Update Middle Pleistocene fossil birds data from Quartaccio quarry (Vitinia, Roma, Italy)

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SUMMARY: The Middle Pleistocene fossil birds from the Vitina Formation (Quartaccio quarry, Vitinia, Roma) have been revised and 12 taxa have been identified: *Podiceps grisegena, Ardea purpurea, Anser* sp., *Branta ruficollis, Anas platyrhinchos, Anas clypeata, Somateria mollissima, Mergus serrator, Fulica atra, Gallinago* sp., *Sturnus vulgaris, Pyrrhula pyrrhula*. This revision of the fossil material allows to modify the faunal list pointed out in previous works: for example, the occurrence at Quartaccio quarry of *Branta ruficollis, Anas clypeata, Somateria mollissima, Mergus serrator, Sturnus vulgaris, Pyrrhula pyrrhula* have been checked while the occurrence of *Podiceps cristatus, Anser* cfr. *albifrons, Anser* cfr. *erythropus, Anser* cfr. *fabalis, Anas penelope, Aythya ferina, Turdus iliacus, Carduelis chloris* cannot be confirmed.

1. Introduction

The fossil birds assemblage from Quartaccio quarry (Vitinia, Roma) (Fig. 1) have been taken into account in order to update the systematic of the avifauna.

The sediments outcrop in the Quartaccio quarry can be divided into 4 Formations: Ponte Galeria Fm., San Cosimato Fm., Aurelia Fm. and Vitinia Fm. The Pleistocene deposits and the vertebrate remains coming from the Vitinia Formation have been studied by several authors (Conato *et al.* 1980, Caloi *et al.* 1983, 1998). In particular, the vertebrate fauna, including the

Fig.1 - Location of Quartaccio quarry (Vitinia, Roma).

bird bones, come from reddish-brown lacustrine clays, interbedded by cross stratified sands and tufitic levels (Level e2) (Fig. 2). The faunal association includes: Ciprinidae, Esocidae, *Rana* sp., *Bufo viridis, Emys orbicularis, Testudo hermanni, Podiceps cristatus, Anser* cfr. *albifrons, Anser* cfr. *erythropus, Anser* cfr. *fabalis, Anas platyrhinchos, Anas penelope, Aythya ferina, Fulica atra, Gallinago gallinago, Turdus iliacus, Carduelis chloris, Arvicola* sp., *Canis lupus, Elephas (Palaeoloxodon) antiquus, Stephanorhinus hemitoechus, Dama dama tiberina, Cervus elaphus, Bos primigenius* (Caloi *et al.* 1983, 1998; Di Stefano & Petronio 1997). The faunal assemblage can be referred to the Middle Pleistocene Vitinia Faunal Unit (Gliozzi *et al.* 1997).

2. Systematic

The revision of the fossil material allows to identify the following taxa:

Order Podicipediformes
  Family Podicipidae
    Podiceps grisegena (Boddaert 1783)
Order Ciconiformes
  Family Ardeidae
    Ardea purpurea Linnaeus, 1766
Order Anseriformes
  Family Anatidae
    Anser sp.
    Branta ruficollis (Pallas 1769)
    Anas platyrhinchos Linnaeus, 1758
    Anas clypeata Linnaeus, 1758
    Somateria mollissima Linnaeus, 1758
    Mergus serrator Linnaeus, 1758
Order Gruiformes
  Family Rallidae
    Fulica atra Linnaeus, 1758
Order Charadriiformes
  Family Scolopacidae
    Gallinago sp.
Order Passeriformes
  Family Sturnidae
    Sturnus vulgaris Linnaeus, 1758
  Family Fringillidae
    Pyrrhula pyrrhula (Linnaeus 1758)

Order Podicipediformes
  Family Podicipidae
Podiceps grisegena
1 femur

This bone have been compared with those of *Podiceps grisegena* and *Podiceps cristatus*. The two species differs in the shape of impressions of the *crista femoralis*; the first species shows an irregular impression, nearer to the crista than

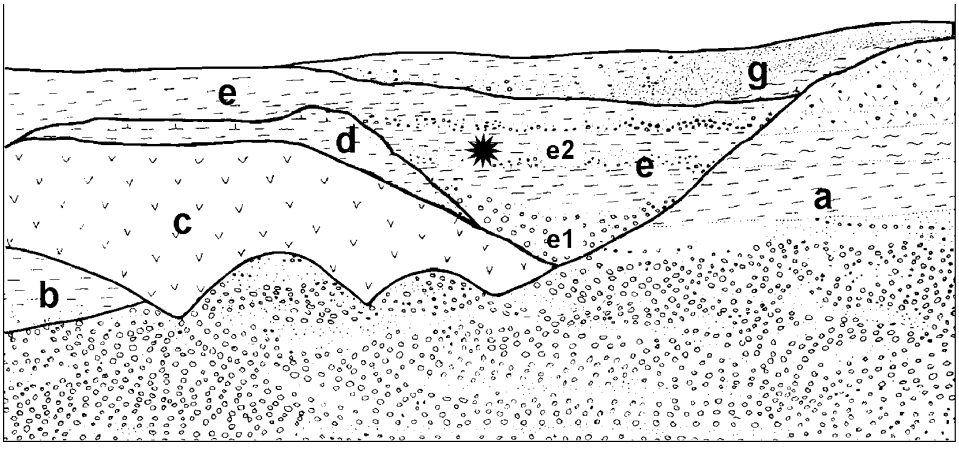

Fig.2 - Stratigraphical sketch of Quartaccio quarry (Vitinia, Roma): a) Ponte Galeria Formation; b) S. Cosimato Formation; c) "Tufo litoide lionato"; d) Aurelia Formation; e) Vitinia Formation: e_1 cross bedded gravels and sands, e_2 reddish-brown lacustrine clays, interbedded by cross stratified sands and tufitic levels (Modified from Caloi *et al.* 1983). * Fossiliferous level.

in *P. cristatus*, which has a more regular impression; besides, *P. grisigena* in the proximal part has a longer and higher line. This characteristic allows to separate *P. grisegena* from *P. cristatus*, as also pointed out by Bochenski (1994).

Ordine Ciconoformes
Family Ardeidae
Ardea purpurea
1 femur

The features of this bone are typical of the family Ardeidae; the size of the specimen considered is near to *Ardea purpurea* and *Casmerodius albus*. The distal part is thin and long and the *facies articularis acetabularis* is small and thin; the crista trochanteris is prominent. These morphological characteristics are typical of *Ardea purpurea*.

Ordine Anseriformes
Family Anatidae
Branta ruficollis
1 humerus

This bone is fragmentary, but its features is comparable with two genera *Branta* and *Anser*. The impressio muscoli inferioris is slightly deep and this is a typical features of genere *Branta*; for its size the specimen can be referred to *Branta ruficollis*.

Anas platyrhinchos
1 coracoid, 1 humerus

This duck is represented by a distal part of a humerus and a coracoid. The humerus has features that can be recognised in to two different species, *Tadorna tadorna* and *Anas platyrhinchos*; the impression in the fossa brachialis is curved and thin and the *epicondylus ventralis* has regular lips. In the coracoid the facies articularis humeralis is circular and the *cotyla scapolaris* has regular lips. The central part of the bone is slender and thin. The facies articularis sternalis is high and slightly deep. These features allow to refer these bones to *A. platyrhinchos*.

Anas clypeata
1 carpometacarpus, 1 ulna

These bones show a morphology very similar to the living species *Anas clypeata*. The carpomeatcarpus has a prossimal part characterised by a *processus extensorius* and a *processus pisiformis* less prominent than in the *Anas penelope*, which has approximately the same size. In the distal part, the *os carpalis minus* is more prominent than the *os carpalis majus* and the intersection between these is prominent too. In the ulna the *facies articularis* is lowered and the olecranon is shifted toward the external side.

Somateria mollissima
1 ulna

The features of the *impressio brachialis* of this ulna is in agreement with the genus *Somateria*. The size is near to *Somateria mollissima*.

Mergus serrator
1 humerus

This bone is characterised by a long body and a thin epiphysis like in the genus *Mergus*. The size is near the range of the species *Mergus serrator*, smaller than *M. merganser* and bigger than *M. albellus*.

Ordine Gruiformes
Family Rallidae
Fulica atra
1 femur, 1 tarsometatarsus

The features of these bones are near to those of the living *Fulica atra*. The proximal part of the femur is characterised by a prominent *crista trochanteris*. The tarsometatarsus shows a *cotyla medialis* with a circular lips, a typical oblique line links the epiphisis to the central part of the diaphisys. In the distal part the *fossa metatarsi* I is quite shallow .

Gallinago sp.
1 ulna

The genus *Gallinago* is characterised by an ulna with *cotyla dorsalis* more expanded and prominent than in the genera *Tringa* and *Calidris*, the closest forms for morphological features. Moreover there is a impression which is absent in the other two genera. The olecranon is high in the posterior part. The genus *Gallinago* includes two species, *G. gallinago*

and *G. media*; a more detailed taxonomical analysis is still in progress.

Order Passeriformes

Family Sturnidae

Sturnus vulgaris

1 humerus, 2 carpometacarpi, 1 tibiotarsus

In its proximal end, the humerus shows two hollows separated by a median bar; this feature is typical of two genera, *Sturnus* and *Pinicola* (Janossy 1983). This bone has morphological features close to those of *Sturnus*, with a thin epiphisis and a very prominent *caput humeri*. The genus *Sturnus* includes two species differing mainly for their size: *S. vulgaris* showing an epiphysis larger than the second species, *S. roseus*. In the carpometacarpus the *processus extensorius* is less prominent than in the similar genus Turdus, while the *fovea caudalis* is more prominent. The *os carpalis minus* is slightly curved and parallel to the os carpalis majus. In the distal part, the *sulcus interossos* is shallow. The tibiotarsus is characterised by an *area interarticularis* very marked and a *crista patellaris* with no introflexion. The distal epiphysis is small and of regular shape.

Family Fringillidae

Pyrrhula pyrrhula

1 humerus

The small size of this bone (smaller than 20 mm) and the presence of two deep hollows are typical of the family Fringillidae. The features is near to genus *Pyrrula*, which differs from the other taxa of Fringillidae in having a median bar shifted toward the frontal side of the bone and wider (Janossy 1983).

3. Conclusions

The systematic analysis has detected the occurence of 12 taxa belonging to 11 genera. Respect the list presented in previous works (Caloi *et al.* 1983, 1998) the revised faunal list differs in some elements: *Podiceps grisegena, Branta ruficollis, Anas clypeata, Somateria mollissima, Mergus serrator, Pyrrhula pyrrhula, Sturnus vulgaris* have not been checked before; on the contrary the occurrence of *Podiceps cristatus, Anser* cfr. *A. albifrons, Anser* cfr. A. *erythropus, Anser* cfr. *A. fabalis, Anas penelope, Aythya ferina, Turdus iliacus, Carduelis chloris* is not confirmed.

The avifauna of Quartaccio quarry includes uncommon taxa for the Pleistocene deposits. For example the remain of *Somateria mollissima* represents the oldest record of the species and the first for Italian deposits (Tyrberg 1998). Moreover, *Podiceps* aff. *P. grisegena* was found in Italy previously only in the Late Pleistocene deposit of Colombi Cave (Liguria) (Tyrberg 1998) and the specimen from the Vitinia Formation can be considered the first occurrence of this species until now.

Taking into account the revised data, updated palaeoecological considerations on the Vitinia avifauna can be pointed out. Almost all the represented taxa can be related with humid palaeoenvironmental conditions. Moreover, the occurrence of *Pyrrhula pyrrhula*, a short range migrant, is linked to the presence of forests (Cramp & Perrins 1994), probably covering the slopes of the basin.

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