

Diversity of mammals in the Lower Drâa valley. A preliminary survey

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Introduction

The region of the Lower Drâa valley, between Assa, Zag and Msseyed contains an exceptional range of desert/arid habitats and biodiversity. The area is located in the transition zone between pre-Saharan arid habitats and Saharan desert habitats, as well as in the shift between the Atlantic coastal region and the continental desert. Climatically, the lower average annual temperatures and higher precipitations are characteristic of higher latitude areas and regions closer to the ocean or of higher altitudes (e.g. Le Houérou 1990; Mokhtari *et al.* 2013). The habitat heterogeneity, variation and type of water resources (rivers, oases, wells) and a West to East gradient influenced by the proximity to the Atlantic Ocean are all factors that influence the distribution of wildlife (e.g. Saaidi 2003; Cuzin 2003). The region is relatively small (less than 200 km by 100 km) and it contains a diversity of habitat types, making it a prime research area to study how different species assemblages vary across environmental gradients.

Methods

A field expedition to inventory mammal species was undertaken along the Drâa valley between Assa, Zag and Msseyed, between 2 and 9 of February 2016. The inventory was conducted by night observations, live capturing and voice detection (Hoffman *et al.* 1996). Capturing was conducted by live trapping (Heavy duty large kangaroo rat Sherman traps) and capture with hand nets. The Sherman traps were deployed in the afternoon and collected the following morning. Captured animals were weighed, photographed and their body dimensions measured before being released at their original capture point (Table in Annex). The capture points were georeferenced with accurate coordinates. ArcGis (ESRI 2011) was used to map the locations using as background (Esri) satellite imagery to visualise habitat structuring.

Species were identified based on morphological measurements and on the colouration patterns (Aulagnier *et al.* 2008). The presence of *Canis anthus* was identified by detecting its voice in the night.

Results

In total, 53 observations were made for 10 species (22 *Jaculus jaculus*, 10 *Gerbillus amoenus*, 1 *G. gerbillus*, 4 *G. tarabuli*, 3 *Meriones libycus*, 1 *G. campestris*, 1 *Acomys cahirinus*, 4 *Lepus capensis*, 2 *Canis anthus*, 5 *Pachyuromys duprasi*).

The locality of each specimen is detailed in the appendix.



Figure 1. Map of the studied area, with inserted context map of Morocco and focus area for overlapped points. White squares are symbols for human settlements. Satellite images provided by Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User community

We have found that even during a short but intensive survey, many species can be detected in the Lower Drâa valley, which suggests strongly that a potentially high mammal diversity may be uncovered by further studies in the area. The habitat variability is likely to be responsible for this high species diversity and it will be interesting to test how the habitat structure influences species composition. Since several species assemblages exist in variable habitats and throughout a gradually changing environment, studies can be established looking into the responses of different species to climatic variation and to climate change. Due to the fact that this area is on the edge of the true desert, it may prove to be interesting for experimental studies on the effects of desertification.

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Appendix: location and species detected in the Lower Drâa valley

Species	Date	Latitude	Longitude	Species	Date	Latitude	Longitude
<i>Acomys cahirinus</i>	05.02.2016	28.409	-9.892	<i>Jaculus jaculus</i>	08.02.2016	28.062	-10.549
<i>Canis anthus</i>	07.02.2016	28.256	-9.889		08.02.2016	28.076	-10.559
	04.02.2016	28.380	-9.894		08.02.2016	28.077	-10.566
<i>Gerbillus amoenus</i>	06.02.2016	28.053	-9.329		08.02.2016	28.090	-10.536
	08.02.2016	28.062	-10.549		08.02.2016	28.100	-10.525
	08.02.2016	28.077	-10.566		07.02.2016	28.237	-9.954
	06.02.2016	28.078	-9.324		07.02.2016	28.242	-9.934
	07.02.2016	28.236	-9.956		07.02.2016	28.244	-9.930
	07.02.2016	28.251	-9.908		07.02.2016	28.246	-9.922
	04.02.2016	28.374	-9.902		07.02.2016	28.256	-9.889
	04.02.2016	28.377	-9.876		04.02.2016	28.362	-9.853
	04.02.2016	28.378	-9.880		04.02.2016	28.362	-9.853
	03.02.2016	28.394	-9.908		04.02.2016	28.365	-9.851
<i>Gerbillus campestris</i>	02.02.2016	28.437	-9.699		04.02.2016	28.374	-9.868
<i>Gerbillus gerbillus</i>	06.02.2016	28.053	-9.329		04.02.2016	28.377	-9.876
<i>Gerbillus tarabuli</i>	06.02.2016	28.078	-9.324		02.02.2016	28.503	-9.598
	07.02.2016	28.236	-9.956		02.02.2016	28.512	-9.568
	04.02.2016	28.378	-9.880		02.02.2016	28.513	-9.559

Mammals of the Lower Drâa valley

	05.02.2016	28.595	-9.419		05.02.2016	28.515	-9.564
<i>Jaculus jaculus</i>	06.02.2016	28.060	-9.341	<i>Lepus capensis</i>	09.02.2016	28.019	-10.757
	08.02.2016	28.062	-10.549		06.02.2016	28.175	-9.306
	09.02.2016	27.908	-10.885		07.02.2016	28.489	-9.402



Some mammals of the Drâa valley (photos ZB)