

First evidence of scavenging behaviour in the herbivorous lizard *Uromastyx aegyptia microlepis*

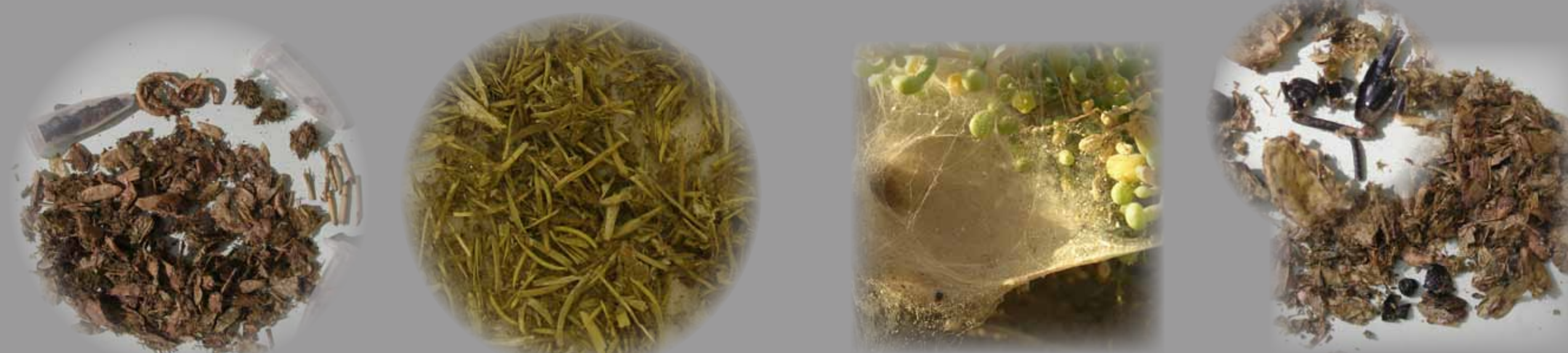
Aurora M Castilla^{1,2}, Renee Richer³, Anthony Herrel⁴, April Conkey⁵, John Tribuna^{6,7}, Mohamed Al-Thani³, Rita Chan⁸

¹ Forest Technology Centre of Catalonia, Spain; ² National Museum of Natural Sciences (CSIC), Spain; ³ Weill Cornell Medical College, Qatar; ⁴ National Museum of Natural History (CNRS), France; ⁵ Carnegie Mellon University, Qatar; ⁶ Qatar University; ⁷ Qatar Natural History Group; ⁸ Qatar Veterinary Centre.

*Optimal Foraging Theory predicts flexibility in feeding behaviour because this may help species to survive in harsh environments where food resources are scarce and unpredictable in space and time. In this study we explored the hypothesis that the herbivorous spiny tailed agamid lizard, *Uromastyx aegyptia microlepis*, may behave as an omnivorous species under conditions of limited food availability. We examined the diet of this species based on the content of faecal pellets collected in the field.*



We conducted our study in the desert of Al-Kharara (south Qatar) during spring 2010, where potential food competitors (camels, *Camelus dromedaries*) are present.



Most faeces (84%) contained remains of wild plants. Grains of barley (*Hordeum vulgare*) were also present, suggesting that dhubs can benefit from the food provided to livestock.

Spider webs were also found in the faeces

Invertebrate remains from *Coleoptera*, *Hymenoptera*, *Lepidoptera*, and *Arachnida* were found in 13% of the faeces

CONCLUSIONS

1. We describe the diet of the spiny tailed lizard in Qatar and provide the first evidence of scavenging behaviour for the spiny tailed lizard worldwide.

2. We find significant differences in faecal composition between study sites suggesting geographic variation in diet and scavenging behaviour.

4. Our findings have important implications for the management and conservation of the spiny tailed lizard populations:

a) Under extreme food limitation the scavenging behavior of these animals could be exploited by the provisioning of carcasses near dhub colonies.

b) Dhub colonies near camel farms could benefit from provisioning with barley

c) The capture of dhubs by Muslims as food could be reduced through programs of social awareness. Muslims believe that dhubs are strictly "vegetarian", and if they were proven to be partially carnivorous or scavengers, they should not be consumed.

d) Dhubs are captured as sport and sold in markets in Arab countries. Because the dhub is a significant part of the local environment and all of God's creation, the Qur'an could be used to promote conservation as suggested by the Islamic Foundation for Ecology and Environmental Sciences (IFEES).



The spiny tailed agamid lizard (dhub in Arab) lives in dry desert areas



The tradition of consuming dhubs is widespread in Arab countries, and their meat is considered a delicacy.



Dhub faeces are very easy to recognize and collect in the field

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Table 1. We found significant differences between zones in the occurrence of plant remains in the faeces ($X^2 = 110$; d.f. = 5; $P < 0.001$).

Plant species	Zone 1 (N = 159)		Zone 2 (N = 135)	
	n	%	n	%
<i>Savignya parviflora</i>	112	70	16	12
<i>Astragalus eremophilus</i>	30	19	2	2
<i>Medicago laciniata</i>	8	5	4	3
<i>Dipcadi erythraeum</i>	2	1	14	10
Only hard stems	0	0	22	16
<i>Hordeum vulgare</i>	5	3	0	0

<i>S. parviflora</i>	<i>A. eremophilus</i>	<i>M. laciniata</i>	<i>D. erythraeum</i>

Table 2. We found significant differences between zones in the occurrence of invertebrate and vertebrate remains ($X^2 = 13$; d.f. = 1; $P < 0.001$)

	Zone 1 (N = 159)		Zone 2 (N = 135)		Total (N = 294)	
	n	%	n	%	n	%
Invertebrates						
<i>Coleoptera</i>	20	13	9	7	29	10
<i>Lepidoptera</i>	1	0.6	1	0.7	2	0.7
<i>Hymenoptera</i>	1	0.6	2	1.5	3	1
<i>Hymenoptera</i>	1	0.6	0	0	1	0.3
<i>Arachnida</i>	1	0.6	3	2	3	1
Total	24	15	15	11	39	13
Vertebrates						
Dhub moul	0	0	2	1.5	2	0.7
Lizard skin	0	0	3	2.2	3	1
Mammal hear	0	0	2	1.5	2	0.7
Phalange	0	0	1	0.7	1	0.3
Flat bones	0	0	2	1.5	2	0.7
Tubular bone	0	0	1	0.7	1	0.3
Total	0	0	11	7	11	4

Fig. 1. Some vertebrate remains found in the faecal pellets



Carcasses near roads are usually detected by scavengers much faster than those far from roads. Dhubs appear to take the advantage of the novel food resources provided by roads.