The Middle Pleistocene fossil avifauna from the "*Elephas mnaidriensis* Faunal Complex" of Sicily (Italy): preliminary results

M. Pavia

Dipartimento di Scienze della Terra, Università degli Studi di Torino, Torino, Italy
pavia@dst.unito.it

SUMMARY: Preliminary results of the analysis of fossil bird remains from the late Middle Pleistocene-early Late Pleistocene localities of Sicily referred to the "*Elephas mnaidriensis* Faunal Complex" are presented. Several Sicilian sites have yielded fossil vertebrates attributed to this Faunal Complex, but the bird remains analysed in this paper came from only three localities: K-22 (S. Vito lo Capo, north-western Sicily), Acquedolci (northern Sicily) and Contrada Fusco (Siracusa, south-eastern Sicily). Preliminary results show the presence of fifty taxa, three of them extinct: *Gyps melitensis, Cygnus falconeri* and *Grus* cf. *G. melitensis*, the latter two endemic to Sicily and Malta. The fossil bird associations allow us to confirm the insular characteristics of the "*Elephas mnaidriensis* Faunal Complex", already suspected from the analysis of other fossil vertebrates.

1. Introduction

During the last two centuries, many Sicilian localities with fossil vertebrate assemblages have been found and excavated (Bonfiglio & Burgio 1992). Based on palaeontological analysis, the Pleistocene vertebrates have been arranged into five faunal complexes: the "Monte Pellegrino Faunal Complex" of the Early Pleistocene, the "*Elephas falconeri* F. C." of the early Middle Pleistocene, the "*Elephas mnaidriensis* F.C." of the late Middle Pleistocene-early Late Pleistocene, and the "Pianetti-S. Teodoro F.C." and "Castello F. C." of the Late Pleistocene (Bonfiglio *et al.* 2001). Four of these include mainly endemic fossil mammals, like the pigmy *Elephas falconeri* and the giant glirid *Leithia melitensis* of the "*Elephas falconeri* F. C."; and the dwarf, if less reduced in size *Elephas mnaidriensis* and the pygmy *Hippopotamus pentlandi* of the "*Elephas mnaidriensis* F. C."; plus reptiles and amphibians. The fifth, dating from the latest Pleistocene, contains extant continental species accompanied by Palaeolithic artefacts (Bonfiglio *et al.* 1997, Di Maggio *et al.* 1999). Fossil bird remains were found in each faunal complex (Bonfiglio & Insacco 1992, Bonfiglio *et al.* 1997), except in the oldest one, the "Monte Pellegrino Faunal Complex" which contains only small mammals and reptiles (Burgio & Fiore 1997).

Vertebrate remains of the "*Elephas mnaidriensis* Faunal Complex" have been found in several Sicilian localities (Bonfiglio & Burgio 1992, Mangano & Bonfiglio 1998), which contain essentially macromammals. At the present time the "*Elephas mnaidriensis* F. C." is characterised by the following taxa: *Discoglossus* cf. *D. pictus, Testudo hermanni, Emys orbicularis, Lacerta siculimelitensis, Natrix* sp., Aves, *Leithia* ex gr. *melitensis-cartei, Maltamys wiedincitensis, Crocidura esuae, Crocuta crocuta spelaea, Panthera leo spelaea, Canis lupus, Lutra trinacriae, Ursus arctos, Elephas antiquus leonardii, Elephas mnaidriensis, Sus scrofa, Hippopotamus pentlandi, Cervus elaphus siciliae, Dama carburangelensis, Bos primigenius siciliae* and *Bison priscus siciliae* (Abbazzi *et al.* 2001, Bonfiglio

et al. 1997, Di Maggio *et al.* 1999). The bird remains are still undescribed, apart for a preliminary analysis of few remains from the "*Elephas mnaidriensis* F.C." locality of Contrada Fusco (Basile & Chilardi 1996) made by Cassoli & Tagliacozzo (1996).

In this paper the preliminary results of a recent analysis on the fossil birds of Sicily are presented, in particular those of the "*Elephas mnaidriensis* F.C." (Pavia 2000).

2. Results

The fossil remains analysed here come from three Sicilian localities (Fig. 1): K22, a fissure filling exposed in an abandoned quarry in the S. Vito Lo Capo peninsula, North-western Sicily (Di Maggio *et al.* 1999), which yielded some bird remains from the levels attributed to the "*Elephas mnaidriensis* F. C."; Acquedolci, a lacustrine deposit located in Northern Sicily with very rich vertebrate remains dominated by *Hippopotamus pentlandi* (Bonfiglio 1995), from which only a proximal ulna of *Gyps melitensis* has been found; and Contrada Fusco, a lacustrine deposit outcropping in the suburbs of Siracusa (Basile & Chilardi 1996), in which hundreds of bird remains have been collected, the study of which is still in progress (Pavia & Chilardi, in prep.).

Preliminary palaeontological analysis of the fossil bird remains of these localities allows me to indicate the bird taxa of the "*Elephas mnaidriensis* Faunal Complex" as follows (the † indicates the extinct taxa):

Tachybaptus ruficollis
Podiceps cristatus
Podiceps auritus
Phalacrocorax carbo
Pelecanus crispus
Ixobrychus minutus
Botaurus stellaris
Egretta garzetta
Ardea cinerea
Plegadis falcinellus
Cygnus falconeri (†)
Anser sp.
Branta sp.
Tadorna tadorna
Anas crecca/querquedula
Anas platyrhynchos
Anas clypeata
Anas sp.
Aythya sp.
Mergus merganser
Oxyura leucocephala
Buteo buteo
Gyps melitensis (†)
Accipiter gentilis
Accipiter nisus
Aquila sp.
Pandion haliaetus
Falco columbarius
Coturnix coturnix
Fulica atra
Grus grus
Grus cf. *G. melitensis* (†)
Tetrax tetrax
Otis tarda
Limosa limosa/lapponica
Numenius cf. *N. phaeopus*
Scolopax rusticola
Tringa sp.
Pterocles orientalis
Columba livia/oenas
Bubo bubo
Strix aluco
Athene noctua
Tachymarptis melba
Coracias garrulus
Anthus sp.
Erithacus rubecula
Turdus sp.
Sylvia sp.
Sturnus unicolor/vulgaris
Corvus corone

3. Conclusions

Palaeontological analysis of the fossil bird remains of the "*Elephas mnaidriensis* Faunal Complex" reveals the presence of at least fifty taxa, three of them extinct: *Gyps melitensis, Cygnus falconeri* and *Grus* cf. *G. melitensis*, the latter two endemic of Sicily and Malta.

The findings of *Cygnus falconeri* at Contrada Fusco represent the first report of this taxon

outside the Maltese Archipelago. This species was described by Parker (1865, 1869) from cave deposits in Malta in which dwarf elephants and endemic Gliridae of the genera Leithia and Maltamys were also found (Northcote 1982). The Sicilian remains of *Cygnus falconeri*, together with the remains of *Cygnus equitum* and *Grus melitensis* from other Sicilian localities (Pavia 2000), confirm the affinities between the Maltese vertebrate faunas and the Sicilian ones, as indicated by Kotsakis (1986) based on the analysis of other vertebrate remains. In fact some endemic vertebrates have been reported from both Sicily and Malta, such as *Elephas falconeri, E. mnaidriensis, Leithia melitensis, Maltamys wiedincitensis* and *Lacerta siculimelitensis* (Caloi *et al.* 1988).

The fossil avifauna of the "*Elephas mnaidriensis* Faunal Complex" shows the typical features of insular avifaunas, as described by Alcover *et al.* (1992): (a) the presence of endemic forms, *Cygnus falconeri* and *Grus* cf. G. *melitensis*, (b) the absence of Galliforms, with the exception of the migrating *Coturnix coturnix*, and (c) the absence of species of the genus *Passer*. In the "*Elephas mnaidriensis* F. C." three species of Strigiforms are reported: S*trix aluco, Bubo bubo* and *Athene noctua*; all are continental species and the latter two partially substitute two endemic Strigiforms that inhabited Sicily during the Middle Pleistocene and are found in the localities of the "*Elephas falconeri* Faunal Complex" (Pavia 1999, 2000; Pavia & Mourer-Chauviré 2000). The avifauna of the Middle Pleistocene-Late Pleistocene "*Elephas mnaidriensis* Faunal Complex" of Sicily, even if it maintains the insular characteristics, shows a reduction of the degree of isolation, testified by the decrease in endemic forms and the arrival of new continental forms, like the Strigiforms and the big scavenger *Gyps melitensis*, that probably followed the colonisation of Sicily by the large mammals typical of the "*Elephas mnaidriensis* Faunal Complex". The reduction of the degree of isolation is also evident in the mammal fauna, testified among others by the extinction of the dwarf *Elephas falconeri* and its replacement by the less size-reduced *E. mnaidriensis*, and the occurrence of some large mammal taxa, slightly modified compared to their continental ancestor, such as *Bos primgenius siciliae* an *Cervus elaphus siciliae*. The completion of the analysis of the bird remains will allow us to appraise the structure of the association and its relationship to the other Sicilian FC and to the mainland avifaunas. Finally, a comparative analysis of the Sicilian fossil bird associations and the Maltese ones will allow us to clarify the similarities between the two islands and their vertebrate faunas.

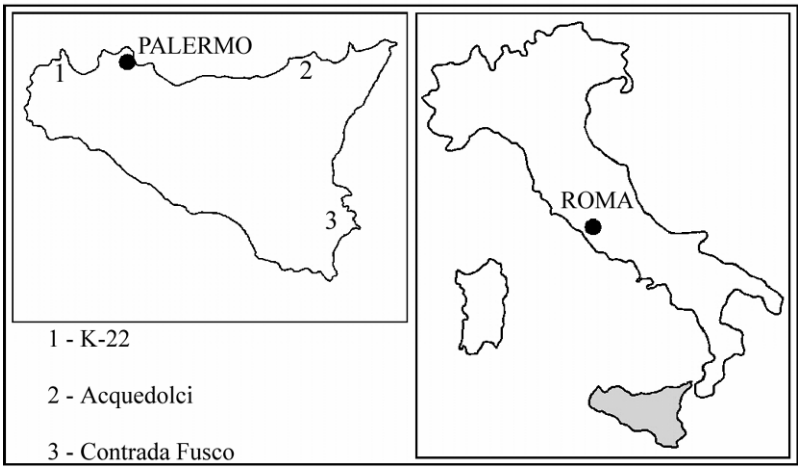

Fig.1 - Map of Sicily with the localities cited in the text.

4. ACKNOWLEDGEMENTS

I would like to thanks the people who gave me the opportunity to study the fossil bones, in particular Prof. L. Bonfiglio for the Acquedolci material, Prof. F. Masini for the K-22 material, and B. Basile, S. Chilardi and A. Tagliacozzo for the Contrada Fusco material.

This work was supported by grants MURST COFIN 1999 "Paleobiografia del Mediterraneo Centrale dal Miocene al Quaternario" to Prof. Laura Bonfiglio.

5. REFERENCES

Abbazzi, L., Bonfiglio, L., Marra, A.C. & Masini, F. 2001. A revision of medium and small sized deer from the Middle and Late Pleistocene of Calabria and Sicily. In Rook L. & Torre D. (eds.), Neogene and Quaternary continental stratigraphy and mammal evolution. Papers in honour of Prof. Augusto Azzaroli's outstanding contribution in Geology and Palaeontology. *Bollettino Società Paleontologica Italiana* 40 (2): 115-126.

Alcover, J.A., Florit, F., Mourer-Chauviré, C. & Weesie, P.D.M. 1992. The avifaunas of the isolated Mediterranean islands during the Middle and Late Pleistocene. *Science Series Natural History Museum Los Angeles County* 36: 273-283.

Basile, B. & Chilardi, S. (eds.) 1996. *Siracusa, le ossa dei giganti, lo scavo paleontologico di Contrada Fusco*. Siracusa: Arnaldo Lombardi.

Bonfiglio, L. 1995. Taphonomy and depositional setting of Pleistocene mammal-bearing deposits from Acquedolci (North-Eastern Sicily). *Geobios M.S.* 18: 57-68.

Bonfiglio, L. & Burgio, E. 1992. Significato paleoambientale e cronologico delle mammalofaune pleistoceniche della Sicilia in relazione all'evoluzione paleogeografica. *Il Quaternario* 5 (2): 223-234.

Bonfiglio, L. & Insacco, G. 1992. Palaeoenvironmental, palaeontologic and stratigraphic significance of vertebrate remains in Pleistocene limnic and alluvial deposits from southeastern Sicily. *Palaeogeogreography, Palaeoclimatology, Palaeoecology* 95: 195-208.

Bonfiglio, L., Insacco, G., Marra, A.C. & Masini, F. 1997. Large and small mammals, amphibians and reptiles from a new late Pleistocene fissure filling deposit of the Hyblean Plateau (South Eastern Sicily). *Bollettino Società Paleontologica Italiana* 36 (1-2): 97-122.

Bonfiglio, L., Mangano, G., Marra, A.C. & Masini, F. 2001. A new Late Pleistocene vertebrate faunal complex from Sicily (S. Teodoro Cave, North-Eastern Sicily, Italy). In Rook L. & Torre D. (eds.), Neogene and Quaternary continental stratigraphy and mammal evolution. Papers in honour of Prof. Augusto Azzaroli's outstanding contribution in Geology and Palaeontology. *Bollettino Società Paleontologica Italiana* 40 (2): 149-158.

Burgio, E. & Fiore, M. 1997. Mustelercta arzilla (De Gregorio, 1886) elemento villafranchiano nella fauna di Monte Pellegrino (Palermo, Sicilia). *Il Quaternario* 10 (1): 65-74.

Caloi, L., Kotsakis, T. & Palombo, M.R. 1988. La fauna a vertebrati terrestri del Pleistocene delle isole del Mediterraneo. *Geologica Romana* 25 (1986): 235-256.

Cassoli, P.F. & Tagliacozzo, A. 1996. L'Avifauna. In B. Basile & S. Chilardi (eds.), *Siracusa, le ossa dei giganti, lo scavo paleontologico di Contrada Fusco*: 61-67. Siracusa: Arnaldo Lombardi.

Di Maggio, C., Incandela, A., Masini, F., Petruso, D., Renda, P., Simonelli, C. & Boschian, G. 1999. Oscillazioni eustatiche, biocronologia dei depositi continentali quaternari e neotettonica nella Sicilia Nord-occidentale (Penisola di S. Vito Lo Capo – Trapani). *Il Quaternario* 12 (1): 25-49.

Kotsakis, T. 1986. Vertebrati insulari e paleogeografia: alcuni esempi. *Bolletino Società Paleontologica Italiana* 24 (2-3): 225-244.

Mangano, G. & Bonfiglio, L. 1998. I depositi a vertebrati continentali del Pleistocene della Sicilia orientale. *Naturalista siciliano*, S.

IV, 22 (3-4): 405-432.

Northcote, E.M. 1982. Size, form and habit of the extinct Maltese Swan *Cygnus falconeri. Ibis* 124: 148-159.

Parker, W.K. 1865. Preliminary note on some fossil birds from the Zebbug Cave, Malta. *Zoological Society of London Proceedings* 1865: 752-753.

Parker, W.K. 1869. On some fossil birds from the Zebbug Cave, Malta. *Transactions Zoological Society of London* 6: 119-124.

Pavia, M. 1999. The Middle Pleistocene Avifauna of Spinagallo Cave (Sicily, Italy): Preliminary report. In S.L. Olson (ed.), Avian Paleontology at the Close of the 20th Century: Proceedings of the 4th International Meeting of the Society of Avian Palaeontology and Evolution, Washington, D.C., 4-7 June 1996. *Smithsonian Contribution to Paleobiology* 89: 125-127.

Pavia, M. 2000. *Le avifaune pleistoceniche dell'Italia meridionale*. Unpublished PhD Thesis, University of Torino: 147 pp.

Pavia, M. & Mourer-Chauviré, C. 2000. An overwiev on the genus Athene in the Pleistocene Mediterranean Islands with the description of a new species (Aves, Strigiformes). *Vertebrata Palasiatica* 38 (Supplement): 24-25.