AQUILA

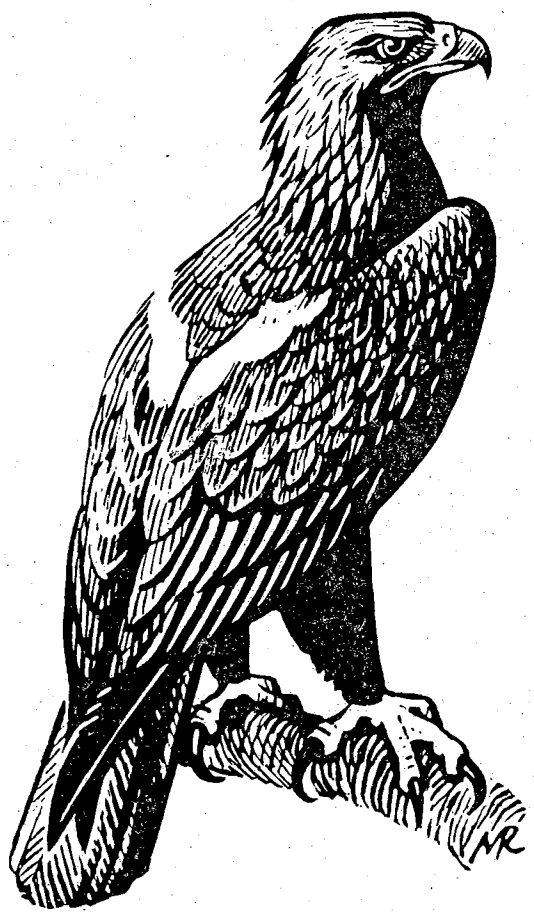
A MAGYAR MADÁRTANI INTÉZET

(AZ ORSZ. TERMÉSZETVÉDELMI HIVATAL
MADÁRTANI INTÉZETE)

ÉVKÖNYVE

ANNALES INSTITUTI ORNITHOLOGICI HUNGARICI

1977



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LXXXIV. ÉVFOLYAM. TOM: 84

VOLUME: 84

BUDAPEST, 1978

PLIO-PLEISTOCENE BIRD REMAINS FROM THE CARPATHIAN BASIN III. STRIGIFORMES, FALCONIFORMES, CAPRIMULGIFORMES, APODIFORMES

Dénes Jánossy

In two previous papers I dealt with the *Galliform* birds of the corresponding territory and age. Among the Plio-Pleistocene bird remains of the Carpathian Basin no other order of birds has the same systematico-stratigraphical significance as the chikenlike birds. While the remains of the latter order occur regularly and often in large quantities in faunas which contain birds at all, the bones originating from other orders are generally sporadical and occasional.

I chose for the next chapter the description of the remains of birds of four different orders; three of them are in the opinion of recent zoologists strongly related on the basis of etological-phenological arguments the owls *(Strigiformes)*, the nightjars *(Caprimulgiformes)* and the swifts *(Apodiformes)*. Against a series of anatomical and ethological resemblances these relation-

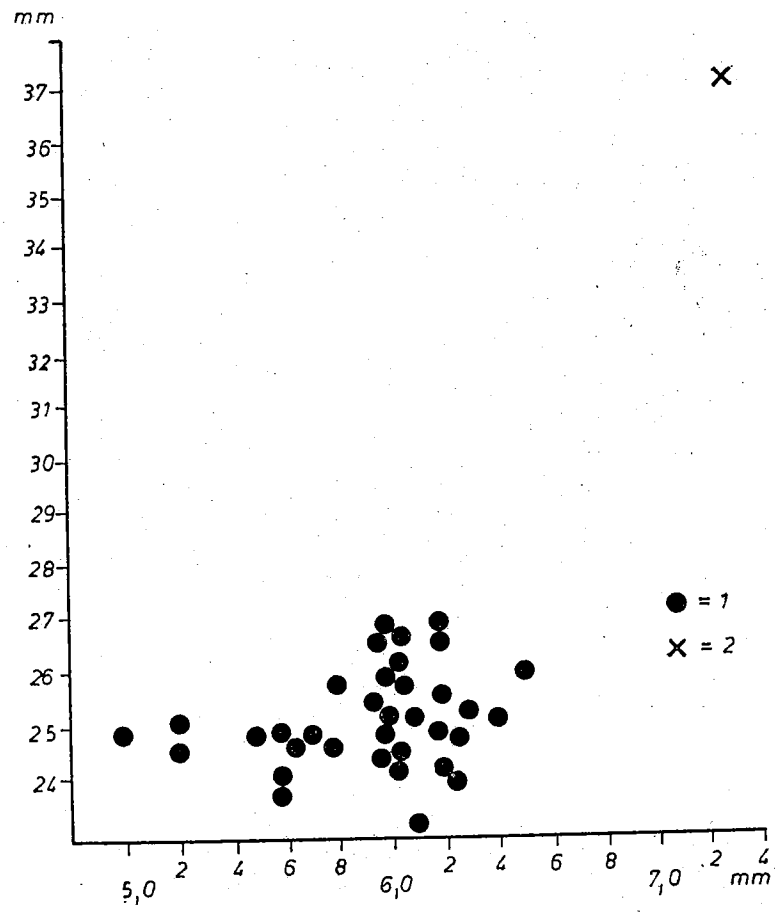

Fig. 1. *Scatter diagram showing the ratio of length (perpendicular axis) and width of diaphysis (horizontal axis) of the tarsometatarsi of fossil and recent Surnia species*

1. Surnia ulula, Upper Pleistocene ans recent; 2. Surnia robusta n. sp., Loc. 3. Villány, Lower Pleistocene

1. ábra. *A csonthossz (függőleges tengely) és diaphisis-szélesség (vízszintes tengely) adatainak szórásdiagramja (mm) fosszilis és recens karvalybaglyok lábközépcsontján*

1. Surnia ulula, felsőpleisztocén és recens; 2. Surnia robusta n. sp., Villány 3. alsó-pleisztocén

ships are not supported osteologically. On the other hand, the (diurnal) birds of prey *(Falconiformes)* and the owls *(Strigiformes)* are despite numerous anatomical and ethological differences, osteologically related, moreover there are in some groups „transitional" features: e.g. in the osprey *(Pandion haliaetus)* which has no foramen on the anterior surface of the femur but possesses a bony bridge over the extensor groove in the tarsometatarsus and the fourth digit of the pes is reversible, all typical features of the owls. These facts speak on the one hand for a very old (Lowest Tertiary) but in their roots strong relationship of the two latter orders and on the other for a mosaic-like evolution of different details of the body of all orders under discussion. Therefore I agree with DEMENTIEW (1951) who emphasises (not on the basis of osteological investigations!) the numerous characteristics of owls in common with diurnal raptors with those of e.g. the goatsuckers being only convergencies.

In other respects the owls, the birds of prey, as well as the swifts and the nightjars are osteologically well circumscribed groups and the determination of the members of these orders is quite unambiquus.

Order: *Strigiformes*
Family: *Strigidae*
Genus: *Surnia*
Surnia robusta n. sp.
(Fig. 1.—2.—3. and 5./9—10—11)

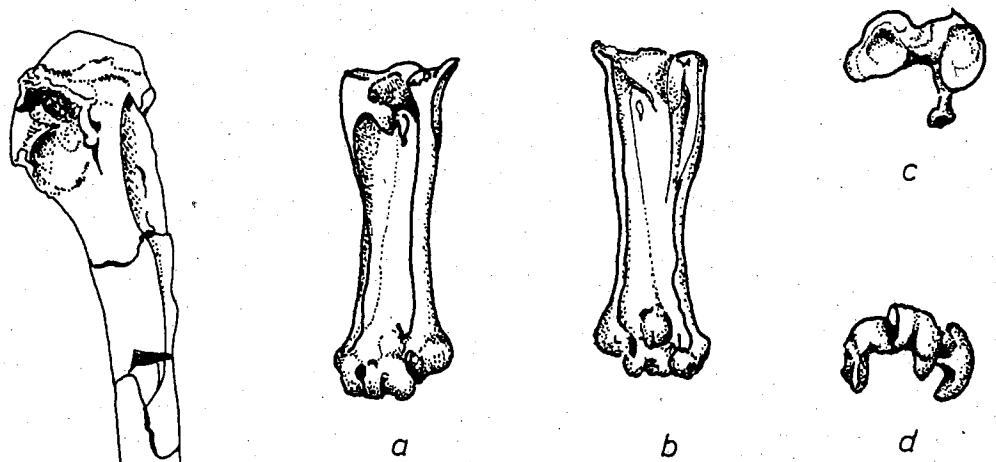

Fig. 2. *Surnia robusta n. sp., right tarsometatarsus from Loc. 3. Villány, type of the species*
a) dorsal; b) ventral; c) proximal; d) distal view. Pinxit I. Richter

2. ábra. *Surnia robusta n. sp., jobb oldali lábközépcsontja Villány 3. lelőhelyről (a faj típusa)*
a) dorzális; b) ventrális; c) proximális; d) disztális nézetben. Richter Ilona grafikusművész rajza

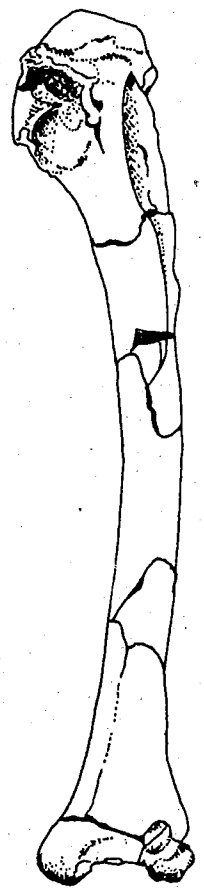

Fig. 3. *Surnia robusta n. sp., right humerus, medial view, Loc. 3. Villány.* Pinxit I. Richter

3. ábra. *Surnia robusta n. sp., jobb oldali felkarcsont mediális nézetben, Villány 3. lelőhely*
Richter Ilona grafikusművész rajza

Derivatio nominis: robusta, named after the Latin: robustus = strong, large, due to the huge dimensions.

Diagnosis: A large *Surnia* species, larger than the hitherto known recent and fossil forms of the genus.

Type-locality: Karst fissure of the Locality Villány 3., mts Villány, Southern Hungary.

Type-level: Lower Pleistocene („Middle Villafranchian", „Upper Villanyian").

Holotype: Complete left tarsometatarsus, leg. Kormos, T., Datum?; Inv. Nr. Geol. Inst. Vt, 62.

Paratype: Proximally and distally slightly damaged right humerus, from the same locality.

Further material:

Loc. Villány 3 („Villány-Kalkberg" „Villány-Süd" in older literature); besides the type and paratype:

Three dist. fragments of tibiotarsi; five fragments of tarsometatarsi; one mt_1, three phalanx I digit 1 posterior; two phal. 1. digit 2. post., 4 phal. 2. dig. 2. post; 2 phal. 1 dig. 3; 2 phal. 2 dig. 2; three phal. 3 dig. 3, three phal. 4. dig. 4; nine ungual phalanges.

Loc. „Villány-Nagyharsány-hegy", leg. KORMOS (according to literary data, it is undecided from which one of the hithero known four fissures of the eastern quarry of the Nagyharsány-hegy the material originates; see KRETZOI, 1956):

Cranial fragment of the coracoideum; three scapularfragm., two dist. fragm. of humeri: three proximal and one distal fragm. of carpometacarpi; two phalanx 1 digit. 2 anterior; dist. fragm. of femur; five dist. fragm. of tibiotarsi; four different fragm. of tarsometatarsi; three phalanges 2 dig. 2 posterior; phal. 2 dig. 3 posterior; phal. 3 dig. 3 post.;

Loc. Beremend 4. (in KRETZOI, 1956), leg. KORMOS, 1936; Ungual phalanx (?phal. 2 dig. 1 posterior).

Loc. Osztramos 7, leg. JÁNOSSY, 1970: proximal fragment of the phalanx 2 digit 2 posterior.

This rich material, containing nearly seventy bones of nearly all anatomical regions, allows a satisfactory analysis and description of the new form.

For a detailed analysis, the type-specimen, the intact tarsometatarsus, is the most convenient. I compared it in detail with the same bone of all European *Strigiforms* as well as with extra-European ones available in the collections of the British Museum (Nat. Hist.), London and in the Humboldt Museum, Berlin.

A comparison with the corresponding bone of the following species was possible: *Otus scops* and *brucei*, *Bubo virginianus*, *Nyctea nyctea*, *Surnia ulula*, *Glaucidium passerinum & brasilianum*, *Athene noctua*, *Strix aluco*, *uralensis* and *nebulosa*, *Aegolius funereus*, *Asio otus* and *accipitrinus*, *Pulsatrix perspicillata*, *Ninox novaesealandiae*, *Gymnoglaux lawrencii*, *Speotyto cunicularia*, *Ciccaba virgata*, *Rhioptynx clamator*, *Ketupa ketupu*, *Scotopelia peli*, *Jubula lettii*, *Mimizuku gurney*, *Pseudoptynx philippensis*, *Lophostrix cristata*, *Micrathene whitney*, *Uroglaux dimorpha*, *Sceloglaux albifacies*, *Pseudoscops grammicus* and *Nesasio solomonensis*.

The stout form and size of the bone delimits it from most recent and fossil species. Although there are some morphological resemblances with certain

Table 1.

Measurements of the tarsometatarsi of middle-sized owls [only extra-European species, measured in the collection of the British Museum (Natural History)]

Owls	Length	Proximal width (mm)
Ketupa ketupu	67	14
Pulsatrix perspicillata 1.	56	14
Pulsatrix perspicillata 2.	53	14
Ninox novaeseelandiae	35	7
Gymnoglaux lawrencii	38	6
Speotyto cunicularia	49	8
Ciccaba virgata	46	9
Rhioptynx clamator	55	13
Scotopelia peli 1.	70	15
Scotopelia peli 2.	75	13
Jubula lettii 1.	42	4
Jubula lettii 2.	40	6
Mimizuku gurney	50	8
Pseudoptynx philipensis	75	10

genera, e.g. with the Palearctic *Nyctea* (viz. metrical-proportional relations) and with some other ones, e.g. the Neotropical *Pulsatrix* (former *Ciccaba*) *perspicillata* and *Rhioptynx* (former „*Asio*") *clamator*, the morphological relations seems closest with the tarsometatarsus of the monotypical species *Surnia ulula*.

I submit in table 1, for orientation, the length and the width on the narrowest point of the tarsometatarsi of the owl species in the size category of our fossil specimens.

On the other hand, a metrical comparison of the tarsometatarsus of Villány with that of 34 Upper Pleistocene and of recent specimens of the Hawk-Owl, given in a scatter diagram (see Fig. 1), proves unambiguousaly a statistically supported absolute difference in size (27% larger than the largest plusvariant of the recent form). In other respects the morphological resemblance of the tarsometatarsus of the new species and of *Surnia ulula* is in all details very close. The shape of the bone, from all details of the proximal and distal epiphysis to the form and width of the bony bridge over the extensor groove etc., shows such a close resemblance that there is no problem of a generic assignment.

The humerus — the most complete bone beside the tarsometatarsus — shows also unambiguousaly the generic features of *Surnia;* the strongly curved diaphysis, the elongated crista pectoralis, the widening of the distal epiphysis etc. speak all for this relegation.

The measurements of phalanges (see table 2.) evince that these bones are of the size of those of *Strix uralensis*, but with a stouter form, characteristic for the phalangeals of the hawk owl *(Surnia ulula)* with smaller dimensions. Although the generical characters of some other bones are not so pronounced, one relegate them to the same form owing to the near size category and proportions. As shown in table 2, all remains of the fossil form are absolutely larger than those of typical recent species. However, the differences in size as well as the proportions are not in each case the same. The humerus of the fossil species is larger only by 23% than that of the recent form, the phalanx 1. digit 2 anterior by 32%, the phalanx 1. digit 1 posterior by 40% etc. Thus the differences are mosaic-like and their proportions different.

Hitherto only one fossil species of the genus was described: *Surnia capeki* Jánossy, 1972, in the same size category as the recent birds, differing only in proportions and originating from the Middle Pleistocene (Stránská Skála).

Table 2.

Measurements of different bones of fossil and recent Surnia-species (in mm)

Measurements	Length	Prox. width	Dist. width	Width of diaphysis (middle)
Humerus:				
Surnia robusta n.sp.	±100	18	15.5 – 16.0 ($n=3$)	6.7
Surnia ulula, recent	67 – 72 ($n=7$)	12	11	4.8
Carpometacarpus:				
Surnia robusta n.sp.	–	11.0 – 11.5 ($n=2$)	–	–
Surnia ulula, recent	–	8.8	–	–
Phal. 1. digiti 2. anterior:				
Surnia robusta n.sp.	21.3 – 22.6	–	–	–
Surnia ulula recent	14.8	–	–	–
Femur:				
Surnia robusta n.sp.	–	–	12	5.3
Surnia ulula recent	–	–	9.0	3.7
Tibiotarsus:				
Surnia robusta n. sp.	–	–	–	11.0 – 12.2 ($n=6$)
Surnia ulula recent	–	–	–	8.5
Tarsometatarsus:				
Surnia robusta n. sp.	37.2	12.6	12.6 – 15.0 ($n=4$)	7.3
Surnia ulula, Upper Pleistocene and recent ($n=36$)	23 – 27	9 – 10	9.0 – 10.5	5.0 – 6.5
Phalanx 1. digiti 1. posterior:				
Surnia robusta n. sp.	12.9 – 14.0 ($n=4$)	–	–	2.5 – 3.8
Surnia ulula recent	10.0			1.7
Phal. 1. dig. 2. post.:				
Surnia robusta n. sp.	8.5 – 9.0 ($n=2$)	–	–	4.6 – 4.8
Surnia ulula recent	6.6	–	–	3.5
Phal. 2. dig. 2. post.:				
Surnia robusta n. sp.	15.0 – 15.6 ($n=6$)	–	–	4.0 – 4.3
Surnia ulula recent	12.0			2.8
Phalanx 1. dig. 3. post.:				
Surnia robusta n. sp.	7.5 – 7.8 ($n=2$)	–	–	4.8 – 5.1
Surnia ulula recent	5.2	–	–	4.9
Phal. 2. dig. 3. post.:				
Surnia robusta n. sp.	7.5 – 9.0 ($n=3$)	–	–	4.5 – 5.0
Surnia ulula recent	5.7			3.3
Phal. 3. dig. 3. post.:				
Surnia robusta n. sp.	14.6 – 16.0 ($n=2$)	–	–	4.0(2×)
Surnia ulula recent	12.2	–	–	2.9
Phal. 4. dig. 4. post.:				
Surnia robusta n. sp.	12.1 – 12.6 ($n=3$)	–	–	2.8 – 3.6
Surnia ulula recent	9.0	–	–	2.1

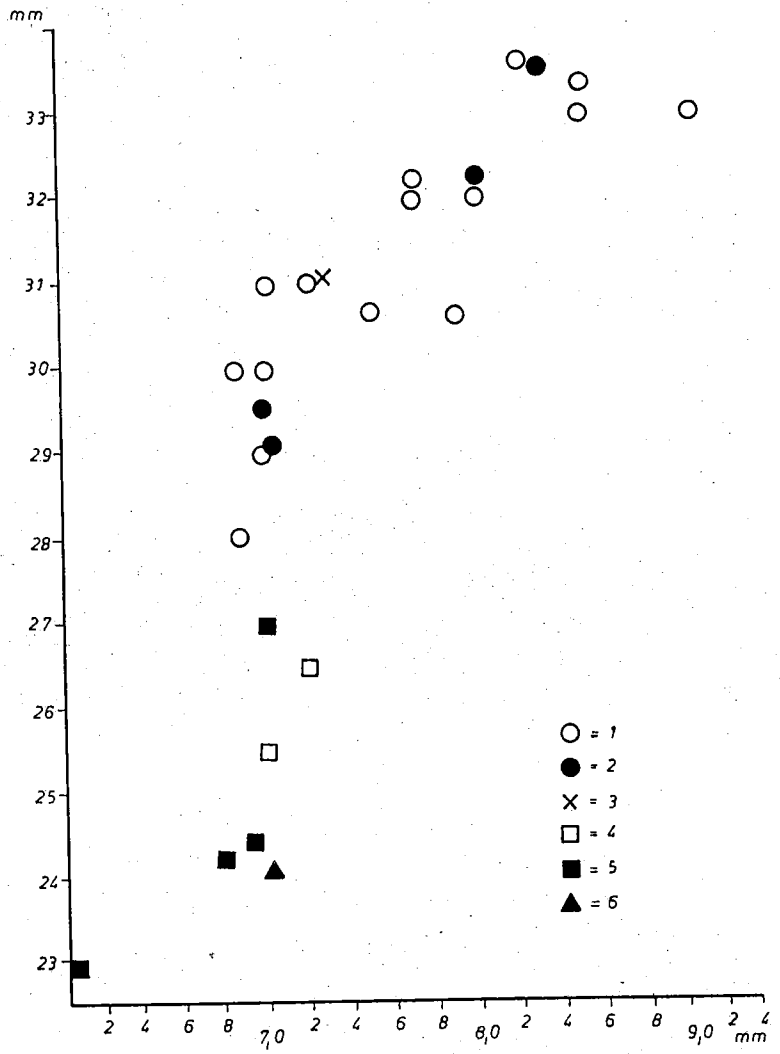

Fig. 4. *Scatter diagram showing the ratio of length (perpendicular axis) and width of diaphysis (horizontal axis) of the phalanx 2 digiti posterior of fossil and recent Aquila species.*

1. Aquila chrysaëtos recent; 2. the same, Saint Estéve Janson, France, Middle Pleistocene; 3. the same, Loc. 3. Villány, Lower Pleistocene; 4. Aquila rapax recent; 5. Aquila heliaca, recent; 6. the same, Lambrecht Cave, Upper Pleistocene

4. ábra. *A csonthossz (függőleges tengely) és diaphisis-szélesség (vízszintes tengely) adatainak szórásdiagramja (mm) fosszilis és mai sasfajok ujjpercénél (phalanx 2 digiti 2 posterior)*

1. Aquila chrysaëtos recens; 2. u. az, Saint Estéve Janson, Franciaország, középső pleisztocén; 3. u. az Villány 3. alsó pleisztocén; 4. A. rapax, recens; 5. A. heliaca, recens; 6. A. heliaca, Lambrecht barlang felső pleisztocén

The above described material of the new species *(Surnia robusta)* is strictly confined to the Lower viz. Lowest Pleistocene of our area.

From an ecological point of view it may be of interest that the recent monotypical species lives today in the northern forest zone (taiga zone) of Eurasia and North America and in the mountain zone (mountain forest subzone) of especially central Asia. Migrations to the south are very limited.

It is a question whether the Lower Pleistocene form had the same ecological significance, in view of the fact that most of the remains originate — as we have seen — from the Submediterranean region of the Villány Mountains.

Genus: *Bubo*

Bubo aff. bubo Linné (Fig. 5/4—5—6—7—8).

Material: Csarnóta, Loc. 2. age: Uppermost Pliocene, leg. KORMOS: anterior fragment of a mandibula.

Osztramos 7, age: Lowest Pleistocene, leg. JÁNOSSY, 1971: dist fragm. of phal. 2 dig. 2 posterior, phal. 2 dig. 3 post.

Villány 3 (=„Villány-Kalkberg"), age: Lower Pleistocene, leg. KORMOS: phalanx 3 digit 3.

Villány-Nagyharsány-hegy, age: the same, leg. KORMOS, phalanx 4 digit 3.