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Gli effetti delle variazioni climatiche pleistoceniche sulla dinamica
dei popolamenti animali e vegetali nella Penisola italiana

Peafowls (g. *Pavo* Linnaeus, 1758) and Ptarmigans (g. *Lagopus* Brisson, 1760): an unique coexistence in North Bulgaria over 3 m.y. ago

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SUMMARY

The Peafowls of genus *Pavo* are considered as tropical and subtropical inhabitants of the Asian jungle-like forests from the modern ornithogeographical point of view. At the same time the genus *Lagopus* has Holarctic present day distribution in the open country and the broadleaf scub in the Arctic, Alpine and Boreal zones.

Six avian taxa were established in the Pliocene site of Muselievo (43.36 N, 24.50 E) near Danube river, CN Bulgaria, dated MN 15. Among them are the finds of Bravard's Peafowl (*Pavo bravardi* [Gerves, 1849; 1848-1852]), and a humeral fragment of a Ptarmigan (*Lagopus* sp. indet.). Thus, the site provides for the first time from the Early Pliocene of Balkans, an example of the "mixed avifaunas" – a phenomenon well known among the mammalian faunistic complexes of S Europe, which was best represented during the Villafranchian.

INTRODUCTION

Data on fossil and subfossil avifaunas of Bulgaria are poor. A total of 117 taxa of Holocene (Boev, 1996a), 61 of Pleistocene (Boev, 1995) and about 90 of Neogene (at least 8 Miocene and over 80 Pliocene) (Boev, 1996b) were established up to present.

MATERIAL AND METHODS

The material was collected in 1988-1994 by Dr. Vassil Popov, M. Sc. Stefan Stefanov, and by the author. After the excavations, all sediments have been sifted through the screen of 2 mm mesh and floated. The finds have been identified by the comparative avian skeleton collection of the Centre de Sciences de la Terre of the Université Claude Bernard-Lyon. Their morphological descriptions will be presented in special papers (Boev, in press).

THE SITE OF MUSELIEVO AND ITS VERTEBRATE FAUNA

The finds originate from the vicinity of Muselievo village (Lovetch District), Central N Bulgaria (43.36 N, 24.50 E), 10 km from Danube river at about 150 m a.s.l. The site represents a rock shelter in a destroyed Pliocene cave in Turonian limestones (Bonchev et al., 1973) on a hill 350 m from the Ossam river. They are dated by the associated mammals fauna Early Pliocene-2nd half of the middle Ruscinian (MN 15, i.e. 3.3-3.1 M.y. ago) (V. Popov, pers. comm.; Popov, 1996).

At least 11 mammalian taxa were determined: the fossil species *Mimomys occitanus, Pseudomeriones abbreviatus, Rhagapodemus hautimagnensis, Myomimus dehmi, Sus minor and the recent genera (Sciurus, Glis, Apodemus, Rhinolophus, Miniopterus, Dolichopithecus)* (Popov and Delchev, 1997).

The fossil avian material collected in the site includes 20 finds, but they belong at least to 6 avian taxa (Boev, 1996b):

– *Pavo bravardi* (Gerves, 1849): phalanx 2 dig. II pedis, No F 418; phalanx 2 dig. III pedis, No F 419; phalanx 3 dig. IV pedis, F 420; phalanx distalis dig. I pedis, No F 421;

– *Lagopus* sp.: ending of a humerus dex. prox., F 422;

– *Accipiter* cf. *gentilis* (Linnaeus, 1758): humerus dex. dist, F 423;

– *Falco* sp. (ex gr. *tinnunculus* (L., 1758): phalanx dist. dig. pedis, F 424;

– Aves indet. (two undetermined taxa): 6 phalanges digitorum pedis, F 1608-1613; a splinter of carpometacarpus sin., F 1614; 2 splinters of femora/humeri, F 1615; 3 splinters of radii, F 1617-1619.

PALEOZOOGEOGRAPHICAL NOTES

The fossil record of peafowls is very scanty. *Pavo bravardi* (Gerves, 1849) is the only known up to present fossil species of the genus *Pavo*. It is established in 4 localities from France, dated MN 15 to MN 18 (Boev, in press). The paleobotanical analysis of these localities shows the presence of some exotic thermophilous elements whose endemic analogues now are spread in the peripheral parts or out of the Palearctic region. Contrary, the numerous fossil evidences indicate the much wider distribution of g. *Lagopus* in the past (Tyrberg, 1995).

The site of Muselievo provides an example of the so called "mixed faunas" – a phenomenon well known among the mammalian faunistic complexes of SE Europe, which was best represented at the end of Pliocene during the Villafranchian. The southernmost regions of the breeding range of g. *Lagopus* (*L. mutus* Montin, 1776) lie in Central Asia (Pamir Alai Mts in Tadjikistan) of 1,200 km away from the northernmost parts of the range of g. *Pavo* (*Pavo cristatus* L., 1758) in Aravali Mts. in India. All over the world both genera are spread at musch larger distance. Ortnithogeography considers Peafowls of genus *Pavo* as tropical and subtropical inhabitants of the Asian jungle-like forests (del Hoyo et al., 1994). On the other hand,

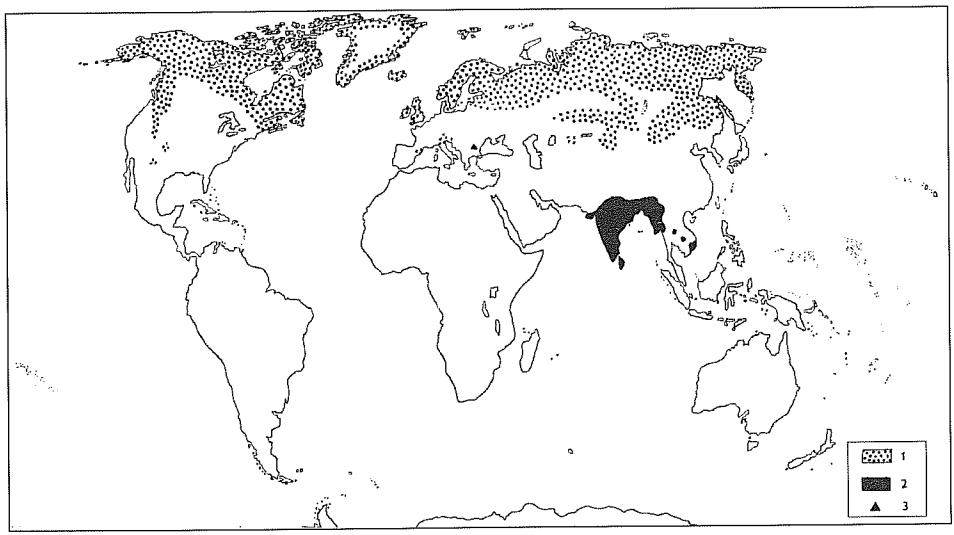

Fig. 1. Recent breeding ranges of g. *Lagopus* (1) and g. *Pavo* (2) (after del Hoyo et al., 1994), and the location of the Pliocene site of Muselievo in N. Bulgaria (3).

the Willow Grouse and Ptarmigans (g. *Lagopus*) have Holarctic present day distribution (Fig. 1). They occur in the open country and the broadleaf shrub in the Arctic, Alpine and Boreal zones. They favour mosaic habitat types (Harrison, 1982; Cramp and Simmons, 1979; del Hoyo et al., 1994).

Recently some new data on the "mixed" faunas have been obtained. Finds of a newly described junglefowl *Gallus meschtscherienis* and *Emys orbicularis* from the Late Paleolithic settlement of Soungir (near Vladimir, Moscow Region) have been found together with the remains of *Alopex lagopus, Rangifer tarandus, Dicrostonyx sp., Lagurus lagurus,* and *Mammuthus primigenius.* Another junglefowl, *Gallus imereticus* n. sp., from the Magdalenian of the Cave Gvardjilas-Klde in Imeretia (Georgia) has been found in an ansamblage with *Lagopus lagopus* (Burchak-Abramovich, 1996). It seems such examples will change the traditional ideas on the bionomy *of Lagopus, Pavo* and *Gallus* species in the Plio-Pleistocene. The find of *Lagopus* sp. from Muselievo is interesting with its ancient date. Vilette (1986) and Janossy (1991) refer the beginning of Tetraonids (and g. *Lagopus*) to the Late Pliocene. The Bulgarian find is the oldest record of that genus up to now.

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