

First Tertiary record of the genus *Oxyura* (Aves: Anseridae)**První třetihorní nález rodu *Oxyura* (Aves: Anseridae)****(Czech summary)***(1 plate)*

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The hitherto oldest known fossil find (pars omalis of right coracoid) of the genus *Oxyura* is described from the Cypris Formation (early Miocene, Otnangian) of Dolnice near Cheb, West Bohemia, Czechoslovakia. With respect to the rather fragmentary state and uniqueness of the specimen, the description of a new fossil *Oxyura* species was avoided.

Introduction

The stiftail ducks, tribe Oxyurini, are a distinctive waterfowl group with eight living species (sensu Johnsgard 1979) inhabiting preferably tropical and subtropical inland lakes of all continents (Delacour 1959, Johnsgard 1978, Kolbe 1984).

Kašín (1978) erected a new name, Biziurini, for the tribe, supposing that the name Oxyurini Olphe-Gaillard 1887 is pre-occupied by Oxyuridae Cobbold 1864 (Nematoda). However, his action is incorrect for two reasons. First, Art. 55a of the International Code of Zoological Nomenclature (International Commission of Zoological Nomenclature 1985) states that if homonymous taxa of the family group are based on different generic names, as in this case (*Oxyura* Bonaparte 1828, and *Oxyuris* Rudolphi 1803, respectively), the correct name is determined by the Commission. Second, Kašín (1978) overlooked that von Boetticher (1950) had erected the name Heteronettini for *Heteronetta* Salvadori 1865, which is now commonly considered a member of Oxyurini. Heteronettini von Boetticher 1950 have then priority over Biziurini Kašín 1978. It is for these two reasons that we continue to apply the name Oxyurini to stiftail ducks.

Three to four Recent genera are usually recognized in the Oxyurini: *Heteronetta* Salvadori 1865, *Oxyura* Bonaparte 1828, *Biziura* Stephens 1824, and sometimes *Nomonyx* Ridgway 1880, which is, however, more often included in *Oxyura* (e.g., Delacour and Mayr 1945, von Boetticher 1952, Johnsgard 1975, 1978, 1979, Wolters 1975–1982, Kolbe 1984). *Thalassornis* Eyton 1838, since its description usually allied with stiftail ducks (Eyton 1838, Salvadori 1895, Reichenow 1913, Peters 1931, Delacour 1938, 1959, von Boetticher 1942, 1950, 1952, Delacour and Mayr 1945, and others), has been recently transferred to Dendrocygnini (Kear 1967, Johnsgard 1967, 1978, 1979, Raikow 1971, Wolters 1975–1982, Brush 1976, Kolbe 1984).

The extinct members of Oxyurini known so far include *Oxyura bessomi* Howard 1963 from the middle Pleistocene of California and Texas, *Oxyura zapatanima* Alvarez 1977 from the Pliocene/Pleistocene boundary of Mexico, and, perhaps, *Biziura delautouri* Forbes 1892a from the Holocene of New Zealand, which may be either synonymous with the Recent *Biziura lobata* (Shaw 1796) (Scarlett 1969, Harrison

and Walker 1970), or may represent its extinct New Zealand vicariant (Dawson 1958, Olson 1977b). *Biziura lautouri* Forbes 1892b is an objective synonym of *Biziura delautouri* Forbes 1892a (Howard 1964, Cowles 1970), and *Biziura exhumata* DeVis 1889 is synonymous with *Biziura lobata* (Shaw 1796) (Olson 1977a).

Systematic description

Order: Anseriformes Brisson 1760

Family: Anseridae Vigors 1825

Tribe: Oxyurini Olphe-Gaillard 1887

Genus: *Oxyura* Bonaparte 1828

Oxyura sp.

Material: Extremitas omalis coracoidei sin.; collections of the Department of Paleontology, Faculty of Science, Charles University, Praha, DP FNŠP 4828. Collected by Oldřich Fejfar and Petr Švec during summer 1980.

Locality: Freshwater lake deposits at Dolnice near Cheb, District Cheb, Cheb basin, West Bohemia, Czechoslovakia.

Horizon: Early Miocene (Ottngian), Cypris Formation, Dolnice layer 2. For a detailed description of the geology and stratigraphy of this locality see Fejfar (1974). Relatively extensive vertebrate fauna is already known from the Cypris Formation at Dolnice, including fishes (see Obrhelová and Obrhel 1983), amphibians (Špinar 1975), reptiles (Klembara 1979, 1983, Roček and Moody 1980, Rage and Roček 1983, Roček 1984, Mlynarski and Roček 1985), birds (Švec 1980, 1981, 1982, 1983, 1984, 1985), and mammals (Fejfar 1972, 1974).

Description: The coracoid under discussion agrees with Oxyurini and differs from all other waterfowl tribes in having: (1) facies articularis relatively narrow and elongated, (2) processus acroracoideus in cranial view thick and not flattened, and (3) the angle between the axis of processus acroracoideus and the axis of shaft nearly 90°.

Within Oxyurini it differs from the coracoid of *Nomonyx* in having the canalis triosseus relatively wide and open, and from *Biziura* in not having the area above the facies articularis humeralis in medial view bent ventrally (cf. Woolfenden 1961). Unfortunately, we were not able to examine coracoids of *Heteronetta*, the least specialized genus of Oxyurini (see Woolfenden 1961, Raikow 1970); however, because *Heteronetta* is osteologically intermediate between typical Oxyurini and dabbling ducks of the tribe Anatini (Woolfenden 1961) and the coracoid under discussion is, with the exceptions given above, in full agreement with typical Oxyurini, we do not hesitate to identify it as belonging in the genus *Oxyura*.

Table 1

Measurements (in mm) of *Oxyura* coracoids. $n = 1$ in each case

<i>Oxyura</i> sp.	Distance between proc. procoracoideus and proc. acroracoideus	Thickness of proc. acroracoideus	Depth of head through facies articularis humeralis
<i>O. leucocephala</i> *	10.0	3.7	4.9
<i>O. jamaicensis</i> **	8.5	2.8	4.1
<i>Oxyura</i> sp. (DP FNŠP 4828)	13.9	4.8	6.4

* Pleistocene specimen (unnumbered) in collections of the Geological Survey, Praha. *O. leucocephala* belongs to the largest recent *Oxyura* species.

** Recent specimen (PIN 1146-1) in collections of the Institute of Paleontology, Academy of Sciences of the USSR, Moskva. *O. jamaicensis* belongs to the smallest Recent *Oxyura* species.

In *Oxyura*, we could compare the coracoid under discussion with only two Recent species, *O. leucocephala* (Scopoli 1796) and *O. jamaicensis* (Gmelin 1789), from whose coracoids it differs in having: (1) sulcus m. procoracoidei markedly deeper, (2) medioventral part of the facies articularis less prominent over medioventral margin of canalis triosseus, and (3) in being generally larger and more robust. Although large size and great age indicate with sufficient probability that the coracoid under discussion belongs in a hitherto undescribed *Oxyura* species, we avoided naming it, because of the relative fragmentary state and uniqueness of the specimen.

Measurements: Overall length of the fragment 31.2 mm; for others see Table 1.

Remarks: The oldest member of Oxyurini known so far is *Oxyura zapatanima* Alvarez 1977 from the Pliocene/Pleistocene boundary of Jalisco, Mexico. *Oxyura* sp. described in the present paper thus extends the range of both the genus *Oxyura* and the whole tribe Oxyurini by about 20 m.y.

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References

- Alvarez R. (1977): A Pliocene avifauna from Jalisco, Mexico. — Contr. Mus. Paleont. (Univ. Mich.), 24, 205–220. Ann Arbor.
- Boetticher H. von (1942): Über die Einteilung der Familien der Entenvögel (Anatidae) in Unterfamilien und Sektionen. — Zool. Anz., 140, 37–48. Jena.
- (1950): Das System der Enten- und Gänsevögel. — Beitr. Gattungssyst. Vögel, 2, 40–48. Krefeld.
- (1952): Gänse- und Entenvögel aus aller Welt. — Geest & Portig. Leipzig.
- Brush A. H. (1976): Waterfowl feather proteins: analysis of use in taxonomic studies. — J. Zool., 179, 467–498. London.
- Cowles G. S. (1970): The original description by H. O. Forbes of the extinct New Zealand musk duck *Biziura delautouri*. — Bull. Brit. Ornithol. Club, 90, 166–168. London.
- Dawson E. W. (1958): Re-discoveries of the New Zealand subfossil birds named by H. O. Forbes. — Ibis, 100, 232–237. London.
- Delacour J. (1938): La systématique des Anatidés et leurs moeurs; pp. 225–242 in Jourdain F. C. R. (ed.) Proceedings of the Eighth international ornithological congress. — Oxford Univ. Press. Oxford.
- (1959): The waterfowl of the world. Volume 3. — Country Life. London.
- Delacour J. - Mäyr E. (1945): The family Anatidae. — Wilson Bull., 57, 3–55. Sioux City.
- DeVis C. W. (1889): Additions to the list of fossil birds. — Proc. Roy. Soc. Qd, 6, 55–58. Brisbane.
- Eyton T. C. (1838): A monograph on the Anatidae or duck tribe. — Longman, Orme, Brown, Green, Longman & Eddowes. London.
- Fejfar O. (1972): Ein neuer Vertreter der Gattung *Anomalomys* Gaillard, 1900 (Rodentia, Mammalia) aus dem europäischen Miozän (Karpat). — Neu. Jb. Geol. Paläont., Abh., 141, 168–193. Stuttgart.
- (1974): Die Eomyiden und Cricetiden (Rodentia, Mammalia) des Miozäns der Tschechoslowakei. — Palaeontographica, Abt. A, 146, 100–180. Stuttgart.
- Forbes H. O. (1892a): On a recent discovery of the remains of extinct birds in New Zealand. — Nature, 45, 416–418. London.
- (1892b): Preliminary notice of additions to the extinct avifauna of New Zealand. — Trans. Proc. N.Z. Inst., 24, 185–189. Wellington.
- Harrison C. J. O. - Walker C. A. (1970): The extinct musk duck (*Biziura*) of New Zealand: a reappraisal of *B. lautouri*. — Bull. Brit. Ornithol. Club, 90, 6–10. London.
- Howard H. (1963): Fossil birds from the Anza-Borrego Desert. — Los Angeles Co., Mus., Contrib. Sci., 73, 1–33. Los Angeles.

- Howard H. (1964): Fossil Anseriformes, In: J. Delacour (ed.): The waterfowl of the world. 4, 233–326. Country Life, London.
- Johnsgard P. A. (1967): Observations on the behavior and relationships of the white-backed duck and the stiff-tailed ducks. — Wildfowl Trust annu. Rep., 18, 98–107. Slimbridge.
- (1975): Waterfowl of North America. — Indiana University Press. Bloomington.
- (1978): Ducks, geese and swans of the world. — University of Nebraska Press. Lincoln.
- (1979): Order Anseriformes; In: E. Mayr - G. W. Cottrell (eds.) Check-list of birds of the world. 1, 425–506. — Museum of Comparative Zoology. Cambridge.
- Kašim G. N. (1978): O novom nazvanii dlja triby savkovych [On a new name for the tribe of stiff-tail ducks]; p. 177 only in A. M. Sudilovskaja - V. E. Flint (eds.) Pticy i presmykajuščiesja [Birds and reptiles]. — Izd. Mosk. Univ. Moskva.
- Kear J. (1967): Notes on the eggs and downy young of *Thalassornis leuconotus*. — Ostrich, 38, 227–229. Cape Town.
- Klembara J. (1979): Neue Funde der Gattungen *Ophiosaurus* und *Anguis* (Squamata, Reptilia) aus dem Untermiozän Westböhmens (ČSSR). — Věst. Ústř. Úst. geol., 54, 163–169. Praha.
- (1983): Beitrag zur Kenntnis der Subfamilie *Anguinae* (Reptilia, Anguinae). — Acta Univ. Carol., Geol., 2, 121–168. Praha.
- Kolbe H. (1984): Die Entenvögel der Welt. 3. verb. Aufl. — Neumann Verlag, Radebeul.
- Młynarski M. - Roček Z. (1985): Chelonians (Reptilia: Testudines) from the Lower Miocene locality Dolnice (Bohemia, Czechoslovakia). — Čas. Mineral. Geol., 30, 4, 397–407. Praha
- Obrhelová N. - Obrhel J. (1983): Paläoölimnologie und Paläoökologie des westböhmisches miozänen Sees im Lichte der Paläoichthyologie. — Z. geol. Wiss., 11, 853–887. Berlin.
- Olson S. L. (1977a): The identity of the fossil ducks described from Australia by C. W. DeVis. — Emu, 77, 127–131. Melbourne.
- (1977b): Notes on subfossil Anatidae from New Zealand, including a new species of pink-eared duck *Malacorhynchus*. — Emu, 77, 132–135. Melbourne.
- Peters J. L. (1931): Check-list of birds of the world. Volume 1. — Harvard Univ. Press. Cambridge.
- Rage J. C. - Roček Z. (1983): *Dolniceophis lehmani* (Serpentes, Colubridae), a new fossil snake from the Lower Miocene of Czechoslovakia. — Čas. Mineral. Geol., 28, 1, 17–21. Praha.
- Raikow R. J. (1970): Evolution of diving adaptations in the stiff-tail ducks. — Univ. Calif. Publ. Zool., 94, i–iv, 1–52. Berkeley.
- (1971): The osteology and taxonomic position of the white-backed duck, *Thalassornis leuconotus*. — Wilson Bull., 83, 270–277. Sioux City.
- Reichenow A. (1913): Die Vögel: Handbuch der systematischen Ornithologie. Band 1. — Ferdinand Enke. Stuttgart.
- Roček Z. (1984): Lizards (Reptilia: Sauria) from the Lower Miocene locality Dolnice (Bohemia, Czechoslovakia). — Academia. Praha.
- Roček Z. - Moody S. (1980): *Chamaeleo caroliquarti* (Chamaeleonidae, Sauria): a new species from the Lower Miocene of central Europe. — Věst. Ústř. Úst. geol., 55, 2, 85–92. Praha.
- Salvadori T. (1895): Catalogue of the Chenomorphae (Palamedeae, Phoenicopterii, Anseres), Crypturi, and Ratitae in the Collections of the British Museum. — Order of the Trustees, London.
- Scarlett R. (1969): The occurrence of the musk duck. *Biziura lobata* (Shaw), in New Zealand. — Notornis, 16, 57–59. Wellington.
- Špinar Z. V. (1975): *Miopolobates fejfari* n. sp., a new representative of the family Pelobatidae (Anura) from the Miocene of Czechoslovakia. — Věst. Ústř. Úst. geol., 50, 1, 41–46. Praha.
- Švec P. (1980): Lower Miocene birds from Dolnice (Cheb basin), western Bohemia. — Čas. Mineral. Geol., 25, 4, 377–387. Praha.
- (1981): Lower Miocene birds from Dolnice (Cheb basin), western Bohemia, part II. — Čas. Mineral. Geol., 26, 1, 45–56. Praha.
- (1982): Two new species of diving birds from the Lower Miocene of Czechoslovakia. — Čas. Mineral. Geol., 27, 3, 243–260. Praha.
- (1983): Lower Miocene rail from western Bohemia (Ralliformes, Aves). — Věst. Ústř. Úst. geol., 58, 1, 31–38. Praha.

- Švec P. (1984): Further finds of grebe *Miobaptus walteri* in the Miocene of Bohemia. — Čas. Mineral. Geol., 29, 2, 167–170. Praha.
- (1985): New finds of the small fossil loon, *Colymboides minutus* Milne-Edwards, 1867, from the Lower Miocene of western Bohemia. — Acta Univ. Carol., Geol., 4, 447–455. Praha.
- Wolters H. E. (1975–1982): Die Vogelarten der Erde. (Anseriformes: pp. 93–99, 1976.) — Paul Parey. Hamburg.
- Woolfenden G. (1961): Postcranial osteology of the waterfowl. — Bull. Florida State Mus., Biol. Sci., 6, 1–129. Gainesville.
- International Commission of Zoological Nomenclature (1985): Code international de nomenclature zoologique/International code of zoological nomenclature. 3rd. ed. — International Trust for Zoological Nomenclature, London.

První třetihorní nález rodu *Oxyura* (Aves: Anseridae)

V předložené práci je z cyprisové formace spodního miocénu (ottnang) Dolnice u Chebu (Západočeský kraj) popsán první nález rodu *Oxyura* (pars *omalis* pravého korakoidu) a tím zároveň i první nález celého tribu Oxyurini z doby starší než pleistocén. Známe stáří těchto taxonů se tak prodloužilo o přibližně 20 milionů let. Od pojmenování nálezu jako nového druhu bylo vzhledem k jeho fragmentárnosti a ojedinělosti upuštěno.

RECENZE

J. V. Pinneker (edit.): **Občaja gidrogeologija.** 1. svazek Osnovy gidrogeologii. — 231 str. Nauka, sibiřské oddělení. Novosibirsk, 1980.

Účelem tohoto kompendia je shrnutí dosavadních poznatků o určení nových cest v poznávání zákonitosti pohybu podzemní vody, její geneze a zvláště pak zákonu interakce mezi vodou, plynem, horninou a organickou hmotou.

V úvodní kapitole se mj. pojednává o hydrogeologické terminologii. Konstatuje se v ní, že hydrogeologie jako vědní obor již přešla od etapy sběru dat k fázi objasňující jednotlivé jevy. Hydrogeologie je podle definice G. V. Bogomolova věda o interakci podzemní vody s pevnými a plynými látkami. Hydrogeologie zkoumá vývoj podzemní hydrosféry, její zásoby a složení, zákonitosti prostorového rozmístění jejích komponent, v ní probíhající procesy o vzájemném působení s okolními sférami zeměkoule, ale i hospodářský význam složek podzemní hydrosféry a její vliv na lidskou činnost.

Ve druhé kapitole se pojednává o podzemní hydrosféře. Celkový objem hydrosféry (včetně povrchové vody a atmosféry) se odhaduje na 1 400 mil. m³ vody. F. A. Makarenko odhaduje v pětikilometrové zóně zemské kůry na 86 400 km³, z toho volně 13 700 (16,2%), fyzikálně vázané

35 800 (42,4) a chemicky vázané 34 900 (41,4 %). Nejmodernější odhad je od V. F. Derpogolca; objem vody ve vrstvě mocné 35 km na kontinentech a 4,7 km pod oceány je 1 050 mil. km³.

Podle A. F. Lebeděva se podzemní voda dělí na vodu v plynném skupenství (pára), hydroskopickou, molekulárně vázanou, gravitační, pevnou a chemicky vázanou. J. V. Pinneker vymezuje ještě vodu v nadkritickém stavu, kdy není rozdíl mezi vodou a párou. Dále se pojednává o podzemní vodě v pórových a puklinových kolektorech.

Ve třetí kapitole o původu podzemní hydrosféry se mj. uvádí genetická klasifikace. Hlavní skupiny jsou exogenní a endogenní. Exogenní se dělí na meteogenní a sedimentogenní. Endogenní pak na metamorfogenní a magmatogenní. V historii podzemní vody dochází ke směšování různých typů vlivem ascenze a descenze.

Ve čtvrté kapitole o koloběhu se uvádí několik definic a závěrem vlastní rozdělení na hydrologický (klimatický) a geologický koloběh. Oba druhy se postupně popisují.

Pátá kapitola je věnována podzemním zvodnělým systémům. Ve smyslu N. K. Ignatoviče se oddělují skupiny struktur podle otevřenosti, podle průtočnosti a podle promytosti. Z hlediska typu cirkulujících podzemních vod se rozlišují hydrogeologické pánve (pánve s vrstevnými vodami)



Coracoid DP FNSP 4828 of an undescribed *Oxyura* species from early Miocene of Dolnice, Czechoslovakia *a* — lateral view, *b* — posterior view, *c* — medial view. Scale bar equals 10 mm