

Tertiary Avian Localities of the Czech Republic

J. MLÍKOVSKÝ

Institute of Geology and Paleontology, Charles University,
Albertov 6, 128 43 Praha 2, Czech Republic;
and Institute of Ecology, Czech Academy of Sciences,
Květná 8, 603 65 Brno, Czech Republic.

Accepted January 23, 1996

Abstract: Remains of Tertiary birds were found in 16 localities of the Czech Republic thus far. One of them, the early Miocene locality Dolnice, yielded significant number of bird bones and belongs to the most important avian Neogene localities in Europe.

Key-words: Aves, Tertiary, Oligocene, Miocene, Czech Republic.

INTRODUCTION

Tertiary birds from the territory of the Czech Republic were studied since the 1870s (Novák 1877, Bayer 1882, 1883, Laube 1901, 1909, 1910). Subsequently, a 70-years long hiatus appeared in the history of the Czech Tertiary paleornithology. The work was resurrected only in the 1980s by Petr Švec and the present writer (Švec 1980, 1981, 1982, 1983, 1984, 1985, Mlíkovský 1980, 1992, Švec and Mlíkovský 1986, Mlíkovský and Švec 1989). For a previous review of the Tertiary avian localities of the Czech Republic see Mlíkovský (1992).

The stratigraphy used in the present paper follows Schmidt-Kittler (1987) for the Paleogene, and Mein (1990) for the Neogene, respectively. Museum acronyms are as follows:

DB: Z. Dvořák (private collection), Bílina, Czech Republic

DP FNŠP: Institute of Geology and Paleontology [formerly Department of Paleontology], Charles University, Praha, Czech Republic

MMB: Anthropos Institute, Moravian Museum, Brno, Czech Republic

MP: J. Mlíkovský (private collection), Praha, Czech Republic

NHMW: Naturhistorisches Museum, Wien, Austria

NMP: National Museum, Praha, Czech Republic

RMT: Regional Museum, Teplice, Czech Republic

ZW: H. Zapfe (private collection), Wien, Austria.

I thank Č. Bůžek, P. Čtyroký, O. Fejfar, I. Horáček and Z. Kvaček (all Praha) for the loan of material and/or supply of unpublished stratigraphical data.

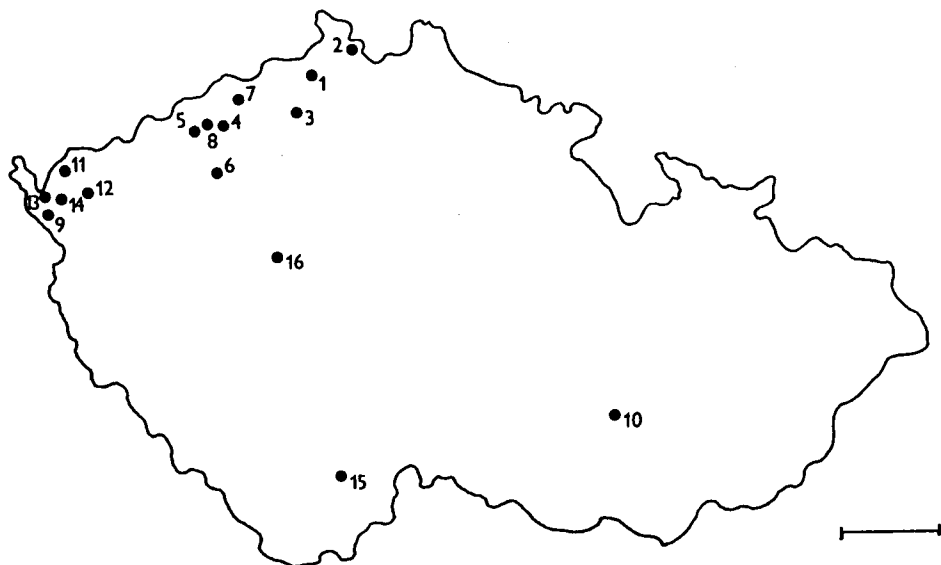


Fig. 1. Tertiary avian localities of the Czech Republic. The numbering of the localities corresponds with that in the text. Scale bar = 50 km.

LIST OF LOCALITIES

(1) BECHLEJOVICE

Location: Děčín County, North Bohemia. Early Oligocene, MP 22 (Fejfar and Kvaček 1993).

Avifauna: A feather imprint (Špinar 1986: 95, fig. 88c). The alleged bird bone from this locality reported by Špinar (1986: 95, fig. 88d) is not bone at all, but a leaf (Mlíkovský 1992). Deposited in DP FNŠP.

(2) VARNSDORF (Warnsdorf)

Location: Děčín County, North Bohemia. Middle Oligocene, MP ?23-24 (Konzalová 1981, Z. Kvaček, pers. communication).

Avifauna: Partial skeleton of indeterminate Ardeidae (Mlíkovský and Švec 1989), originally described as a duck (Bayer 1882, 1883). Deposited in NMP. Type locality of *Anas basaltica* Bayer 1882.

(3) SKALICE (Skalitz)

Location: Litoměřice County, North Bohemia. Middle Oligocene, MP ?23-24 (Konzalová 1981, Z. Kvaček, pers. communication).

Avifauna: Indeterminate bird bone remains (Mlíkovský and Švec 1989), originally described as a duck (Bayer 1882, 1883). Deposited in NMP. Type locality of *Anas skalicensis* Bayer 1882.

(4) SKYŘICE (Skiritz)

Location: Most County, North Bohemia. Early Miocene, MN ? (Č. Bůžek, pers. communication).

Avifauna: A few bones of the Anatidae (*Mionetta*) (Laube 1910, Mlíkovský 1992). Deposited in DP FNSP.

(5) AHNÍKOV

Location: Chomutov County, North Bohemia. Early Miocene, MN 3 (P. Čtyrský, pers. communication).

Avifauna: Partial humerus of an unidentified passerine bird (Mlíkovský 1992). Deposited in MP.

(6) TUCHOŘICE

Location: Louny County, North Bohemia. Early Miocene, MN 3 (Fejfar 1989, Mein 1990, Fejfar and Kvaček 1993).

Avifauna: Two endocranial casts ("fossil brains") and pedal phalanges of unidentified Accipitridae (Mlíkovský 1980, 1992). Deposited in DP FNSP.

(7) BŘEŠŤANY (Preschen)

Location: Teplice County, North Bohemia. Early Miocene, MN 3 (Fejfar and Kvaček 1993).

Avifauna: Bones of the Phalacrocoracidae (*Nectornis*), Ardeidae (indet.), Ciconiidae (indet.), and ?Scolopacidae (?*Tringa*) (Laube 1901, 1909, Mlíkovský and Švec 1989, Mlíkovský 1992). Deposited in NMP (most remains) and RMT (type of *Cygnus bilinicus*). The whereabouts of the holotype of *Totanus praecursor* is unknown (see Mlíkovský 1992). Type locality of *Cygnus bilinicus* Laube 1909, and *Totanus praecursor* Laube 1901.

(8) MERKUR (Merkur-Nord, Merkur-North, Merkur-sever, Nástup)

Location: Cheb County, West Bohemia. Early Miocene, MN 3 (Fejfar and Kvaček 1993).

Avifauna: Well preserved bones of the Phalacrocoracidae (indet.), Phasianidae (*Palaeortyx*), Strigidae (indet.), Psittacidae (*Archaeopsittacus*), Capitonidae (cf. *Capitonides*), Passeriformes (indet.), and as yet undetermined arboreal birds (J. Mlíkovský, unpub. results). The excavation of the locality is in progress. Deposited in DP FNSP and DB.

(9) DOLNICE

Location: Cheb County, West Bohemia. Early Miocene, MN 4b (Fejfar and Roček 1988, Fejfar 1989, Mein 1990, Fejfar and Kvaček 1993). Three layers were recognized by Fejfar (1974, Fejfar and Roček 1988), which yielded the same avifauna. Insignificant number of avian bone fragments came from the youngest layer (Dolnice 3). Bones of the two older layers (Dolnice 1 and 2) were mixed together by Švec, so that the avifauna is here treated as a unit (see J. Mlíkovský, in preparation, for details).

Avifauna: Very rich locality, which yielded 360 identifiable bones of birds from the following families and genera: Gaviidae (*Colymboides*, *Gavia*), Podicipedidae (*Miobaptus*), Phalacrocoracidae (*Nectornis*), Cracidae (*Taoperdix*), Phasianidae (*Palaeortyx*), Accipitridae (indet.), Falconidae (indet.), Phoenicopteridae (*Palaelodus*, *Phoenicopterus*), Anatidae (*Mionetta*, *Cygnus*, *Anser*, *Oxyura*), Gruidae (*Aramornis*), Rallidae (*Paraortygometra*), Jacanidae (*Nupharanassa*), Scolopacidae (*Tringa*, *Calidris*), Glareolidae (*Mioglareola*), Laridae (n.g., ?*Larus*, ?*Sterna*), Zygodactylidae (*Zygodactylus*), and an as yet undescribed family of passerine birds (Švec 1980, 1981, 1982, 1983, 1984, 1985, Švec and Mlíkovský 1986, J. Mlíkovský, in preparation). Overall, the recorded avifauna consists at least of 40 species (J. Mlíkovský, in preparation). Deposited in DP FNSP. Type locality of *Gavia egeriana* Švec 1982, *Miobaptus walteri* Švec 1982, *Microrallus fejfari* Švec 1983, and *Larus dolnicensis* Švec 1980. Further 5 species from the families Anatidae, Gruidae, Jacanidae, and from a new family of the Passeriformes will be described by Mlíkovský (in preparation).

(10) OŘECHOV

Location: Brno-venkov County, South Moravia. Early Miocene, MN 4 (Mein 1990, Fejfar and Kvaček 1993).

Avifauna: A few undetermined bird bones (Mlíkovský 1992). Deposited in MP.

(11) ZELENÁ

Location: Cheb County, West Bohemia. Early/middle Miocene, MN 4-5 (Č. Bůžek, pers. communication).

Avifauna: Imprints of two small indeterminate feathers (Mlíkovský 1992). Deposited in NMP.

(12) SOKOLOV

Location: Sokolov County, North Bohemia. Middle Miocene, MN 5 (cf. Fejfar and Kvaček 1993).

Avifauna: Indeterminate remains of a bird leg (Mlíkovský 1992). Deposited in DP FNŠP.

(13) FRANTIŠKOVY LÁZNĚ (Franzensbad)

Location: Cheb County, West Bohemia. Middle Miocene, MN 5 (Fejfar 1989, Mein 1990, Fejfar and Kvaček 1993).

Avifauna: Bones of the Gaviidae (*Gavia*), Phoenicopteridae (*Palaelodus*, *Phoenicopterus*), Anatidae (indet.), Rallidae (indet.), Scolopacidae (indet.), Laridae (indet.), Strigidae (cf. *Strix*), and Passeriformes (indet.) (J. Mlíkovský, unpub. results). Deposited in DP FNŠP.

(14) MOKŘINA (Krottensee)

Location: Cheb County, West Bohemia. Middle Miocene, MN 5 (cf. Obrhelová and Obrhel 1984).

Avifauna: Unidentified feather imprints (Novák 1877: 77-79, pl. II, fig. 13, pl. III, fig. 8). According to Novák (1877), geologist A.E. Reuss (1811-1873) collected also bird bones from this locality. Deposited in NMP (feather imprints). The whereabouts of the bones is unknown.

(15) LIŠOV

Location: České Budějovice County, South Bohemia. Middle Miocene, MN 7 (Fejfar and Kvaček 1993).

Avifauna: Cervical vertebra of a flamingo, *Palaelodus* (Mlíkovský, unpub. results). Deposited in DP FNŠP.

(16) SUCHOMASTY 3

Location: Beroun County, Central Bohemia. Late Miocene, MN 9 (Fejfar and Kvaček 1993), or MN 10 (Mein 1990).

Avifauna: Few indeterminate bones of passerine birds (J. Mlíkovský, unpub. results). Deposited in MP.

DISCUSSION

Most of the avian Tertiary localities of the Czech Republic are located near its western border along the eastern border of the Krušné Mountains. A geological fracture opened there in the mid-Paleogene and was flooded subsequently. Later, this fossil lake was

silted up (Obrhelová and Obrhel 1984), but created numerous lacustrine deposits, which yielded avian remains of the middle Oligocene to the middle Miocene age. Three of the localities (Merkur, Dolnice, and Františkovy Lázně) yielded numerous bird bones and rich avifaunas, and belong to the most important Miocene localities of Europe.

On the other hand, almost no Tertiary avian remains were found thus far in the karst deposits, which are common in the Czech Republic (Bosák *et al.* 1989).

REFERENCES

- Bayer F., 1882: O nových zbytcích zkamenělých ptáků z českého útvaru třetihorního (On new remains of fossil birds from the Czech Tertiary system). *Vesmír* 12: 20-21. (In Czech.)
- Bayer F., 1883: Über zwei neue Vogelreste aus der böhmischen Tertiärformation. *Sitzungsberichte der königlichen böhmischen Gesellschaft der Wissenschaften Prag* 1882: 60-65.
- Bosák P., Horáček I. & Panoš V., 1989: Paleokarst of Czechoslovakia. In: Bosák P., Ford D. C., Glazek J. & Horáček I. (Eds.), *Paleokarst: a systematic and regional review*. Praha: Academia, & Amsterdam: Elsevier, pp. 107-135.
- Fejfar O., 1974: Die Eomyiden und Cricetiden (Rodentia, Mammalia) des Miozäns der Tschechoslowakei. *Palaeontographica* 146: 100-180.
- Fejfar O., 1989: The Neogene vertebrate paleontology sites of Czechoslovakia: a contribution to the Neogene terrestrial biostratigraphy of Europe based on rodents. In: Lindsay E.H., Fahlbusch V. & Mein P. (Eds.), *European Neogene mammal chronology*. New York: Plenum Press, pp. 211-236.
- Fejfar O. & Kvaček Z., 1993: Tertiary basins in northwest Bohemia. Praha: Univerzita Karlova & Česká geologická společnost, 35 pp.
- Fejfar O. & Roček Z., 1988: The Lower Miocene vertebrate fauna of Dolnice, Cheb basin (western Bohemia, Czechoslovakia). *Acta Universitatis Carolinae (Geologica)* 1986: 233-249.
- Konzalová M., 1981: Boehlensipollis und andere Mikrofossilien des böhmischen Tertiärs (vulkanogene Schichtenfolge). *Sborník Geologických Věd (Paleontologie)* 24: 135-162.
- Laube G. C., 1901: Synopsis der Wirbeltierfauna der böhmischen Braunkohlenformation. *Abhandlungen des Deutschen Naturwissenschaftlichen Vereins in Böhmen "Lotos" Prag* 2 (4): 1-76.
- Laube G. C., 1909: Ein neuer Vogelrest aus den Tonen von Preschen bei Bilin. *Lotos* 57: 159-161.
- Laube G. C., 1910: Vogel- und Reptilienreste aus der Braunkohle von Skiritz bei Brůx. *Lotos* 58: 115-127.
- Mein P., 1990: Updating of MN zones. In: Lindsay E. H., Fahlbusch V. & Mein P. (Eds.), *European Neogene mammal chronology*. New York: Plenum Press, pp. 73-90.
- Mlíkovský J., 1980: Zwei Vogelgehirne aus dem Miozän Böhmens. *Časopis pro Mineralogii a Geologii* 25: 409-413.
- Mlíkovský J., 1992: The present state of knowledge of the Tertiary birds of Central Europe. In: Campbell K. E. (Ed.), *Studies in avian paleontology honoring Pierce Brodkorb*. *Natural History Museum of Los Angeles County (Science Series)* 36: 433-458.
- Mlíkovský J. & Švec P., 1989: Review of the Tertiary waterfowl (Aves: Anseridae) of Czechoslovakia. *Časopis pro Mineralogii a Geologii* 34: 199-203.

- Novák O., 1877: Fauna der Cyprisschiefer des Egerer Tertiärbeckens. *Sitzungsberichte der Mathematisch-Naturwissenschaftlichen Classe der Kaiserlichen Akademie der Wissenschaften* (Wien) (I) 76: 71-96.
- Obrhelová N. & Obrhel J., 1984: Biostratigrafie miocenního nadloží hlavní hnědouhelné sloje Chebska a Sokolovska [Biostratigraphy of the Miocene roof of the main brown coal seam of the Cheb and Sokolov regions]. *Acta Universitatis Carolinae (Geologica)* 3: 171-192. (In Czech.)
- Schmidt-Kittler N., 1987: European reference levels and correlation tables. In: Schmidt-Kittler N. (Ed.), International symposium on mammalian biostratigraphy and paleoecology of the European Paleogene. *Münchner Geowissenschaftliche Abhandlungen (A)* 10: 13-19.
- Špinar Z. V., 1986: Paleontologie (Paleontology). Praha: SNTL, 361 pp. (In Czech.)
- Švec P., 1980: Lower Miocene birds from Dolnice (Cheb basin), western Bohemia. *Časopis pro Mineralogii a Geologii* 25: 377-387.
- Švec P., 1981: Lower Miocene birds from Dolnice (Cheb basin), western Bohemia. Part II. *Časopis pro Mineralogii a Geologii* 26: 45-56.
- Švec P., 1982: Two new species of diving birds from the Lower Miocene of Czechoslovakia. *Časopis pro Mineralogii a Geologii* 27: 243-260.
- Švec P., 1983: Lower Miocene rail from western Bohemia (Ralliformes, Aves). *Věstník Ústředního Ústavu Geologického* 58: 31-38.
- Švec P., 1984: Further finds of grebe *Miobaptus walteri* in the Miocene of Bohemia. *Časopis pro Mineralogii a Geologii* 29: 167-170.
- Švec P., 1985: New finds of the small fossil loon, *Colymboides minutus* Milne-Edwards, 1867, from the Lower Miocene of western Bohemia. *Acta Universitatis Carolinae (Geologica)* 4: 447-455.
- Švec P. & Mlíkovský J., 1986: First Tertiary record of the genus *Oxyura* (Aves: Anseridae). *Časopis pro Mineralogii a Geologii* 31: 403-407.