

NEW CONTRIBUTIONS TO THE KNOWLEDGE OF THE LOWER CRETACEOUS BIRD REMAINS FROM CORNET (ROMANIA)

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INTRODUCTION

The fossil bird remains which were discovered in the bauxite from Cornet in 1978 were described by Kessler and Jurcsak in 1984.

This material, presented at the III S.M.T.E. Tübingen, 1984 (by Kessler) and at the Archaeopteryx Symposium from Eichstatt, 1984 (by Jurcsak) stirred great interest among the participants.

After the Symposiums, we received one more piece of information from Dr. W. Eck (Staatliches Museum Dresden, DDR) concerning the name of genus *Limnornis*, which was preoccupied, being described by Gould, in 1839 (Fam. Furnariidae, South America).

Under these circumstances we have to accept a change in the name of the genus and the diagnosis, but at the same time it is possible to include the results of our new investigations about the fossil remains from Cornet.

DESCRIPTION

The *Limnornis corneti* diagnosis was originally almost problematic as the belonging of the distal fragment of femur and several bones (fragments of humerus, ulna and carpometacarpus) to the same type was not sure.

The femur fragment is unquestionably avian, but it doesn't show closer similarity to any arboreal or water bird group, being of smaller size. Consequently, we didn't imagine it to belong to a Ratite.

The comparison of the fossil femur with femora from subfossil and living species of Ratite birds (*Aepyornis*, *Dinornis*, *Struthio*, *Dromaius*, *Casuarius*, *Rhea* and *Apteryx*) existing in the "Grigore Antipa" Museum from Bucharest (Romania), caused us a great surprise: at first sight, they resemble in the form of fibular condyle, of fossa poplitea and other characteristics.

On the basis of these anatomical features, we have to establish a new group for it:

Infraclass Ratitae

Order Palaeocursornithiformes n.ord.

Family Cursornithidae n.fam.

Genus *Palaeocursornis* n.g.

Palaeocursornis biharicus n.sp.

Holotype: distal fragment of femora sin. (Muzeul Țării Crișurilor Oradea, MTCO Nr. 1637, Cornet);

Fossiliferous site and age: Cornet, Aștileu village (Romania, Bihor County) Pădurea Craiului Mountain, at 492 m height, in a bauxite lens, Lower Cretaceous — Wealdian;

Etymology: from the Latin *cursor* (runner), *ornis* (bird) and the name of the Romanian county (Bihor);

Diagnosis (for order, family, genus and species) — a running bird form of smaller size; the femur of *Palaeocursornis* conspicuously differs from that of *Archaeopteryx* and of all the *Carinatae*, by the following characters:

- the *external condyle* is prominent and longer than the *internal condyle*
- the *tibio-fibular crest* and *internal condyle* are rounded
- the *intercondylar fossa* is narrow
- under the *external condyle* there is a deep fossa for the attachment of the *ligamentum cruciatum*
- the *fibular crest* is laterally oriented in right angle, similar to all the *Ratitae* and not obliquely as in all the *Carinatae* (and *Archaeopteryx* too).

Measurements (in mm): the bone size of the fossil remain and the reference materials were the following:

- length of femur: fossil bone = approxim. 54—55,0 (length of fragment is = 29,0); *Apteryx* = 101,0; *Rhea* = 217,0; *Dromaius* = 340,0
- width and thickness of diaphysis above the distal epiphysis = 7,2 and 5,1; *Apteryx* = 13,0 and 11,0; *Rhea* = 23,0 and 20,0; *Dromaius* = 48,0 and 42,0.
- width of distal epiphysis = 14,4; *Apteryx* = 28,0; *Rhea* = 60,0; *Dromaius* = 95,0.
- thickness of distal epiphysis at the level of the *external condyle* = 14,8; *Apteryx* = 21,0; *Rhea* = 55,0; *Dromaius* = 102,0.
- thickness of distal epiphysis at the level of *fibular condyle* = 9,8; *Apteryx* = 15,0; *Rhea* = 37,0; *Dromaius* = 72,0.
- thickness of distal epiphysis at the level of the *internal condyle* = 9,8; *Apteryx* = 19,0; *Rhea* = 46,0; *Dromaius* = 85,0.

The sizes of other running birds — *Struthio*, *Dinornis* and *Aepyornis* are bigger than the enumerated forms.

Infraclass *Carinatae*

Order *Limnornithiformes*

Family *Eurolimnornithidae*

Eurolimnornis corneti

(Syn. *Limnornis corneti* Kessler et Jurcsak, 1984; *Palaeolimnornis corneti* Kessler et Jurcsak, 1985).

Holotype: right humerus, distal fragment (MTCO — P.Nr. 7896 Cornet).

Paratypes: ulna, diaphysal fragment (MTCO — P.Nr. 6966 Cornet; carpometacarpus, metacarpal fragment (MTCO — P.Nr. 207 Cornet).

Fossiliferous site and age: Cornet (Romania, Bihor County); Lower Cretaceous, Wealdian.

The diagnoses of order, family, genus and species correspond to the published text (in 1984), excepting those concerning the femur.

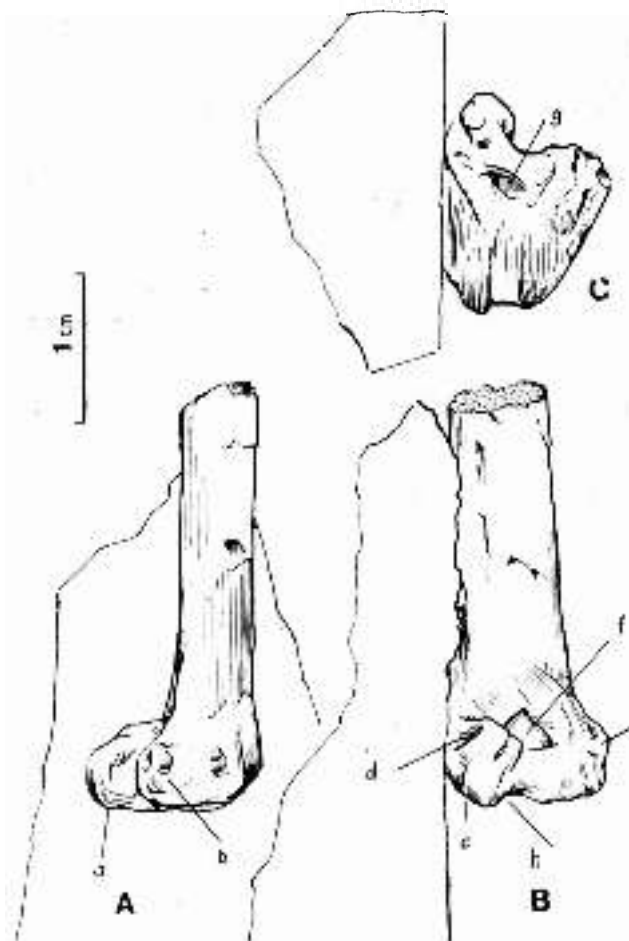


Fig. 1. *Palaeocursornis biharicus* n.sp. left femur, distal fragment, /MTCO—P. nr. 1637/, Cornet, A — internal aspect, B — ventral aspect, C — external aspect, a — external condyle, b — internal cond., c — fibular cond., d — fossa, e — apoph. gastrocnemialis int., f — fossa poplitea, g — fossa for ligam. cruciatum, h — intercondylar fossa;

DISCUSSION

The new observations largely modify the conclusions of our published researches and on the other hand they have a great importance regarding the origin of birds.

Thus it is clear that the femur fragment descended from the running bird type and, in this case, the other bones — which certified the flying capacity — do not descend from the same type.

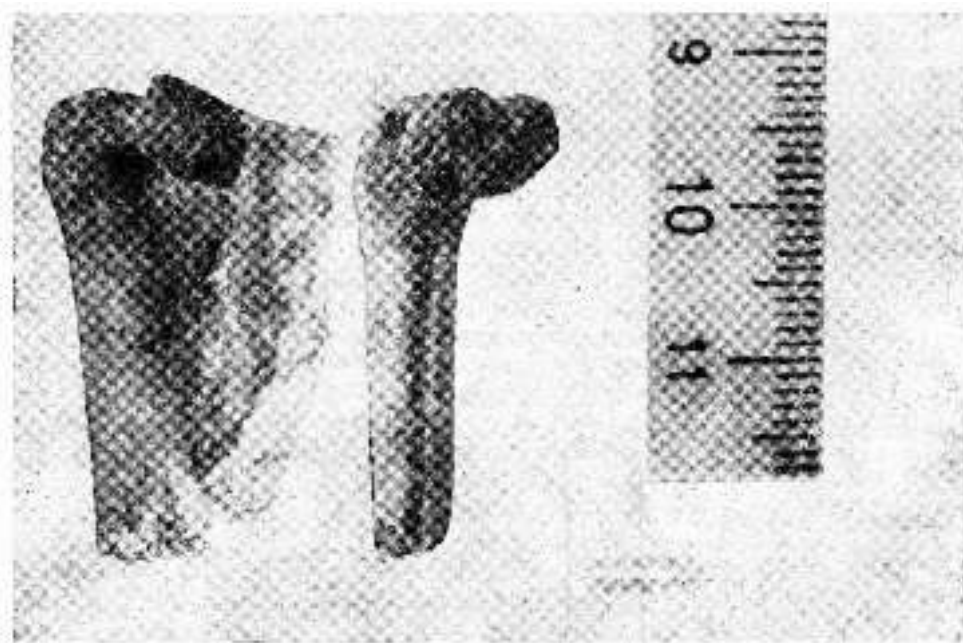


Fig. 2. *Palaeocursornis biharicus* n.sp. left femur, distal fragment, internal and ventral aspect /MTCO—P. nr. 1637/.

In conformity with this hypothesis, the Cornet material comprises three bird species: remains from *Archaeopteryx* sp. (fragments of humerus and ulna), from one water bird form, *Eurolimnornis corneti* (fragments of humerus, ulna and carpometacarpus) and from a running form, *Palaeocursornis biharicus* (with a femur fragment).

The *Archaeopteryx* bones discovered at Cornet bring a concrete proof that this group did not die out in Jurassic, but it was still alive in the Lower Cretaceous too, even manifesting a tendency towards “modernization” (an evolution in direction of the avian features).

Eurolimnornis corneti is a water bird form — with flying capacity (certified by the modern aspect of distal epiphysis of humerus, the fragment of ulna with anconal papillae and the existence of carpometacarpus) — while the development of the wings indicates the affiliation to Neornithes and Carinatae.

Palaeocursornis biharicus represents the earliest known remains of the Ratitae. The oldest running forms — known until today — are: *Eremopezus eocaenus* Andrews, 1904, from Upper Eocene of Fayum (Aepyornithidae, Eremopezinae) with distal fragment of tibiotarsus, and *Stromeria fajumensis* Lambrecht, 1929, from Lower Oligocene of Fayum (Aepyornithinae) with distal

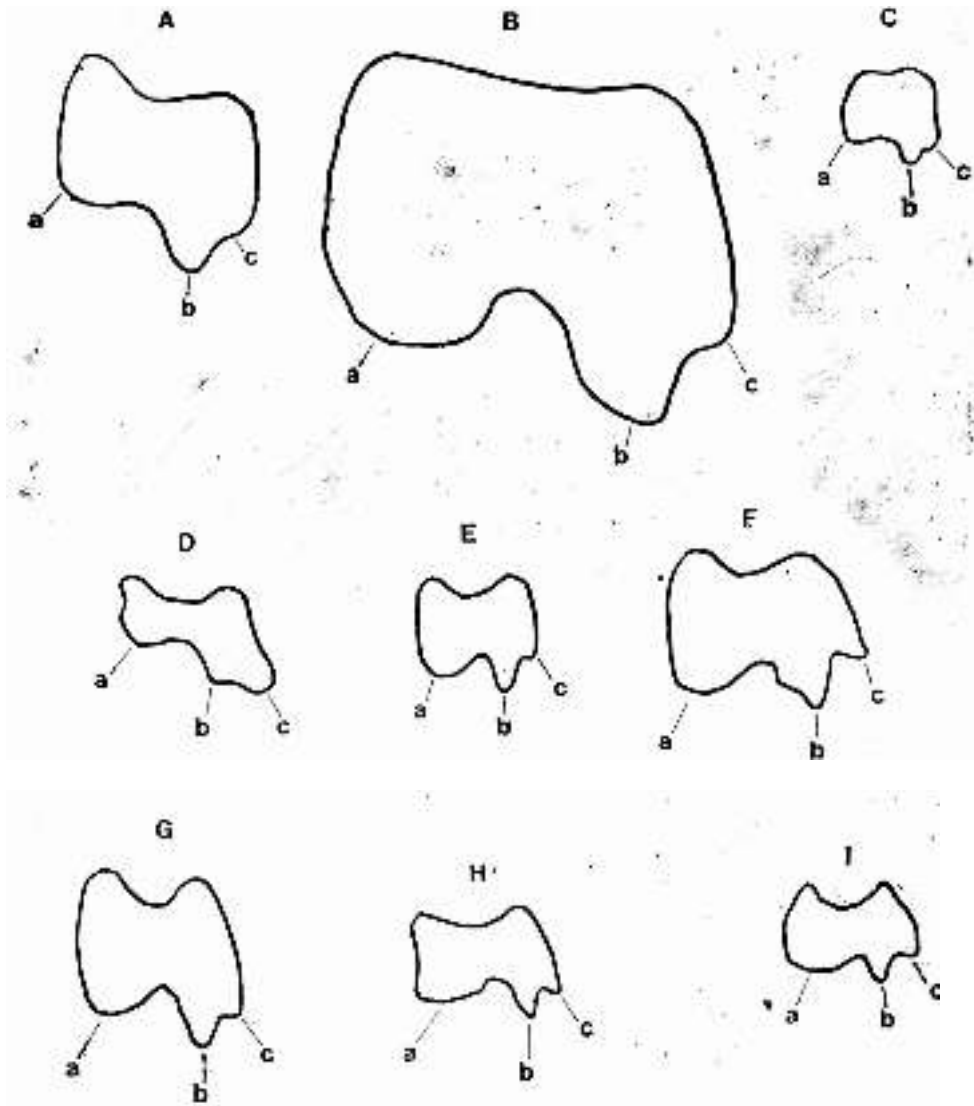


Fig. 3. Distal aspect of femora: A = *Apteryx*, B = *Rhea*, C = *Palaeocursornis biharicus* D = *Baptornis* /*Hesperornithiformes*/; E = *Gallus*, F = *Haliaeetus*, G = *Grus*, H = *Bubo*, I = *Anser*, a — internal condyle, b — external condyle, c — fibular condyle.

fragment of tarsometatarsus. Both remains are of bigger size compared to the bone from Cornet. They are also 60—70 million years younger than the Cornet remains.

CONCLUSIONS

The simultaneity presented by three bird-ecologic types in the fossil material from Cornet has a remarkable importance.

In the present phase of investigation, we can draw the following conclusions:

1. The *Archaeopteryx* group survived in the Lower Cretaceous and lived together with the more modern forms, probably in geographic isolation (in the islands it could survive for a larger time after its appearance in Upper Jurassic;

2. The early specialization of birds in Carinatae and Ratitae. The mono — or polyphyletic origin of birds is problematic, but the Lower Cretaceous remains from Cornet present a modern aspect in comparison with the primitive features of *Archaeopteryx*.

3. The water and running forms that were found in the Lower Cretaceous from Cornet present modern avian features suggesting their appearance in Jurassic.

The material from Cornet has been studied only partially and we are convinced that it will supply in the future new materials, new data and arguments for supporting the knowledge on the origins of birds.

NOI CONTRIBUȚII PRIVIND STUDIUL FOSILELOR DE PĂSĂRI DIN CRETACICUL INFERIOR DE LA CORNET (ROMÂNIA)

REZUMAT

Studiul pieselor fosile de păsări de la Cornet a demonstrat că fragmentul distal de femur atribuit speciei fosile *Limnornis corneti* Kessler et Jurcsak, 1984, provine de la o formă alergătoare, de talie mică (aproximativ 1/2 din talia speciilor genului *Apteryx* actual), dar având caracteristicile Ratitelor. Pe baza acestor caractere, piesa a fost atribuită unei noi specii, gen, familie și ordin: *Palaeocursornis biharicus* n.g., n. sp., Fam. Palaeocursornithidae n. fam., Ord. Palaeocursornithiformes n. ord.

Prezența acestei specii de ratite în Cretacicul inferior prezintă o însemnătate deosebită, având în vedere faptul că pînă acum acest grup a fost cunoscut numai din Neozoic, deci cu aproximativ 70 milioane de ani mai târziu decît fosilele de la Cornet.

Totodată, numele genului *Limnornis* fiind ocupat (prin genul *Limnornis* Gould, 1839 din Fam. Furnariidae, din America de Sud), numim genul găsit la Cornet *Eurolimnornis*, cu specia *corneti*, pasăre de apă zburătoare.

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