ASSESSMENT OF TERRESTRIAL SMALL MAMMALS IN DUBAI EMIRATE'S INLAND DESERT

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Abstract

This study investigated the small mammal community of the Dubai Desert Conservation Reserve (225 Km²), Dubai, United Arab Emirates. We aimed to determine the diversity and distribution of rodents in two different habitats: (i) sand dunes and (ii) gravel plains. Using 240 trap-nights, four rodent species were captured.

The most frequent species were *Gerbillus cheesmani* followed by Meriones crassus, *Gerbillus nanus* and *Acomys carhinus*. Indices of species richness (S) and diversity (H') were greatest in gravel plains followed by sand dunes. Some expected species, such as *Meriones arimalius* were not found during the survey. *Acomys carhinus* was found only in one location of the reserve.

Introduction

In arid environments, species have adapted to limited availability of water, and small mammals in most deserts respond positively to rainfall (Previtali et al., 2009; Shenbrot et al., 2010; Thibault et al., 2010b). Long-term biotic responses to rainfall can be confused with changes in shrub cover and in the make-up of small mammal species. Biotic interactions can play key roles in systems that appear largely structured by abiotic influences. (Kelt, 2011) Seed consumption and omnivorous diet is considered to be common in all desert small mammals.

Therefore, the consumption of seeds available in a community is important to get a full understanding of a desert ecosystem. According to Peter and Aspinal (2005), at least 11 species of rodents occur in the United Arab Emirates. Our aim was to complete an intensive systematic survey of rodent populations.

Study Area

The study area is located in the Dubai Desert Conservation Reserve (DDCR: 24° – 25° Latitude and 55° – 56° longitude), in Dubai, United Arab Emirates. The reserve has an area of approximately 225 square kilometres and is located 65km outside of Dubai city, between Margham and Al Faqaa.

Methodology

The study aims to provide a baseline survey of the rodent communities in the DDCR; and to assess the community structure and the distribution of the individual rodent species and species distribution patterns on different habitat types (Sand Dunes and Gravel Plains).

Using Hawth's Analysis Tools© version 3.27 allowed us to generate a total number of random points and allowed the specification of a minimum distance to be enforced between generated points. With the aid of the plot sampling tools random points were generated with consideration to the different habitats.

The Hawth's Analysis Tools randomly selected 40 points which were evenly distributed between the sand dunes and the gravel plains with 20 points for each habitat type. At each site, a circular plot of 50 m diameter was selected giving a total sampled area across the reserve of approximately 78,520 m2. For each plot, 3 traps were placed along the four compass directions (Fig 2). The distance between each trap was 10m, giving a total of 12 traps per site. Trap lines were set for a period of 6 nights at each site.

Data Analysis

Assessment of Trapping Success

In this survey we adopt the trapping success index which suggests that catch per unit effort or trapping success does not necessarily represent the relative abundance of the organisms being sampled (Kennedy, 1951)

Fig 1. Study site location

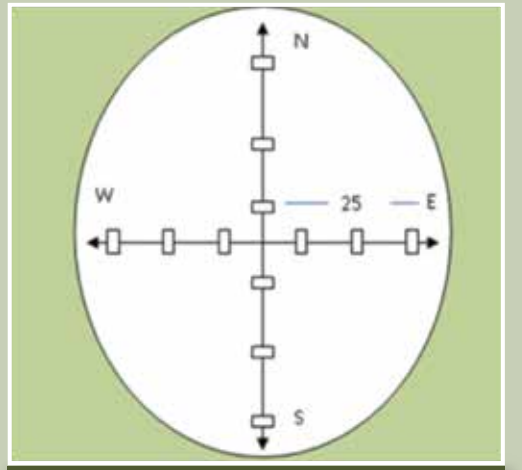

Fig 2. Trap positions for each plot site (n= 40 plots)

This is so if traps are removed from the trapping efforts when they were triggered by, the species under the study, non-target species, as well as when they were triggered accidentally due to other factors like wind storms, rain, etc. Patrick, (1970) when looking at these influences also suggested that insects eating the bait could be considered a limiting factor affecting the catching effort.

In this study, we followed the method to estimate the trapping success proposed by (Simonetti, 1986).

TS=A×100/(TU-NA)

Where TS is the trapping success expressed as rodents captured per 100 trapping units. A is the number of rodents caught. TU is the number of trapping units

TU=P×I×N

where P is the number of trapping intervals (ie. Nights), I is the length of trapping intervals (in meters), N is the number of traps being used and NA is the number of unavailable number of traps for the small rodents.