

USE CAMERA TRAPS TO ESTIMATE MAMMALIAN SPECIES RICHNESS AND OCCURENCE

FIRST INSIGHTS FROM THE MONGOLIAN STEPPE

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Introduction

Mongolia is known to host a wide diversity of mid-large mammal fauna^[1], comprising species of conservation relevance. Nevertheless, information on species occurrence and abundance are still scarce^[2] and based on local people experience.

Aims:

- getting a first checklist of large and medium-sized mammals in the study area (i.e. >1 kg; Tab.1);
- estimating the relative abundance and naïve occupancy of the detected species (Tab.2).

Methods

The study was conducted in the Bayan Onjuul district (N47°02'19"; E105°57'23") lying in the South-Western Mongolian-Manchurian Grassland Ecoregion (Fig.1). The area is covered in nearly flat and rolling grasslands, with sparsely isolated granite mountains (Fig.2 and Fig.3), sandy dunes and saline wetlands^[3].

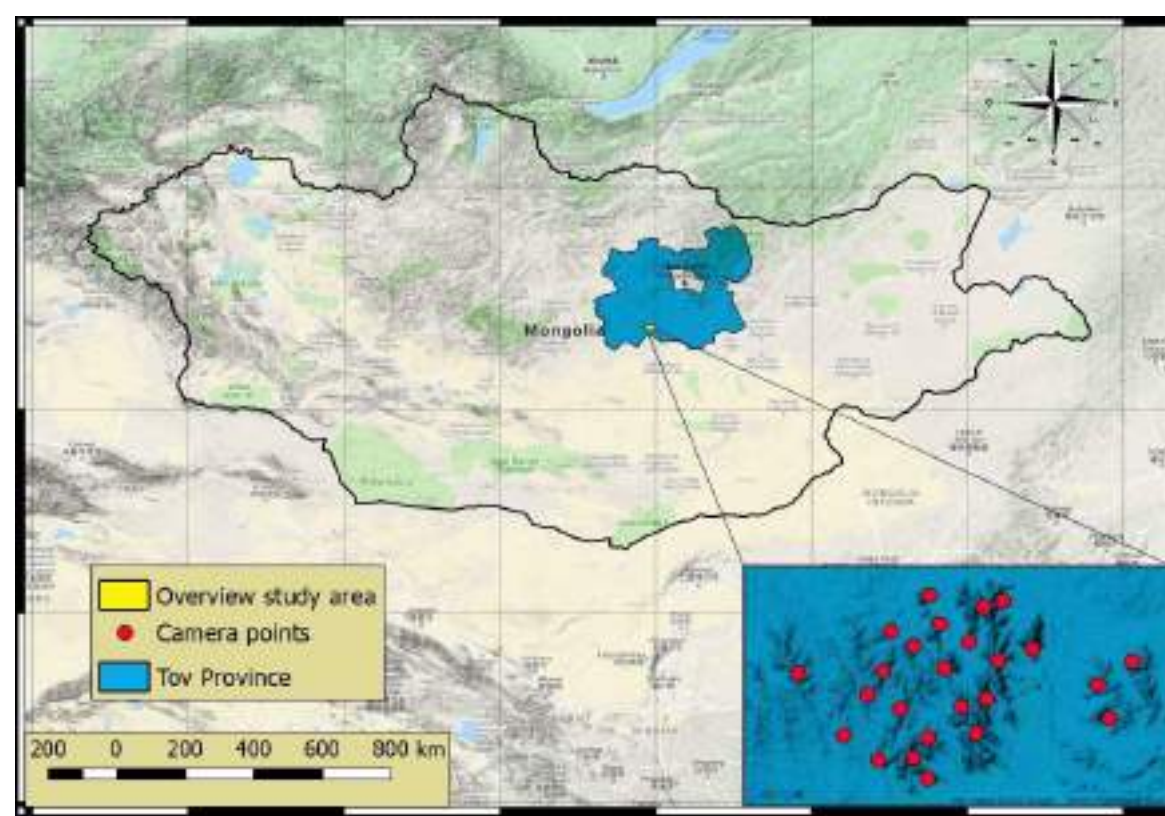


Fig.1 Study area with sampling sites locations.

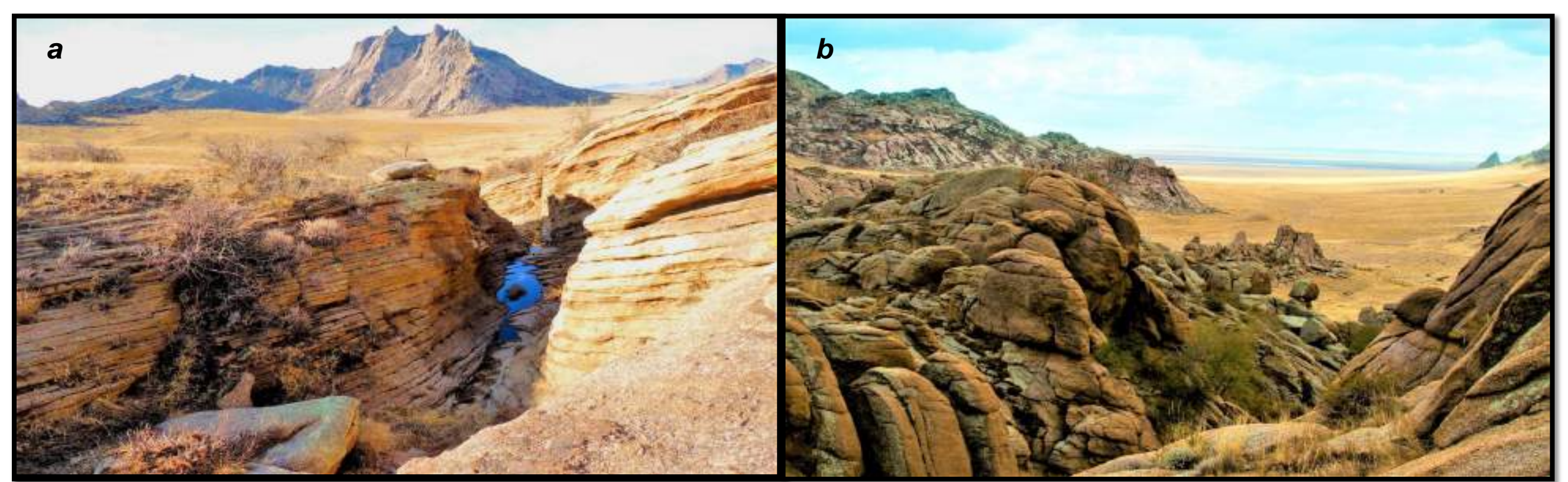


Fig.2 Granite mountains characterizing the study area.

Twenty-five cameras were deployed over an area of approximately 200 km² (elevation range 1292-1580 m a.s.l.) from July to October 2017 and left unattended for a minimum of 70 days; each cameras were set-up at a distance of 1.5-4 km from each others.

Images collected were analysed entering species identification and metadata using open-source software (Wild.ID)^[4]. Afterwards, independent detection events (i.e. images of the same species taken within a span of 30 minutes were scored as a single event), RAI (Relative Abundance Index) and naïve occupancy (the fraction of sites where the species was detected on the total number of sites), were calculated for every single species found^[5] (Tab.2).

Common name	Scientific name	IUCN	Regional Red List	CITES
Grey wolf	<i>Canis lupus</i>	LC	NT	App. II
Siberian ibex	<i>Capra sibirica</i>	LC	NT	-
Red deer	<i>Cervus elaphus</i>	LC	CT	-
Tolai hare	<i>Lepus tolai</i>	LC	LC	-
Beech marten	<i>Martes foina</i>	LC	LC	-
Asian badger	<i>Meles leucurus</i>	LC	LC	-
Daurian pika	<i>Ochotona dauurica</i>	LC	LC	-
Pallas' cat	<i>Otocolobus manul</i>	NT	NT	App. II
Argali sheep	<i>Ovis ammon</i>	NT	EN	App. II
Red fox	<i>Vulpes vulpes</i>	LC	NT	-

Tab.1 Mammal checklist of the species and their global and regional status.

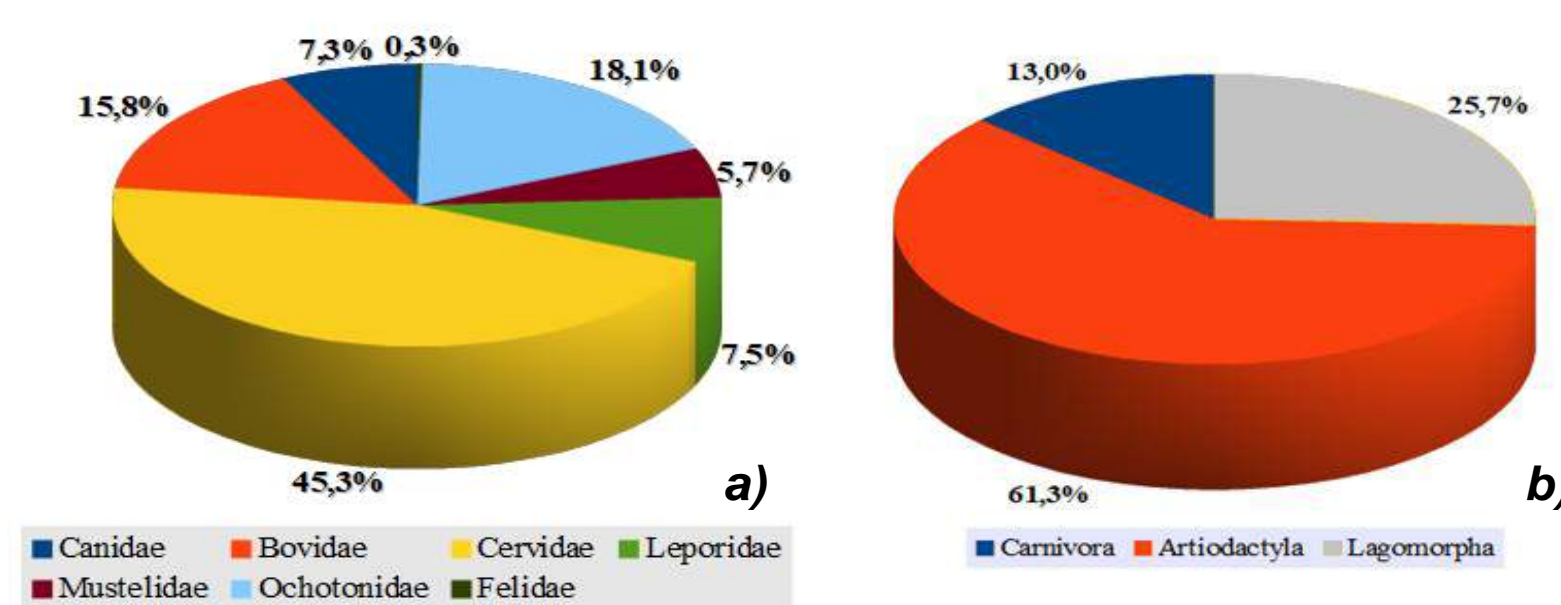


Fig.3 Percentage of each order(a) and families(b) gathered in our study.

Species	Events	Number of Occupied Sites	Naïve Occupancy	RAI
Argali sheep	55	14	0.78	4.79
Siberian ibex	6	5	0.28	0.52
Wapiti deer	175	16	0.89	15.23
Tolai hare	29	7	0.39	2.52
Daurian pika	70	3	0.17	6.09
Red fox	26	8	0.45	2.26
Beech marten	21	7	0.39	1.83
Grey wolf	2	1	0.06	0.17
Pallas' cat	1	1	0.06	0.09
Asian badger	1	1	0.06	0.09

Tab.2 List of the species detected with the Relative Abundance Index (RAI) and naïve occupancy.

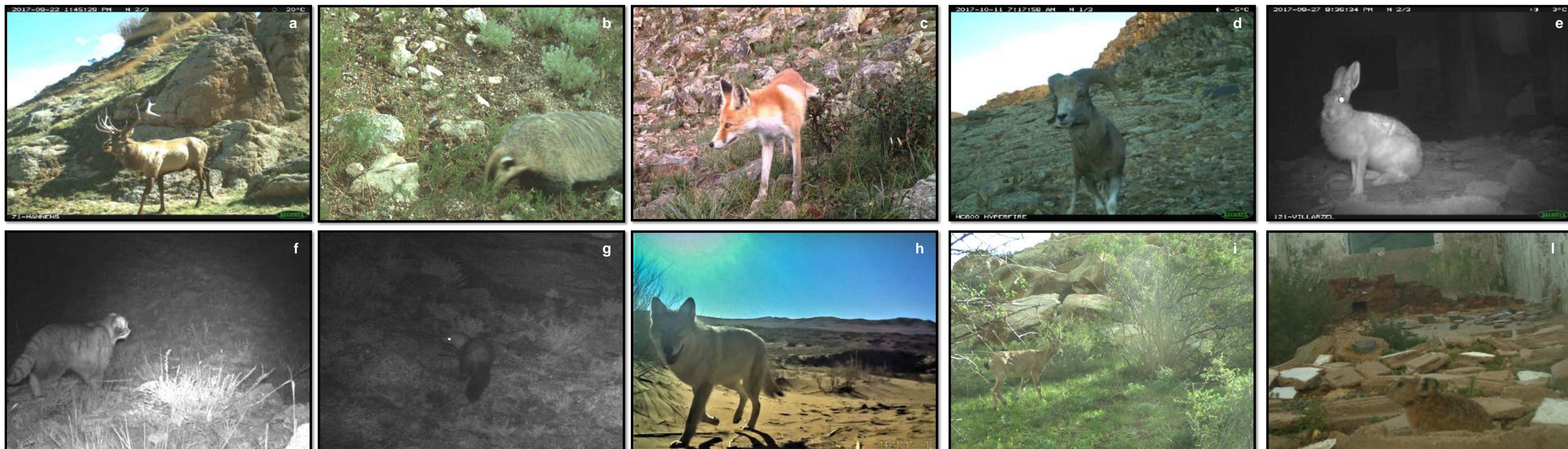


Fig.4 Images of the captured species: a) Wapiti deer; b) Asian badger; c) Red fox; d) Argali sheep; e) Tolai hare; f) Pallas' cat; g) Beech marten; h) Grey wolf; i) Siberian ibex; j) Daurian pika.

Results

- An effort of 1149 camera days was cumulated in the overall sampling period;
- 10 species of mammals were recorded, representing 3 orders and 7 families (Fig.3a and Fig. 3b);
- 410 independent detection events were recorded; most of detection are related to Artiodactyla (236 independent events), followed by Lagomorpha (99 events) and Carnivora (51 events) (Tab.2);
- Two ungulates species, Wapiti deer (*Cervus canadensis*) and Argali sheep (*Ovis ammon*) were detected with relatively high frequency, with 175 and 55 independent events at 16 and 14 sites respectively (Tab.2);
- All carnivores's species were recorded in few captures at a small number of sites. The most captured were the Red fox (*Vulpes vulpes*) and the Beech marten (*Martes foina*), both species detected in 26 independent events on 8 and 7 sites respectively (Tab.2).

Discussion and future perspectives

We have conducted the first systematic camera trapping study of mammal community in the Bayan Onjuul district (Tov province). Our results demonstrated that small mountainous areas laying throughout the South-West Mongolian-Manchurian Grassland represents an important refuge for large ungulates and carnivores populations. Wapiti deer were frequently detected despite the steppe ecosystem does not represent a preferred habitat for this species. Local people said that the Wapiti deer occupied this area less than 30 years ago, while before it was absent. A large amount of photographic captures in our study area demonstrates the species is spreading its distribution range towards the SW Mongolian-Manchurian Grassland Ecoregion. Despite we recorded five carnivore species, all of them have been recorded in extremely low number. It may be explained by uncontrolled hunting and by the human impact on breeding sites (particularly the shepherd dogs could kill any carnivore smaller than wolf). This study should be a starting point encouraging future researches in the Mongolian-Manchurian Grassland Ecoregion. More detailed data concerning the species abundance and distribution could address the local and central authorities towards the conservation of priority areas.

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