

On the presence of *Tetrao partium* (Kretzoi, 1962) (Aves: Tetraonidae) in the Late Pliocene of Bulgaria

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Geographical and stratigraphical distribution of *Tetrao partium* (Kretzoi, 1962)

The fossils of *T. partium* were reported from: Early Pleistocene - Betfia in NW Romania (final of the Early Pleistocene /Biharian/ (BRODKORB, 1964; JURCHAK & KESSLER, 1987); Voigtstedt in Germany (JANOSSY, 1965); Beremend 16 in S Hungary (ca. 1,0 Ma) (JANOSSY, 1992); Villany 3 („Lower Pleistocene“), Villany-Nagyharsany-hegy („Lower-Middle Pleistocene“), Osztramos 2, 5, Somssich Hill 2 („Early Villafranchian“) in Hungary (JANOSSY, 1976; 1986); Middle Pleistocene - Stranska Skala in Slovakia (JANOSSY, 1972); Carpathian Basin (JANOSSY, 1980); Gombaszog, Pispokfurdo 1,2, Mehesz, Tarko, Varhegy-Budapest and Vertesszollos in Hungary, Seneze in France, and Tchorkow in Ukraine (JANOSSY, 1976; 1986).

JURCHAK and KESSLER (1987) summarized that the species was wide spread throughout Europe (Stranska Skala /Czechoslovakia/, Hundsheim /Germany/, Csarnota, Tarko /Hungary/, etc.). It is worth noting, that both species (*T. tetrix* and *T. partium*) coexisted in the Gunz-Mindel Interglacial in Romania (JURCHAK & KESSLER, 1988).

Thus, the geographical range of *T. partium* following JANOSSY (1976) encompasses a large territory of Europe from France to Ukraine, while stratigraphically the species was spread from the Middle Villafranchian to Mindel. At the same time, MLIKOVSKY (1996) lists no Tertiary sites of that species in Europe. Most abundant summary data were cited by TYRBERG (1998). According to him, the stratigraphic range of *T. partium* is between 19 and 21 MNQ zones, while the geographic range encompasses France, Hungary, Romania, Austria, Germany and former Czechoslovakia.

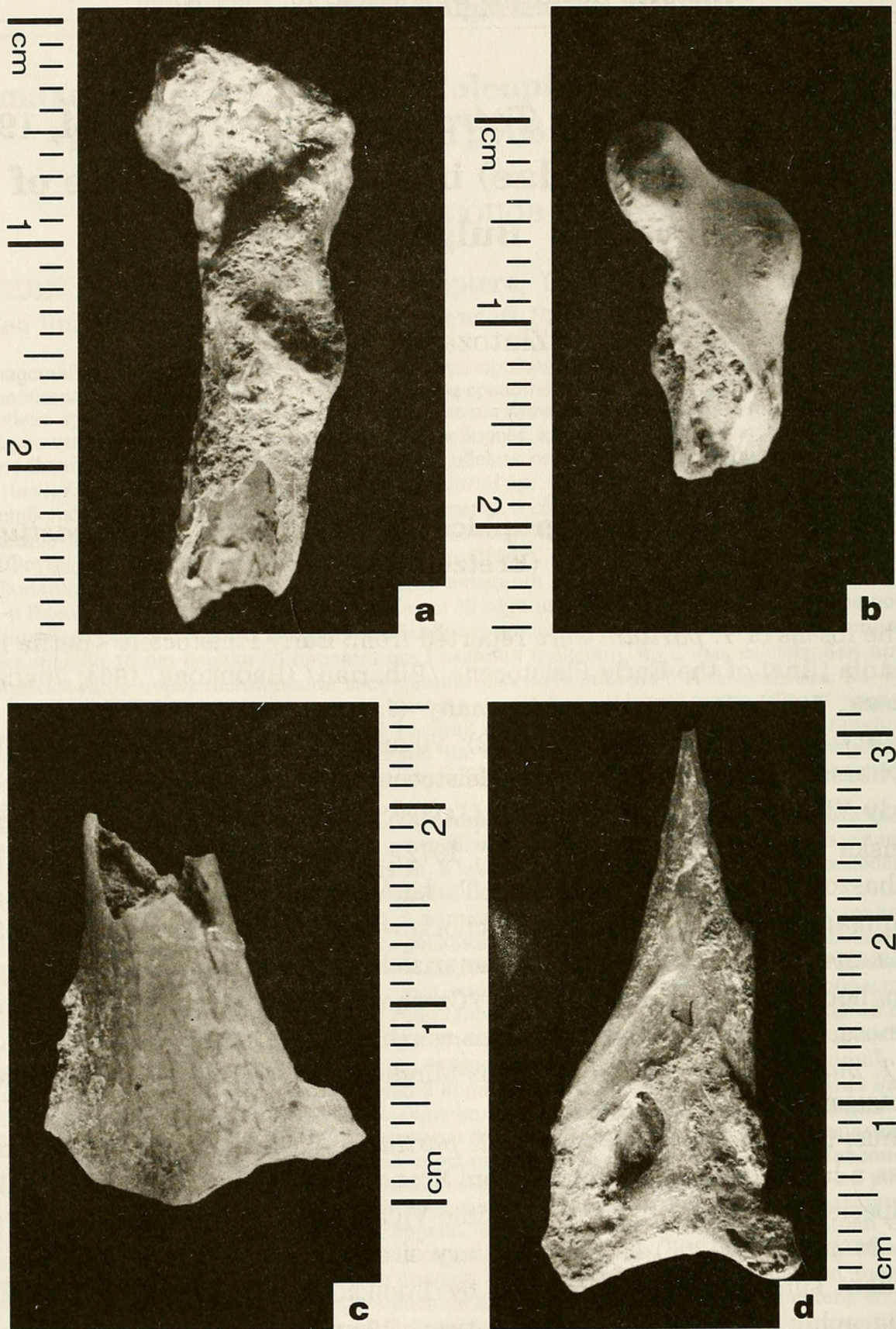


Fig. 1. *Tetrao partium*: a - coracoid dex., humeral part, NMNHS 278; b - coracoid sin., humeral part, NMNHS 279; c - coracoid dex., sternal part, NMNHS 280; d - coracoid sin., sternal part, NMNHS 281

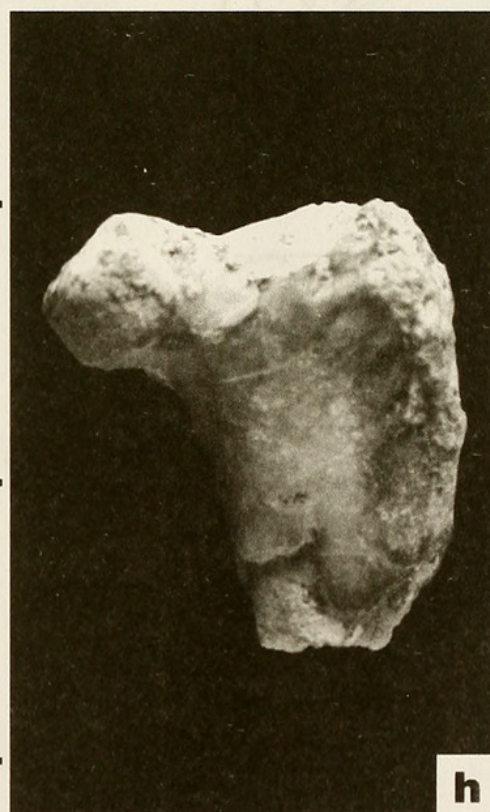
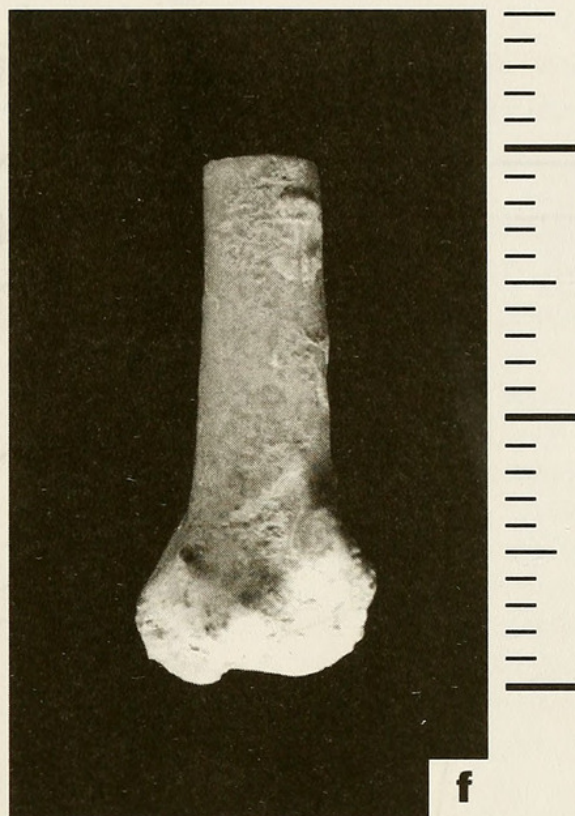


Fig. 1. *Tetrao partium*: e - ulna dex. prox., NMNHS 282; f - ulna dex. dist., NMNHS 283; g - phalanx prox. dig. majoris dex., NMNHS 158; h - femur sin. prox., NMNHS 157 (Photographs: Boris Andreev)

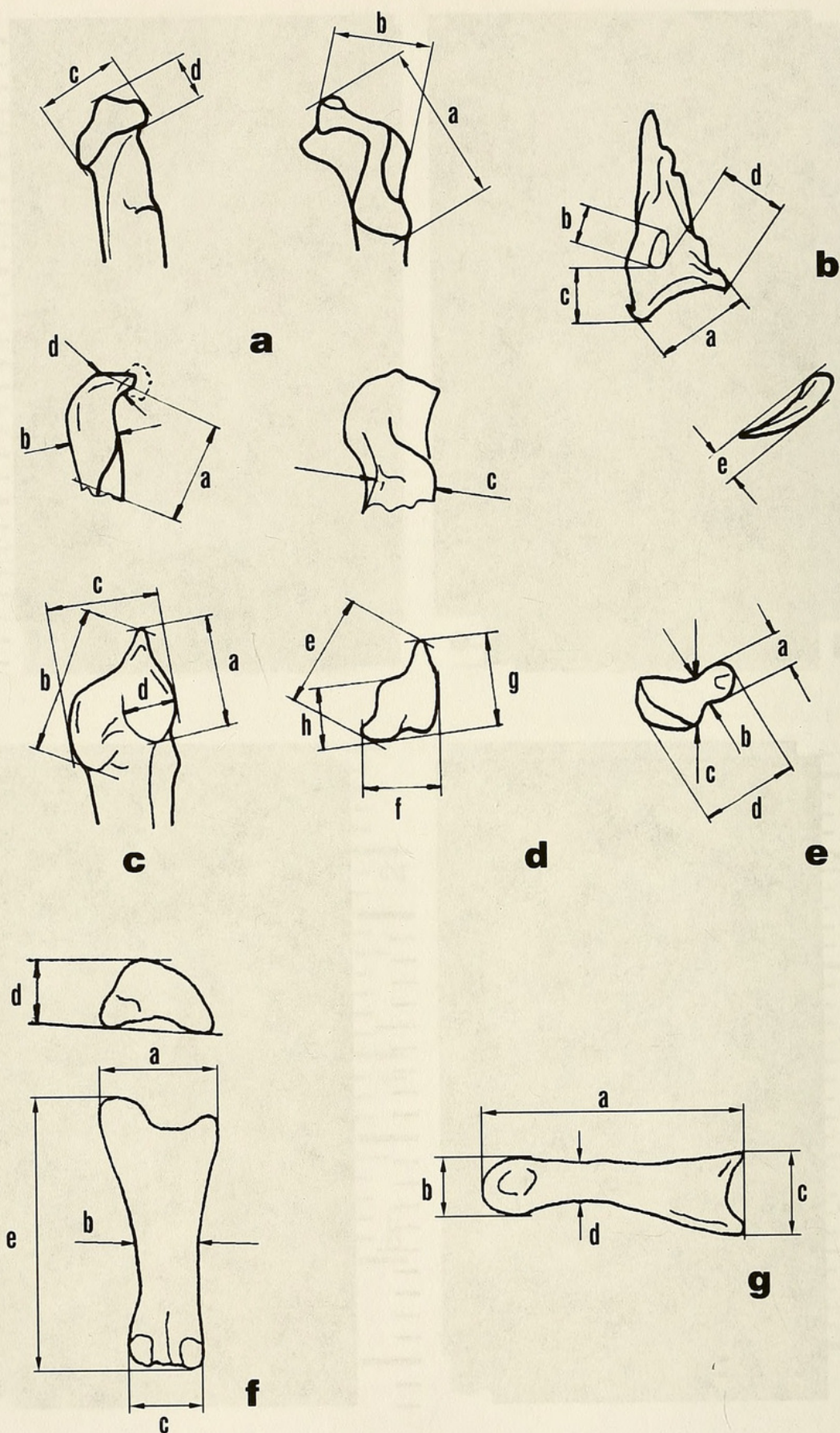


Fig. 2. The manner of bone measuring: a - humeral part of coracoid; b - sternal part of coracoid; c - proximal ulna; d - distal ulna; e - proximal femur; f - phalanx I dig. 2 pedis (NN 185, 201); g - phalanx I dig. 2 pedis (N 194) and phalanx II dig. 3 pedis (N 245) (Drawings: Vera Hristova)

Table 1

Measurements of coracoid (humeral part) in fossil and recent Tetraonidae

Species	a	b	c	d
Fossil				
<i>Tetrao</i> aff. <i>partium</i> NMNHS 279	18,2	11,1	8,3	5,0
<i>Tetrao</i> aff. <i>partium</i> NMNHS 278	18,1	11,1	8,0	5,2
<i>Phasianus etuliensis</i> *	15,2	10,0	6,7	3,7
Recent				
<i>Tetrao tetrrix</i> NMNHS 2/1982	20,3	13,4	7,5	5,5
<i>Lagopus lagopus</i> NMNHS 1/1986	15,9	10,6	6,8	4,0
<i>Tetrastes bonasia</i> NMNHS 1/1995	14,0	9,1	5,8	4,0
<i>Phasianus colchicus</i> UCBL (PIN 18/1)	16,4	11,7	7,0	4,2
<i>Phasianus colchicus</i> UCBL (PIN 18/2)	15,1	10,7	6,3	4,1
<i>Phasianus colchicus</i> UCBL 131/1	15,3	10,0	6,4	4,1
<i>Phasianus versicolor</i> UCBL (VI-73)	17,4	10,5	6,6	4,4
„ <i>Phasianus obscurus</i> “ UCBL 458/1	16,0	10,5	6,7	5,2
<i>Syrnaticus reevesii</i> UCBL 457/1	12,5	7,5	4,4	3,3
<i>Numida meleagris</i> UCBL 453/1	17,3	10,4	6,9	5,2
<i>Gallus sonerati</i> UCBL 459/1	13,8	8,9	4,9	3,4
<i>Gallus sonerati</i> UCBL (II-73)	14,1	7,9	5,0	3,7
<i>Gallus gallus bankiva</i> UCBL 454/1	16,0	9,8	5,7	4,5
<i>Gallus gallus bankiva</i> UCBL 454/2	13,1	8,7	5,5	3,9
<i>Gallus gallus</i> UCBL 454/3	15,0	8,8	5,1	3,9
<i>Gallus gallus</i> UCBL 456/1	13,0	8,6	5,7	3,7
<i>Alectoris chukar</i> UCBL 126/6	13,4	8,6	5,0	3,6

* measured by BOCHENSKI & KUROCHKIN (1987)

Table 2

Measurements of coracoid (sternal part) in fossil and recent Tetraonidae

Species	a	b	c	d	e
Fossil					
<i>Tetrao</i> aff. <i>partium</i> NMNHS 280	-	4,9	-	9,8	4,9
<i>Tetrao</i> aff. <i>partium</i> NMNHS 281	14,0	5,1	7,15	10,2	4,4
Recent					
<i>Tetrao tetrrix</i> NMNHS 1/1982	15,0	4,3	9,3	11,3	5,0
<i>Tetrao tetrrix</i> NMNHS 2/1983	14,1	5,1	8,4	10,5	4,7
<i>Lagopus lagopus</i> NMNHS 1/1986	13,9	3,1	7,2	9,8	3,0
<i>Tetrastes bonasia</i> NMNHS 1/1995	10,2	2,8	6,7	7,8	3,4
<i>Phasianus colchicus</i> UCBL 131/4	13,4	5,3	6,3	9,1	5,2
<i>Phasianus colchicus</i> UCBL 131/6	14,8	5,1	6,2	10,1	4,8

Table 3

Measurements of coracoid (humeral part) in fossil and recent Tetraonidae

Species	a	b	c	d
Fossil				
<i>Tetrao aff. partium</i> NMNHS 178	ca.11,0	5,3	5,9	2,4
Recent				
<i>Tetrao tetrix</i> NMNHS 1/1982	11,5	5,8	7,2	3,2
<i>Tetrao tetrix</i> NMNHS 2/1982	11,0	6,0	7,0	3,0
<i>Lagopus lagopus</i> NMNHS 1/1986	9,5	5,6	5,3	2,4
<i>Tetrastes bonasia</i> NMNHS 1/1995	10,7	3,5	4,9	2,3
<i>Phasianus colchicus</i> UCBL 131/4	10,8	5,4	6,5	2,4
<i>Phasianus „obscurus“</i> UCBL 458/1	10,0	4,7	5,8	2,6
<i>Phasianus versicolor</i> UCBL (VI-73)	9,0	5,0	5,4	2,4
<i>Syrnaticus reevesii</i> UCBL 457/1	6,4	3,2	4,1	2,0
<i>Gallus gallus</i> UCBL 456/1	8,0	4,3	5,8	2,6
<i>Gallus gallus</i> UCBL 454/3	9,0	4,0	5,4	2,4
<i>Gallus sonerati</i> UCBL (II-73)	8,2	3,8	5,6	2,4
<i>Gallus sonerati</i> UCBL 459/1	8,0	3,6	5,2	2,5
<i>Numida meleagris</i> UCBL 453/2	9,6	5,4	6,7	3,1
<i>Alectoris chukar</i> UCBL 126/6	ca.11,0	5,3	5,9	2,4

Table 4

Measurements of ulna in fossil and recent Tetraonidae

Species	a	b	c	d	e	f	g	h
Fossil								
<i>Tetrao aff. partium</i> NMNHS 282	9,6	12,6	9,2	4,7	-	-	-	-
<i>Tetrao aff. partium</i> NMNHS 283	-	-	-	-	9,5	7,7	5,4	7,7
Recent								
<i>Lagopus lagopus</i> NMNHS 1/1986	8,3	11,3	7,5	5,4	8,1	8,0	6,5	4,9
<i>Lagopus mutus</i> NMNHS 1/1986	7,6	10,2	7,3	4,7	7,6	6,5	5,8	4,6
<i>Phasianus colchicus</i> UCBL 131/6	11,2	14,7	11,0	6,0	10,5	9,0	5,8	7,7

The finds of *Tetrao partim* from Bulgaria

The finds have been collected from the site near Varshets (43 13 N, 23 17 E), NW Bulgaria. This site represents a ponor in a rocky hill, 6 km NNE of the town of Varshets. They are kept in the Collections of the Fossil and Recent Birds Department of the National Museum of Natural History, Bulgarian Academy of Sciences - Sofia.

Horizon: Unconsolidated sediments accumulated in the filling of clay terra-rossa with unstratified inner structure. The fossil bones are broken, sometimes making a kind of bone breccia.

Chronostratigraphy: Middle Villafranchian. The associated mammalian fauna attributes the site to the MN 17 zone (SPASSOV, 1997; 1998; V. POPOV - pers. comm.).

Table 5

Measurements of femur prox. in fossil and recent Tetraonidae

Species	a	b	c	d
Fossil				
<i>Tetrao aff. partium</i> NMNHS 157	5,8	5,6	7,3	13,1
Recent				
<i>Tetrao tetrrix</i> NMNHS 1/1982	6,0	5,6	8,3	14,7
<i>Tetrao urogallus</i> NMNHS 2/1983	9,6	9,4	13,1	22,6
<i>Tetrao urogallus</i> NMNHS 4/1989	9,0	8,4	12,6	21,7
<i>Tetrao urogallus</i> NMNHS 5/1996	9,1	8,3	12,1	22,4
<i>Lagopus lagopus</i> NMNHS 1/1986	5,0	4,8	6,4	12,5
<i>Lagopus mutus</i> NMNHS 1/1986	4,5	4,3	4,9	10,6
<i>Phasianus colchicus</i> UCBL 131/2	6,8	6,6	9,8	17,2
<i>Phasianus colchicus</i> UCBL 131/4	6,4	6,1	8,6	16,0

Table 6

Measurements of synsacrum, pars axialis in fossil and recent Tetraonidae

Species	a	b	c	d	e
Fossil					
<i>Tetrao aff. partium</i> NMNHS 196	25,6	15,1	2,9	ca.8,5	ca.9,2
Recent					
<i>Tetrao tetrrix</i> UCBL 123/2	-	15,4	ca.2,8	8,2	8,9
<i>Lagopus mutus</i> UCBL 122/1	-	15,0	ca.3,0	6,8	7,7
<i>Phasianus colchicus</i> UCBL 131/6	-	14,0	2,1	8,0	9,1

Table 7

Measurements of tarsometatarsus dist. in fossil and recent Tetraonidae

Species	a	b	c	d	e	f
Fossil						
<i>Tetrao aff. partium</i> NMNHS 198	3,8	5,4	2,5	4,9	4,0	9,9
Recent						
<i>Tetrao tetrrix</i> UCBL 123/1	4,4	5,6	2,5	5,0	4,5	9,7
<i>Tetrao tetrrix</i> UCBL KG/2	4,1	5,4	2,5	4,7	3,8	9,3
<i>Tetrao urogallus</i> UCBL KG/1	7,0	9,1	4,5	8,7	7,2	16,6
<i>Bonasa bonasia</i> UCBL 125/1	2,6	3,7	1,8	3,7	2,9	7,1
<i>Lagopus lagopus</i> UCBL KG/4	-	4,7	2,3	-	3,8	7,8
<i>Lagopus mutus</i> UCBL KG;/3	2,9	3,6	1,6	3,4	2,8	6,9
<i>Lagopus mutus</i> UCBL 122/1	3,4	4,2	1,8	4,0	3,1	7,8

Anatomically the finds belong as follows: coracoid dex., humeral half, N 278; coracoid dex., sternal part, N 280; coracoid sin., sternal part, N 281; coracoid sin., humeral part, N 279; ulna dex. prox., N 282; ulna dex. dist., N 283; femur sin.

Table 8

Measurements of phalanx I dig. 2 pedis in fossil and recent Tetraonidae

Species	a	b	c	d	e
Fossil					
<i>Tetrao aff. partium</i> NMNHS 201	3,8	2,1	2,6	3,4	10,9
<i>Tetrao aff. partium</i> NMNHS 185	4,3	2,2	2,9	3,4	10,8
Recent					
<i>Tetrao tetrix</i> UCBL 123/M	4,2	2,0	ca.3,3	3,4	10,2
<i>Tetrao urogallus</i> UCBL 124/M	ca.7,0	3,6	5,1	ca.6,0	11,8
<i>Lagopus lagopus</i> UCBL 120/M	ca.3,8	1,9	ca.2,9	3,6	11,0
<i>Lagopus mutus</i> UCBL 122/1	3,3	1,9	2,4	3,0	7,5
<i>Lagopus mutus</i> UCBL 122/2	3,0	1,6	2,3	2,8	9,8
<i>Lagopus mutus</i> UCBL 122/4	2,7	1,3	2,0	2,2	8,4
<i>Alectoris chukar</i> UCBL 126/6	3,6	2,0	2,8	3,0	9,9

Table 9

Measurements of phalanx I dig. 2 pedis in fossil and recent Tetraonidae

Species	a	b	c	d
Fossil				
<i>Tetrao aff. partium</i> NMNHS 194	11,8	2,2	3,2	1,7
Recent				
<i>Tetrao tetrix</i> UCBL 123/PM	10,7	1,8	3,2	1,5
<i>Tetrao urogallus</i> UCBL 124/PM	17,5	3,3	5,8	2,8
<i>Lagopus lagopus</i> UCBL 120/PM	8,2	2,6	3,4	1,8
<i>Lagopus mutus</i> UCBL 122/2	8,1	2,1	3,2	1,6
<i>Lagopus mutus</i> UCBL 122/8	7,5	2,0	2,9	1,6

Table 10

Measurements of phalanx II dig. 3 pedis in fossil and recent Tetraonidae

Species	a	b	c	d	e
Fossil					
<i>Tetrao aff. partium</i> NMNHS 245	11,6	2,0	1,7	3,2	3,1
Recent					
<i>Tetrao tetrix</i> UCBL 123/PM	12,0	2,4	1,8	3,7	4,0
<i>Tetrao urogallus</i> UCBL 124/PM	19,4	4,3	3,5	6,9	6,0
<i>Lagopus lagopus</i> UCBL 120/PM	8,4	3,4	2,0	3,9	3,7
<i>Lagopus mutus</i> UCBL 122/2	8,1	2,1	1,6	3,1	3,0
<i>Lagopus mutus</i> UCBL 122/8	7,6	2,0	1,6	3,0	2,9

prox., N 157; phalanx prox. dig. majoris dex., N 158; (Fig. 1); coracoid sin., humeral part, N 178, synsacrum, pars axialis, N 196; tarsometatarsus sin. dist., N 198; phalanx I dig. 2 pedis, N 201; phalanx I dig. 2 pedis, N 185; phalanx I dig. 2 pedis

N 194; phalanx II dig. 3 pedis, N 245.

Measurements: see Tables 1-10 and Fig. 2.

Collections acronyms: UCBL - Centre des Sciences de la Terre at the Université Claude Bernard - Lyon; NMNHS - Fossil and Recent Birds Department of the National Museum of Natural History, Bulgarian Academy of Sciences - Sofia,

Comparative material examined: The fossils from Varshets were compared with the homologous skeleton elements of the following species: *Tetrao tetrix* - NMNHS 1/1982; 2/1983; UCBL 131/4; *Tetrao urogallus* - NMNHS 2/1983, 4/1989, 5/1996; *Lagopus lagopus* - NMNHS 1/1986; *Lagopus mutus* - NMNHS 1/1986; *Tetrastes bonasia* NMNHS 1/1995; *Phasianus „obscurus“* - UCBL 458/1; *Phasianus versicolor* - UCBL (VI-73); *Syrnaticus reevesii* - UCBL 457/1; *Gallus gallus* - UCBL 456/1; UCBL 454/3; *Gallus sonerati* - UCBL (II-73); UCBL 459/1; *Numida meleagris* - UCBL 453/2; *Alectoris chukar* - UCBL 126/6.

Comparison

All finds show clear appurtenance to Galliformes. Both, morphologically and dimensionally, the finds from Varshets belong to a Tetraonidae representative. Larger tetraonids as the recent *Tetrao urogallus* and *T. parvirostris*, and the fossil *T. praeurogallus* and *T. macropus* may be excluded from our considerations, because of the larger size of the first two and the chronological differences of the last two.

Coracoid: The Uppermost Pliocene *T. conjugens* is characterized by its larger size and close morphological resemblance to *T. tetrix* (JANOSSY, 1976). Janossy wrote in the same paper: „The cranial part of coracoideum ... appears to be slender ...“ (p. 20), which corresponds to the finds from Varshets. In any case, the finds from Varshets can not be referred to the capercaillie group. The bone sculpture of the articular parts and the bone size unequivocally suggest a species of the Black Grouse (*Lyrurus*) type. It was reported (KRETZOI, 1961; JURCHAK & KESSLER, 1987), that the dimensions of *Tetrao (Lyrurus) partium* are intermediate between these ones of the recent *T. tetrix* and *Lagopus lagopus*. The applied photograph of a distal (cranial) fragment of the left coracoid of *T. partium* from Voigtstedt (JANOSSY, 1965, Table VII, 19) fully corresponds to our finds of Varshets. In comparison to *T. tetrix*, N 278 and N 279 have a relatively shorter acrocoracoidal part (measurement „b“), while in comparison to *Lagopus lagopus* they have a wider impressio lig. acrocoracoidei. Compared with *T. tetrix*, the N 280 and N 281 finds have an almost twice smaller hook-like processus above the angulus medialis in the sternal part, while in comparison with *L. lagopus*, they have a twice wider facies articularis sternalis and more massive diaphyses.

Ulna: Compared with *L. lagopus* the N 282 find has a longer cotyla dorsalis, wider depressio m. brachialis and thicker diaphysis in the proximal end. The N 283 find has a much smaller condylus ventralis and a larger condylus dorsalis in

comparison with the same species. Dimensionally the find differs significantly from the *Tetrao* spp. of the *urogallus* lineage.

Femur: In comparison with *T. tetrrix* the N 157 find has a smaller facies articulationis antitrochantherica, a larger surface of fovea ligamenti capiti and a less developed colum femori, while in comparison with *L. lagopus* and *L. mutus* it has a more robust appearance and a thicker colum femori. In comparison with *T. urogallus*, N 157 has a shallower fovea ligamenti capitis and longer colum femori.

Phalanx prox. dig. majoris dex., N 158: Its dimensions are larger than these of *L. lagopus* and *L. mutus* and smaller than these of *T. urogallus*. Morphologically it stands closer to g. *Tetrao* (*T. tetrrix*), than to *Lagopus*.

Phalanx I dig. 2 pedis, NN 185, 194, 201 and phalanx II dig. 3 pedis, N 245: Dimensionally these finds with their smaller size differ significantly from the *Tetrao* spp. of the *urogallus* lineage. They are also larger than *Lagopus* species.

Conclusions

The finds of *Tetrao partium* from Bulgaria complete our data on both, the geographical and the stratigraphical distribution of that galliform. The remains from Varshets confirm its wider distribution throughout East Europe in the Middle Villafranchian. Thus, *T. partium* is known from France, Germany, Slovakia, Hungary, Ukraine and Bulgaria. These are some of the earliest evidences for the existence of that species as a whole. The Bulgarian finds are the first records of the species on the Balkans and mark the southern limit of its range.

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За наличето на *Tetrao partium* (Kretzoi, 1962) (Aves: Tetraonidae) в късния плиоцен в България

Златозар БОЕВ

(Р е з ю м е)

Чрез 15 находки от средно-вилафранкското находище (вилан) край гр. Вършец се доказва разпространението на вида в България и се допълва значително неговата морфологичната характеристика.

Направен е преглед на географското и хроностратиграфското разпространение на вида, обхващащ данни за 14 негови находища от среден вилафранк до мундел. Вършец е най-южното му и най-гревно находище, с което се разширява значително ареалът на този фосилен тетраонид в края на плиоцена. Ареалът му е обхващал средновисоките планински райони във Франция, Германия, Словакия, Унгария, България и Украйна. *Tetrao partium* не е бил предшественик на *T. tetrix*, а негов съвременник.

В материала са представени coracoid, ulna, femur prox., phalanx prox. dig. majoris, synsacrum, pars axialis, tarsometatarsus, phalanx I dig. 2 pedis и phalanx II dig. 3 pedis, някои от които като анатомични елементи досега бяха неизвестни за този вид.



Boev, Zlatozar. 1999. "On the presence of Tetrao partium (Kretzoi, 1962) (Aves: Tetraonidae) in the Late Pliocene of Bulgaria." *Historia naturalis bulgarica* 10, 85–96.

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