two trapping sessions of the wet season ($\chi^2 = 8.4$, $df = 1$, $p < 0.05$). But, there was no significant difference in the number of individuals trapped during the two trapping sessions of the dry season ($\chi^2 = 1.9$, $df = 1$, $P > 0.01$) (Table 4). The seasonal abundance of *S. albipes*, *A. cahirinus*, *M. fumatus*, *P. harringtoni* and *M. natalensis* showed statistically significant variation ($\chi^2 = 5.75$, $df = 1$, $p < 0.05$, $\chi^2 = 36.51$, $df = 1$, $p < 0.05$, $\chi^2 = 82$, $df = 1$, $p < 0.05$, $\chi^2 = 25$, $df = 1$, $p < 0.05$, $\chi^2 = 19$, $df = 1$, $p < 0.05$, respectively). The overall abundance of rodents during the wet and dry seasons did not show significant variations ($\chi^2 = 0.15$, $df = 1$, $P > 0.05$).

Table 4. Abundance of rodents live-trapped during different sessions.

Species	Wet I	Wet II	Dry I	Dry II
<i>Stenocephalemys albipes</i>	21	25	27	45
<i>Acomys cahirinus</i>	42	31	16	0
<i>Myomys fumatus</i>	0	0	51	31
<i>Pelomys harringtoni</i>	0	25	0	0
<i>Mastomys natalensis</i>	0	19	0	0
Total	63	100	94	76
Percentage	18.92	30.03	28.22	22.82

Four species of rodents were trapped from the bushland habitat during the wet season and three species were trapped during the dry season. During the wet season, three species were trapped in farmland habitat, whereas only two species were trapped during the dry season. During the dry season, two species each was captured from forest, grassland and farmland habitats, whereas, three species were recorded from bushland habitat. The number of species trapped from the forest habitat during both the wet and dry seasons was similar (Table 5). The overall species composition among the four habitats was not statistically different during the wet and dry seasons ($\chi^2=0.67$, $df=3$, $p>0.05$). From the total individuals live-trapped, males comprised 176 (52.85 %) and females comprised 157 (47.15 %) individuals. The ratio of live-trapped females to males did not differ significantly from 1:1 ($\chi^2=1.08$, $df=1$, $P>0.05$) between seasons.

During the wet season, more individuals were trapped from the farmland habitat (65), followed by bushland (58), forest (24) and grassland (16). However, during the dry season more individuals were trapped from the forest habitat (66), followed by bushland (52),

grassland (43) and farmland (9) (Table 5). There were seasonal variations in the abundance of individuals trapped from forest, grassland and farmland habitats ($\chi^2=19.6$, $df=1$, $p<0.05$, $\chi^2=12.36$, $df=1$, $p<0.05$, $\chi^2=42.38$, $df=1$, $p<0.05$, respectively). However, there was no seasonal variation in the abundance of small mammals trapped from bushland habitat between the wet and dry seasons ($\chi^2=0.33$, $df=1$, $p>0.05$) (Table 5).

Trap success of rodents varied from habitat to habitat and from season to season. The overall mean trap success during wet and dry seasons was 15.31% from forest, 8.34% from grassland, 18.71% from bushland and 12.59% from farmland. The mean trap success ranged from 4.42% during the wet season in the grassland habitat to 20.75% during the dry season in the forest habitat. During the wet season, mean trap success was highest in the farmland habitat with 20.41%, followed by bushland (19.05%), forest (9.86%) and grassland (4.42%). The dry season mean trap success was highest in the forest (20.75%), followed by bushland (18.37%), grassland (12.25%) and farmland (4.76%). Mean trap success in forest and farmland habitats showed statistically significant variation between wet and dry seasons ($\chi^2=3.88$, $df=1$, $p<0.05$, $\chi^2=9.5$, $df=1$, $p<0.05$, respectively). However, mean trap success in the grassland and bushland habitats did not show statistically significant variations between seasons ($\chi^2=3.68$, $df=1$, $p>0.05$, $\chi^2=0.01$, $df=1$, $p>0.05$, respectively). The mean overall trap success from all habitats in the study area did not show statistically significant variation between the wet and dry seasons ($\chi^2=4.19$, $df=3$, $p>0.05$).

DISCUSSION

During the present study, more diversity and abundance of rodent species were recorded in natural habitats than in the farmland habitat. Dense and diverse vegetation

Table 5. Seasonal abundance of live-trapped rodents from different habitats in the study area.

Species	Forest		Grassland		Bushland		Farmland	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
<i>Stenocephalemys albipes</i>	13	26	16	18	13	24	6	2
<i>Acomys cahirinus</i>	0	0	0	0	31	11	40	7
<i>Myomys fumatus</i>	0	40	0	25	0	17	0	0
<i>Pelomys harringtoni</i>	11	0	0	0	14	0	0	0
<i>Mastomys natalensis</i>	0	0	0	0	0	0	19	0
Total	24	66	16	43	58	52	65	9

types in natural habitats might be more suitable for small mammals during the dry season for refugia. Demeke et al. (2007) also reported more diversity of rodent species in natural ecosystem than in modified ecosystem. Among the trapped rodents, *S. albipes* was the most widespread and abundant species, which was found in all habitat types. However, it was trapped more from the natural habitats. This result agrees with the findings of Sintayehu et al. (2011) from Nechisar National Park and Zerihun et al. (2012) from Kaka and Hunkolo, southeast Ethiopia. *Stenocephalemys albipes* is one of the endemic rodent species of Ethiopia and is common in many parts of the country (Yalden 1988, Yalden and Largen 1992, Hillman 1993, Afework 1996a).

The spiny mouse, *A. cahirinus* was the second most abundant species in the study area, which is known as an agricultural pest. This species is also commonly associated with *Rattus rattus* in villages (Mahmoud and Redfern 1981). *Acomys cahirinus* occupies different microhabitats due to its adaptability and ability to withstand harsh environmental conditions (Shanas et al. 2003). Similarly, Tilahun et al. (2012) recorded this species from bushland and farmland habitats. However, Tadesse and Afework (2008) recorded spiny mouse mainly from grassland habitat in Alatish National Park. *Acomys cahirinus* was common in arid lowland regions, often in *Acacia* scrub land. In Ethiopia, this species was reported as common in areas from sea level up to 1500 m altitudinal ranges (Yalden et al. 1976).

Myomys fumatus was the third most abundant species in the study area. This species was captured from forest, grassland and bushland habitats, but not from farmland habitat. Similarly, it was trapped from forest, grassland and bushland habitats from Nechisar National Park by Sintayehu et al. (2011). This species occurs in different habitats, from forests at 1000 m up to the Afro-Alpine moorlands above 4000 m asl, and is widespread across African countries (Fadda and Corti 2000).

Pelomys harringtoni was the fourth abundant species, captured from forest and bushland habitats in the present study area. Trap success of this species was low compared to *S. albipes*, *A. cahirinus* and *M. fumatus* during the present study. *Pelomys harringtoni* is an Ethiopian endemic species and is restricted in distribution to the Ethiopian highlands (Tadesse and Afework 2008) where they are abundant at altitudes between 1800–2800 m asl. This species might be arboreal and survive in forest habitats (Yalden and Largen 1992).

Mastomys natalensis was the least abundant species of rodents recorded during the present study. This

species was trapped only from the farmland habitat. However, Demeke et al. (2007) and Tilahun et al. (2012) reported that this species was the most abundant and widely distributed species of rodents in all their study habitats within the altitudinal ranges of 1000–1200 m above sea level, with more abundance in farmland and bushland habitats. In addition, Serkebirhan et al. (2011) have found this species in all age categories of sugarcane plantations. It is also one of the most widely distributed and abundant rodents in Africa. This species is also distributed widely over most of the areas in Ethiopia (Yalden et al. 1976, Afework and Leirs 1997) with a wide distribution in altitudes ranging between 500–2900 m asl. Ayenew (2009) recorded this species in grassland and farmland areas, with more abundance in maize farm. This shows that this species is a pest in farmland habitats.

The species richness in the present study area was lower than the findings of Demeke et al. (2007) and Mohammed et al. (2010), who have recorded 14 and 17 species of small mammals from Arbaminch forest and farmlands and Galama Mountain ranges, respectively, of Ethiopia. This might be due to the differences in the habitats including various environmental and biological factors. Species richness and diversity were highest in the bushland, followed by forest habitat in the present study area. The bushland habitat had the greatest number of species composition and abundance of rodents. In the present study area, the presence of more diversity of rodent species in the bushland habitat might be associated with the heterogeneous habitat type, which provides food and shelter. In addition, moisture content of the soil and moderate temperature in the habitat might also favour rodents to prefer such habitats (Barnett et al. 2000, Tilahun et al. 2012), which provides hiding places or increased foraging opportunities. This also reveals that the grassland habitat might be less suitable for rodents due to the absence of protective cover and predation risk.

The species composition and abundance varied between seasons. Each season shows variation in the habitat cover and food availability. In this case, some species that occur in one season might not show up in the other season. For instance, *M. fumatus* was not trapped during the wet season and *M. natalensis* and *P. harringtoni* during the dry season. The overall abundance of species in the present study area did not show seasonal variation. However, the abundance of each species within the different habitats showed seasonal variations. For instance, the abundance of *A.*

cahirinus in the farmland was more during the wet season and *M. fumatus* during the dry season in natural habitats. During the dry season, forest and grassland habitats had more abundance of rodents and less abundance in farmland. Such seasonal fluctuations are related to the abundance of vegetation cover, availability of food and water. Food shortage and reduced ground cover might affect rodent communities in different habitats and seasons. High capture rate of *M. fumatus* during dry season in the present investigation could be due to immigration of the species from the surrounding areas. The present study showed that the population of small mammals is relatively less during the wet season and more during the dry season. Similar population trends were also reported by Workneh et al. (2004), Demeke et al. (2007) and Tadesse and Afework (2008) in their respective study areas. Farmland habitats may have suitable cover and source of food during the wet season in relation to the growth and development of crops in the farmed area. It can be also related with the nestling and feeding requirements of the species (Telleria et al. 1991, Sassi et al. 2011, Tilahun et al. 2012). The sex ratio of most species did not vary significantly. However, the present study revealed that males were more than females. More capture of males might be due to their higher levels of exploratory behaviour than that of females.

Trap success during the present study varied between habitats and seasons. The highest mean trap success was obtained from forest (20.75%) during the dry season. This might be associated with low predation risk and food availability. The lowest trap success was recorded from grassland habitat during the wet season (4.42%). Mean trap success was highest in bushland and forest habitats due to higher capture rates of *S. albipes* and *M. fumatus*. The overall mean trap success during the present study was 13.74%. Sanchez-Cordero et al. (2005) described that deforestation is the major factor to reduce the quality of small mammal habitats. This might be due to seasonal fluctuation in food availability. When more food is available in the habitat, capture rates may decrease as the bait used might become unattractive as a result of more food availability in the habitat (Ahmad and Parshad 1985, Demeke et al. 2007). During the dry season, there is a shortage of food in the surroundings and rodents might be attracted by the peanut butter bait, which led to the increase in the rate of trapping.

CONCLUSION

The present investigation provided valuable information on the species composition, abundance and habitat association of small mammals in Yetere area. During the present investigation, a total of ten species of small mammals were recorded from four randomly selected habitats. Among these, five rodent species were trapped and the other four small mammal species were observed in the study area. There was a difference in species composition, abundance and distribution of small mammals in different habitats. This was associated with habitat adaptability of the species, vegetation complex, food availability, predation risk and human disturbances in the area. Bushland habitat had relatively better habitat heterogeneity, cover and hence it supports greater abundance of small mammals. The grassland had the lowest abundance of small mammals. The composition, abundance and distribution of species also varied during the wet and dry seasons in the present investigation depending on food availability and vegetation covers. More pregnant females were recorded during the wet season. Breeding of small mammals is correlated with food availability and rainfall patterns.

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