Preliminary data about the environmental reconstruction of the latest Pleistocene from Kaldar Cave (Khorramabad valley, Iran) through the small-vertebrates assemblages

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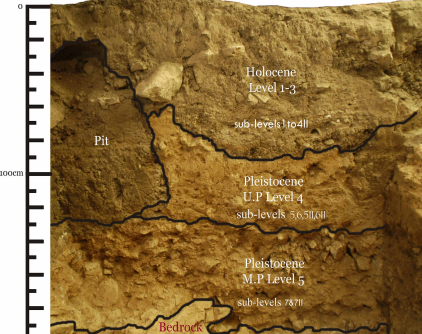E-mail address: ivanreyrguez@gmail.com

The Site

Kaldar Cave is located in the northern part of the Khorramabad valley (Iran, Central Zagros) at 1290 meters a.s.l. The site has a Pleistocene and Holocene occupations (Bazgir et al 2014).
 The 2014-2015 excavated trench exposed an approximately 2m (1.95cm) section of the sedimentary deposit and is characterized by 5 main levels:
-Levels 1 to 3 (including sub-levels 4 & 4II) consist of ashy sediment with a blackish green color containing both thick and lean angular stones. It varies in thickness from 60 to 90 cm and contains many phases of the Holocene time, more specifically materials from Islamic era, historical, Bronze Age, Iron Age, Chalcolithic and Neolithic.
- Level 4 (including sub-levels 5, 5II, 6 & 6II) consists of a fine but dense sediment in dark-brown color. In this level, its archaeological content shows mostly Upper Paleolithic features with presence of some fractured flints and debitages in the upper part of the sequence.
- Level 5 (including sub-levels 7&7II) encompasses an extremely dense sediment in reddish-brown color with presence of some small angular blocks and contain an outstanding Middle Paleolithic artifacts.

A1 and A2. Selected artifacts from Kaldar KLD level 5 and 4. 1: Distal portion of a fragmented Mousterian point on a Levallois blank, 2: point on a Levallois flake with dihedral platform, 3: Levallois point with flat platform, recurrent unidirectional convergent, 4: side-scraper on cortical blade with faceted platform and unidirectional convergent negatives, 5: predetermining Levallois flake with four convergent negatives, flat platform, 6: Levallois point on core-edge flake with flat platform, 7: semi-cortical flake with flat platform and presence of unidirectional negatives, 8: Levallois point with dihedral platform obtained by the recurrent unidirectional modality, 9: pointed flake on Levallois core, 10: twisted bladelet with flat platform, 11: flake of re-shaping the knapping surface, 12: bladelet core, 13: fragmented bladelet core with four negatives.

1: KLD-DS-5 + KLD-1—right lower canine of a male Sus scrofa from Kaldar Cave; lingual view; 2: GLV-A1-17-enamel fragment of a cheek tooth of a rhinoceros (?) from Gilvaran Cave; (a) buccal view, and (b) section; 3: KLD-11 – tip of the tine of an antler of Cervidae indet. cf. Cervus elaphus; (a) anterior/posterior, (b) lateral/medial, (c) anterior/posterior, and (d) lateral/medial views, and (e) section; 4: GLV-A8-103—fragment of a lumbar vertebra of Cervidae indet. cf. Cervus elaphus from Gilvaran Cave; posterior view; 5: KLD-9—fragment of the pincer of a crab from Kaldar Cave; (a) distal section, (b) mesial view, (c) occlusal view, (d) lateral view, (e) inferior (?) view, and (f) proximal section; 6: GHM-F2-8—right P2 of Bovini indet. from Ghamari Cave; (a) occlusal, (b) buccal, and (c) lingual views; 7: KLD-14—first phalanx right of the axis of the hand (?) of Capreolus from Kaldar Cave; (a) distal, (b) proximal, (c) axial, (d) dorsal, (e) abaxial, and (f) plantar views. 8: GHM-F2-22 – axis of Hystrix from Ghamari; (a) anterior, (b) posterior, (c) right, (d) dorsal, and (e) ventral views; 9: KLD-10 – left M1/2 (M1?) of Capra from Kaldar Cave; (a) buccal, (b) occlusal, and (c) lingual views. The scale bars represent 1.5 cm for photographs 2 and 5 and represents 3 cm for the remaining photographs

Material and methods

The small-vertebrate fossil remains used in this study comes from the archeo-paleontological excavation campaigns carried out in Kaldar Cave in 2014. Disarticulated bones compose the sample and also isolated teeth that were collected by water screened using superimposed 5 and 0.5 mm mesh screens.
Dental morphological nomenclature of murines is after Vandebroek (1961–1962), that of arvicolines after van der Meulen (1973).

1)*Apodemus* cf. *flavicollis*; 2) *Chionomys* cf. *nivalis*; 3) *Cricetulus* cf. *migratorius*; 4) *Ellobius* cf. *lutescens*; 5) *Ellobius* cf. *talpinus*; 6)*Meriones* sp.;7) *Microtus* gr. *socialis*; 8) *Mus* cf. *musculus*. Scale 0.5mm
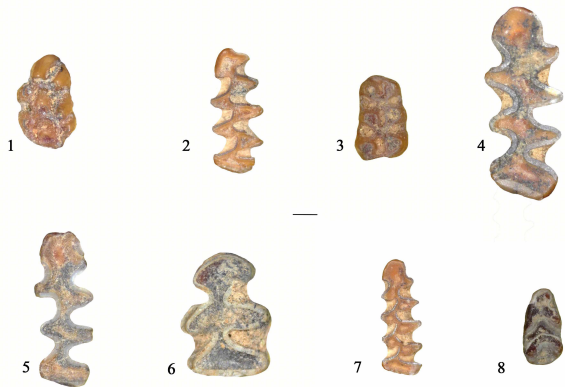
Results

The preliminary study of the small vertebrates from this locality allows us to identify 72 remains coming from levels 4 (Holocene) and 5II (Upper-Pleistocene).
The small mammals assemblage of Kaldar cave is composed of five arvicolinae, two cricetinae, one gerbidae and two murinae taxa. Due to needs for more samples, the recovered small vertebrates from level 4 do not allow us to interpret the palaeoenvironment. While the Late Pleistocene level 5II has enough sample for that.
The preliminary taphonomical analysis, regarding the digested elements, suggests that the main hypothesis for the accumulation is the predation activity, probably a category 3 predator, as *Strix aluco* or *Bubo Bubo*

	Level 4			Level 5		
	NISP	MNI	%	NISP	MNI	%
Microtus gr. *socialis*	3	2	33.33	28	14	41.18
Chionomys cf. *nivalis*	1	1	16.67	1	1	2.94
Ellobius cf. *lutescens*	1	1	16.68	0	0	0.00
Ellobius cf. *talpinus*	0	0	0.00	1	1	2.94
Ellobius sp.	0	0	0.00	2	2	5.88
Cricetulus cf. *migratorius*	1	1	16.67	5	3	8.82
Mesocricetus cf. *brandti*	0	0	0.00	5	2	5.88
Meriones sp.	3	1	16.67	16	7	20.59
Apodemus cf. *flavicollis*	0	0	0.00	4	3	8.82
Mus cf. *musculus*	0	0	0.00	1	1	2.94
Total	**9**	**6**	**100**	**63**	**34**	**100**

In addition to the small mammals level 5 delivered 25 remains of the following squamate reptiles and amphibians: an agamid lizard (Agamidae indet.), a lizard (Lacertidae indet.), a sand boa (*Eryx* sp.; Boidae); a viper (Viperidae indet.) and a toad (*Bufo* sp.).

Conclusion

The rodents assemblage indicates an environment surrounding the cave, mainly composed by open dry meadows, indicated by the most abundant taxa, *Microtus* gr. *socialis* and *Meriones* spp. Together with these taxa, the identified murinae species indicate the presence of a certain vegetation cover. Also, amphibians and squamate reptiles fossil remains have been recovered, and the identified taxa indicates rocky or sandy environments linked with warm arid areas

Acknowledgments

References

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Kaldar Cave; General View from West (Photo B.Bazgir)

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