

Late Miocene birds of Götzendorf/Leitha, Austria

By JIŘÍ MLÍKOVSKÝ¹⁾

(With 1 plate)

Manuscript submitted on November 6th 1989

Summary

A late Miocene (MN 10) avian thanatocenosis of Götzendorf an der Leitha, Lower Austria, is described. It is limited to two waterbird forms: *Anhinga pannonica* (Anhingidae) and *Dendronessa* (Anseridae).

Zusammenfassung

Eine ober-miozäne (MN 10) Vogelthanatozönose von Götzendorf an der Leitha, Niederösterreich, wurde beschrieben. Sie ist auf zwei Wasservogelformen beschränkt: *Anhinga pannonica* (Anhingidae, Schlangenhalsvögel) und *Dendronessa* (Anseridae, Entenvögel).

Introduction

Late Miocene birds have been reported from a limited number of localities in Central Europe, none of which yielded significant numbers of specimens (MLÍKOVSKÝ 1991). The newly discovered avian thanatocenosis of Götzendorf an der Leitha, Austria, is thus a welcome addition to our knowledge of the late Miocene avifauna in spite of being very small.

Anatomical nomenclature follows BAUMEL et al. (1979) throughout the present paper. Minimum numbers of individuals are calculated after GRAYSON (1984).

The described avian fossils were recovered from the southeastern part of the Vienna Basin in the sandpit Sassmann at Sandberg near Götzendorf an der Leitha, belonging to the municipality of Mannersdorf am Leithagebirge, Lower Austria. The area and its lithostratigraphy were described by BRIX (1989) and ZAPFE (1989). The sediments under discussion (clays and fine-grained sands) were deposited under limnofluviatile conditions. Vertebrate remains were found in a sand layer with mud pebbles, gravels and molluscs (predominantly *Congeria*, *Unio*, and *Planorbis*). The age of the deposit is late Miocene, MN 10 zone, according to micromammals (BACHMAYER & WILSON 1984). According to the geological situa-

¹⁾ Author's address: Jiří MLÍKOVSKÝ, Department of Evolutionary Biology, Czechoslovak Academy of Sciences, Sekaninova 28, CS-128 00 Praha 2. - Czechoslovakia.

tion and the molluscs, however, the deposit belongs to the early Pontian (LUEGER 1979, 1981; PAPP 1985), which can be correlated with the micromammalian zone MN 11 (cf. RÖGL & STEININGER 1983, STEININGER et al. 1987). Götzendorf is the type locality of PAPP's zone F (PAPP 1951, 1985; LUEGER 1979, 1981).

The investigated fossil materials were collected by Mr. H. SCHWENGBAUER, a private collector from Mannersdorf, and by the staff of the Naturhistorisches Museum Wien during an excavation in 1987. The avian bones described below are deposited in both of these collections.

Acknowledgments: For making available the materials, kind help and helpful discussions I am obliged to F. RÖGL (Wien), O. SCHULTZ (Wien) and H. SCHWENGBAUER (Mannersdorf). A. A. KARKHU (Moskva) allowed me to use the comparative collection of avian skeletons in the Paleontological Institute of the USSR Academy of Sciences in Moscow. Photographic credit is due to A. SCHUMACHER (Wien).

Systematic paleontology
Order Pelecaniformes SHARPE, 1891
Family Anhingidae RIDGWAY, 1887
Genus *Anhinga* BRISSON, 1760
***Anhinga pannonica* (LAMBRECHT, 1916)**
(Tab. 1, Figs. 1-5)

Material: Right humerus lacking proximal end (Naturhistorisches Museum Wien, 1990/26/1); distal part of left humerus (coll. H. SCHWENGBAUER, Mannersdorf, uncatalogued); MNI = 1.

Measurements: Width of mid-shaft = 8.8 mm, depth of mid-shaft = 6.8 mm.

Description: *Anhinga pannonica* was similar to the modern *Anhinga rufa*, but markedly larger.

Remarks: *Anhinga pannonica* has thus far been reported from late Miocene localities in Rumania (LAMBRECHT 1916), Tunisia (RICH 1972), ?Pakistan (HARRISON & WALKER 1982) and Austria (this paper). This indicates that it was widely distributed in the late Miocene of the Old World, although it is unknown both before and after this period. A similar fate appears to have been met by its New World counterpart. *Anhinga grandis* MARTIN & MENGEL, 1975 known to date only from the late Miocene of Nebraska (MARTIN & MENGEL 1975) and Florida (BECKER 1987). It is worth mentioning that while *Anhinga pannonica* belonged to the Old World aningas, *Anhinga grandis* was a representative of the New World aningas, so that both these phyletic lines of aningas parallelly developed large-sized forms during the late Miocene (MARTIN & MENGEL 1975).

Of the other Tertiary aningas, *Anhinga subvolans* (BRODKORB, 1956) is known from the early Miocene of Florida (BECKER 1986), while *Anhinga hadarensis* BRODKORB & MOURER-CHAUVIRÉ, 1982 was described from the late Pliocene of Ethiopia. The taxonomic position of the single Paleogene aninga *Protoplotus beauforti* LAMBRECHT, 1931 from the late Eocene or Oligocene of Sumatra was

confirmed during first revision (RICH & MARINO-HADIWARDYO 1977), but subsequent research led to the conclusion that this form should be transferred into a separate family (P. V. RICH in OLSON 1985).

Order Anseriformes LINNAEUS, 1758

Family Anseridae VIGORS, 1825

Genus *Dendronessa* WAGLER, 1832

Dendronessa sp.

(Tab. 1, Figs. 6–7)

Material: Cranial parts of two left coracoids, proximal part of right carpometacarpus (coll. H. SCHWENGBAUER, Mannersdorf).

Remarks: All these elements undoubtedly belong to the family Anseridae, but are too fragmentary and abraded to allow exact identification. Both the cranial coracoid fragments, however, show great resemblance to those of the perching ducks (Cairinini) in having (1) slender shaft, (2) deep sulcus musculi supracoracoidei, (3) robust head, (4) less flaring facies articularis humeralis and (5) nearly straight impressio ligamenti acrocoracohumeralis. Within the Cairinini they differ from *Chenonetta*, *Nettapus* and *Cheniscus* in having facies articularis humeralis grooved, from *Cairina* and *Aix* (sensu stricto) in having sulci musculi supracoracoidei nonpneumatized, and from *Amazonetta* and *Pteronetta* in having deep sulci musculi supracoracoidei. In all of these characters, the coracoid fragments agree with those of *Dendronessa*. I was not able to investigate the osteology of *Sarkidiornis*, the last cairinine genus, but WOOLFENDEN (1961) reported that it possess coracoids well different from those of *Dendronessa*. Thus, I assign these coracoids to *Dendronessa*. The carpometacarpus is indeterminate at the genus level and is listed here only tentatively.

The monotypic genus *Dendronessa* (*D. galericulata*) is currently limited to eastern Asia (JOHNSGARD 1978, KOLBE 1984), and its occurrence in the late Miocene of Europe is not surprising. Although an identification of the waterfowl remains from Götzendorf at the species level was not possible, the data available show that perching ducks of the genus *Dendronessa* inhabited late Miocene lakes of Central Europe. Of considerable interest is that a perching duck of a similar taxonomic position was recorded from the early Pliocene of Bulgaria (Z. BOEV in MOURER-CHAUVIRÉ 1988, A. A. KARKHU pers. communication).

Discussion

All five avian bones recovered in the late Miocene locality Götzendorf belong to waterbirds; this indicates the presence of a water body, probably a lake in the area. Anhingas are diving piscivorous birds, so that a sufficient area of open water and an abundance of large fishes (in correspondence to the large size of *Anhinga pannonica*) can be assumed.

References

- BACHMAYER, F. & R. W. WILSON (1984): Die Kleinsäugerfauna von Götzendorf, Niederösterreich. – Sitzungsber. Österr. Akad. Wiss., Math.-naturwiss. Kl., Abt. I., **193**: 303–319. – Wien.
- BAUMEL, J. J., A. S. KING, A. M. LUCAS, J. E. BREAZILE & H. E. EVANS (Eds., 1979): *Nomina anatomica avium*. – 637 pp. – London (Academic Press).
- BECKER, J. J. (1986): Reidentification of „*Phalacrocorax*“ *subvolans* Brodkorb as the earliest record of Anhingidae. – *Auk*, **103**: 804–808. – Washington.
- (1987): Additional material of *Anhinga grandis* Martin and Mengel (Aves: Anhingidae) from the late Miocene of Florida. – *Proc. biol. Soc. Washington*, **100**: 358–363. – Washington.
- BRIX, F. (1989): Zur Geologie und Lithostratigraphie der Sandgrube Götzendorf an der Leitha, Niederösterreich. – *Anz. österr. Akad. Wiss., Math.-naturwiss. Kl.*, **126**: 33–42. – Wien.
- BRODKORB, P. (1956): Two new birds from the Miocene of Florida. – *Condor*, **58**: 367–370. – Santa Clara.
- & C. MOURER-CHAUVIRÉ (1982): Fossil anhingas (Aves: Anhingidae) from early man sites of Hadar and Omo (Ethiopia) and Olduvai Gorge (Tanzania). – *Géobios*, **15**: 505–515. – Lyon.
- GRAYSON, D. K. (1984): Quantitative zooarchaeology. – 202 pp. – Orlando (Academic Press).
- HARRISON, C. J. O. & C. WALKER (1982): Fossil birds from the Upper Miocene of northern Pakistan. – *Tertiary Res.*, **4**: 53–69.
- JOHNSGARD, P. A. (1978) Ducks, geese and swans of the world. – 409 pp. – Lincoln (University of Nebraska Press).
- KOLBE, H. (1984) Die Entenvögel der Welt. – 382 pp. – Leipzig (Neumann).
- LAMBRECHT, K. (1916): Die Gattung *Plotus* im ungarischen Neogen. – *Jb. ungar. geol. Anst.*, **24**: 1–24. – Budapest.
- (1931): *Protoplotus beauforti* n. g. n. sp., ein Schlangenhalsvogel aus dem Tertiär von W.-Sumatra. – *Wetensch. Meded. Dienst Mijnbouw Nederlandsch-Indie*, **17**: 15–24.
- LUEGER, J. P. (1979): Überregionale Korrelationsmöglichkeiten mit Hilfe pannonischer und pontischer Landschnecken. – *Anz. österr. Akad. Wiss., Math.-naturwiss. Kl.*, 1979/6: 139–144. – Wien.
- (1981): Die Landschnecken im Pannon und Pont des Wiener Beckens. – *Denkschr. österr. Akad. Wiss., Math.-naturwiss. Kl.*, **120**: 1–124. – Wien.
- MARTIN, L. D. & R. M. MENGEL (1975): A new species of *Anhinga* (Anhingidae) from the upper Pliocene of Nebraska. – *Auk*, **92**: 137–140. – Washington.
- MLÍKOVSKÝ, J. (1991): The present state of knowledge of the Tertiary birds of Central Europe. – *Los Angeles County Mus., Contrib. Sci.*, in press. – Los Angeles.
- MOURER-CHAUVIRÉ, C. (Ed., 1988): Society of avian paleontology and evolution, *Information letter*, **2**: 1–22. – Lyon.
- (Ed., 1989): Society of avian paleontology and evolution, *Information letter*, **3**: 1–18. – Lyon.
- OLSON, S. L. (1985): The fossil record of birds. – In: D. S. FARNER, J. R. KING & K. C. PARKES (Eds.), *Avian biology*, **8**: 79–252. – New York (Academic Press).
- PAPP, A. (1951): Das Pannon des Wiener Beckens. – *Mitt. geol. Ges. Wien*, **39–41**/1946–1948: 99–193. – Wien.
- (1985): Wiener Becken: Anteil in Österreich. – In: A. PAPP & al. (Eds.): *M₆-Pannonien (Slavonien und Serbien)*. – *Chronostratigraphie und Neostatotypen*, **7**: 59–63. – Budapest (Akadémiai Kiadó).
- RICH, P. V. (1972): A fossil avifauna from the Upper Miocene Beglia formation of Tunisia. – *Notes Serv. géol. Tunis*, **35**: 29–66. – Tunis.
- & H. R. MARINO-HADIWARDYO (1977): *Protoplotus beauforti*, the world's oldest member of the bird family Anhingidae. – *Berita*, **9**: 101–102. – Bandung.
- ZAPPE, H. (1989): Pongidenzähne (Primates) aus dem Pontien von Götzendorf, Niederösterreich. – *Sitzungsber. österr. Akad. Wiss., Math.-naturwiss. Kl.*, **197**: 423–450. – Wien.



Avian remains from the late Miocene of Götzendorf/Leitha. 1-5 two partial humeri of *Anhinga pannonica* (LAMBRECHT, 1916); 6-7 two partial coracoids of cf. *Dendronessa* sp.; 8 fragmentary carpometacarpus of cf. *Dendronessa* sp.

Figs. 1-3: Naturhistorisches Museum Wien 1990/26/1; Figs. 4-8: Coll. H. SCHWENGBAUER, Mannersdorf am Leithagebirge, NÖ.