

Paleobiogeography of Crown Deer

Roman Croitor

Table S2. Bibliographic sources that provided the data on fossil deer biostratigraphic and zoogeographic distribution and predicted body mass (see Table S1).

-
- Abbazzi, L. 2001. Cervidea and Moschidae (Mammalia, Artiodactyla) from the Baccinello V-3 assemblage (Late Miocene, Late Turolian, Grosseto, Italy). *Rivista Italiana di Paleontologia e Stratigrafia*, **107** (1): 107-123.
- Abdrakhmanova, L.T. 1974. Fossil ruminants of Karabastuz. *Contributions to history of fauna and flora of Kazakhstan*, **5**: 83-89.
- Alcaraz, M.A., 2010. Sistemática y evolución de los cérvidos (Mammalia, Artiodactyla) del Pleistoceno de las áreas extraan-dinas de Argentina. Doctoral dissertation, Universidad Nacional de La Plata, La Plata.
- Alcaraz, A., Ferrero, B.S., Noriega, J.I. 2005. Primer registro de *Antifer ultra* Ameghino 1889 (Artiodactyla: Cervidae) en el Pleistoceno de Entre Ríos. *INSUGEO Miscelánea*, **14**: 65-70.
- Anderson, A.E., Wallmo, O.C. 1984. *Odocoileus hemionus*. *Mammalian species*, **219**: 1-9.
- Aubekerova, P.A. 1974. Pliocene artiodactyls from southeastern Kazakhstan. *Paleontological Journal*, **1974** (4): 92-100.
- Aung, T.H., Marwick, B., Conrad, C. 2015. Palaeolithic zooarchaeology in Myanmar: a review and future prospects. *Journal of Indo-Pacific Archaeology*, **39**: 50-56.
- Azanza, B. 2000. Los Cervidae (Artiodactyla, Mammalia) del Mioceno de las Cuencas del Duero, Tajo, Calatayud-Teruel y Levance. *Memorias del Museo Paleontológico de la Universidad de Zaragoza*, **8**: 1-376.
- Azanza, B., Montoya, P. 1995. A new deer from the lower Turolian of Spain. *Journal of Paleontology*, **69** (6): 1163-1175.
- Azzaroli A., Mazza P. 1992. The cervid genus *Eucladoceros* in the early Pleistocene of Tuscany. *Palaeontographia Italica*, **79**: 43-100.
- Azzaroli, A. 1992. The cervid genus *Pseudodama* n. g. in the Villafranchian of Tuscany. *Palaeontographia Italica*, **79**: 1-41.
- Biswas, S., Sonakia, A. 2001. Some fossils of deer from the Quaternary deposits of Madhya Pradesh, India. *Journal of the Palaeontological Society of India*, **46**: 43-49.
- Boeskorov, G. G. 2001. *The systematics and origin of the modern moose*. Novosibirsk: Nauka Publishing House, 120 p. (in Russian).
- Bondarev A.A., Tesakov A.S. Simakova A.N., Dorogov A.L. 2017. Reindeer (*Rangifer*) from Early Pleistocene of the South of Western Siberia. In: Bogdanov et al. (Eds.): *Integrative Palaeontology: Development*

Prospects for Geological Objectives, Material of the LXIII Session of the Palaeontological Society (April, 3-7, 1917, Sankt-Peterburg): 173-175 (in Russian).

Cabrera, A. 1929. Sobre los ciervos fósiles sudamericanos llamados *Paraceros* y *Morenelaphus*. *Memorias de la Real Sociedad Española de Historia Natural*, **15**: 53-64.

Chimento, N.R., Zuccari, J.I., Marchetto, J.M., Berbach, L. 2019. Nuevos restos de ciervos (Cervidae, Mammalia) para el Pleistoceno de la Región Pampeana (Argentina): consideraciones paleobiogeográficas y paleoecológicas. *Revista Brasileira de Paleontologia*, **22** (1): 67-85.

Cisneros, J.C. 2005. New pleistocene vertebrate fauna from El Salvador. *Revista Brasileira de Paleontologia*, **8** (3): 239-255.

Croitor, R. 2016. Systematical position and paleoecology of the endemic deer *Megaceroides algericus* Lydekker, 1890 (Cervidae, Mammalia) from the late Pleistocene-early Holocene of North Africa. *Geobios*, **49** (4): 265-283.

Croitor, R. 2017. Description of a new deer species (Cervidae, Mammalia) from the Early Pliocene of Eastern Europe, with a review of early dispersals and palaeobiogeography of the subfamily Cervinae. *Neues Jahrbuch für Geologie und Paläontologie - Abhandlungen*, **283** (1): 85-108.

Croitor, R. 2018. *Plio-Pleistocene deer of western Palearctic: taxonomy, systematics, phylogeny*. Chişinău: Institute of Zoology of the Academy of Sciences of Moldova, 140 p.

Croitor, R. 2021. Early evolutionary radiation and diversity of the Old World telemetacarpal deer (Capreolinae, Cervidae, Mammalia). *Neues Jahrbuch für Geologie und Paläontologie-Abhandlungen*, **300** (1): 33-67.

Croitor, R., Abbas, S.G., Babar, M.A., Khan, M.A., 2021. A new deer species (Cervidae, Mammalia) from the upper Siwaliks (Pakistan). *Quaternary International*, **595**: 1-11.

Croitor, R., Khan, M.A., Abbas, S.G., Babar, M.A., Asim, M., Akhtar, M. 2022. Description of new Pliocene to Early Pleistocene deer (Cervidae, Mammalia) remains from the Siwalik Hills in Pakistan with a discussion on paleobiogeography of cervids from the Indian subcontinent. *Geobios*. <https://doi.org/10.1016/j.geobios.2022.08.001>

Croitor, R., Robinson, C. 2020. A revision of "*Cervus*" *punjabiensis* Brown, 1926 (Cervidae, Mammalia) from the Upper Siwaliks of Chandigarh, India. *Quaternary International*, **550**: 147-158.

Croitor, R., Zakharov, D., Mararescul, V. 2020. Deer from the Early Pliocene Prioziornoe, Kuchurgan River Valley (Moldova, Eastern Europe). *Neues Jahrbuch für Geologie und Paläontologie-Abhandlungen*, **297** (3): 325-367.

Di Stefano, G. 1996. The Mesopotamian fallow deer (*Dama*, Artiodactyla) in the Middle East Pleistocene. *Neues Jahrbuch für Geologie und Paläontologie – Abhandlungen*, **199** (3): 295-322.

Dong, W. 1993. The fossil record of deer in China. In: Ōtaishi, N., Sheng, H., Eds. *Deer of China: biology and management*, Elsevier: Amsterdam, The Netherlands, pp. 95-102.

Dong, W. 2007. New material of Muntiacinae (Artiodactyla, Mammalia) from the Late Miocene of the northeastern Qinghai-Tibetan Plateau, China. *Comptes Rendus Palevol*, **6** (5): 335-343.

- Dong, W., Bai, W.P., Pan, Y., Liu, W.H., 2020. New material of Cervidae (Artiodactyla, Mammalia) from Xinyaozi Ravine in Shanxi, North China. *Vertebrata Palasiatica*, **58**: 221-248.
- Dong, W., Hu, Ch. 1994. The Late Miocene Cervidae from Hounao, Yushe Basin, Shanxi. *Vertebrata Palasiatica*, **32(3)**: 209-227.
- Dong, W., Ji, X.-P., Jablonski, N.G., Su, D.F., Li, W.-Q. 2014. New materials of the Late Miocene Muntiacus from Zhaotong hominoid site in southern China. *Vertebrata Palasiatica*, **52 (3)**: 316-327.
- Dong, W., Jiang, P. 1993. The Late Pleistocene Cervoidea (Artiodactyla) from Xianren Cave, Ji'an, Jilin. *Gujizhui dongwu xuebao*, **31 (2)**: 117-131.
- Dong, W., Li, Zh.-Y. 2008. Late Pleistocene Artiodactyla (Mammalia) from the Lingjing Site, Xuchang, Henan Province (China). *Vertebrata Palasiatica*, **46 (1)**: 31-50.
- Dong, W., Liu, W., Li-Min, Zhang, L., Cai, B. 2018. New materials of Cervidae (Artiodactyla, Mammalia) from Tuchengzi of Huade, Nei Mongol, North China. *Vertebrata Palasiatica*, **56 (2)**: 157-175.
- Dong, W., Liu, J., Pan, Y., 2003. A new *Euprox* from the Late Miocene of Yuanmou, Yunnan Province, China, with interpretation of its paleoenvironment. *Chinese Science Bulletin*, **48 (5)**: 485-491.
- Dong, W., Pan, Y., Liu, J. 2004. The earliest *Muntiacus* (Artiodactyla, Mammalia) from the Late Miocene of Yuanmou, southwestern China. *CR Palevol*, **3 (5)**: 379-386.
- Dong, W., Wei, Q., Bai, W., Zhang, L., Liu, W., Chen, Z., Bai, Y. and Wu, Y., 2019. New material of the Early Pleistocene *Elaphurus* (Artiodactyla, Mammalia) from North China and discussion on taxonomy of *Elaphurus*. *Quaternary International*, **519**: 113-121.
- Dong, W., Ye, J. 1996. Two new cervid species from the Late Neogene of Yushe basin, Shanxi Province, China. *Vertebrata Palasiatica*, **34 (2)**: 135-144.
- Gaudry, A. 1872. Sur des ossements d'animaux quaternaires que M. l'abbé David a recueillis en Chine. *Bulletin de la Société géologique de France*, Ser. 2, **29**: 177-179.
- Gonzalez, E., Labarca, R., Chavez-Hoffmeister, M., Pino, M., 2014. First fossil record of the smallest deer cf. *Pudu* Molina, 1782 (Artiodactyla, Cervidae), in the Late Pleistocene of South America. *Journal of Vertebrate Paleontology*, **34 (2)**: 483-488.
- Gunnell, G.F., Foral, A., 1994. New species of *Bretzia* (Cervidae; Artiodactyla) from the latest Pleistocene or earliest Holocene of Nebraska and South Dakota. *Journal of Mammalogy*, **75 (2)**: 378-381.
- Gustafson, E.P. 2015. An Early Pliocene North American deer: *Bretzia pseudalces*, its osteology, biology, and place in cervid history. *Bulletin of the Museum of Natural History, University of Oregon* 25: 1-75.
- Heintz, E. 1970. Les cervidés villafranchiens de France et d'Espagne. *Mémoires du Muséum national d'histoire naturelle. Série C, Sciences de la terre*, **22 (1)**: 1-303 + *Figures et tableaux (2)*: 1-206.
- Hooijer, D.A., Granger, W. 1951. Two new deer from the Pleistocene of Wanhhsien, Szechwan, China. *American Museum novitates*, **1495**: 1-18.
- Hu, C.K. 1962. A new species of *Metacervulus* of Yushe, Shansi, with notes on Pliocene muntjaks of China. *Vertebrata Palasiatica*, **6 (3)**: 251-261.

- Johnson, R. 1874. Notice of a New Species of Deer from the Norfolk Forest-Bed. *The Annals and Magazine of Natural History*, ser. 4, **13 (73)**: 1-4.
- Kahlke, H.-D. 1969. Die Cerviden-Reste aus den Kiesen von Süßenborn bei Weimar. *Palaeontologische Abhandlungen. Abteilung A, Palaeozoologie*, **3 (3/4)**: 367-788.
- Kahlke, H.-D. 2001. Neufunde von Cerviden-Resten aus dem Unterpleistozän von Untermassfeld. Das Pleistozän von Untermassfeld bei Meningen (Thüringen), Teil 2. *Monographien des Römisch-Germanischen Zentralmuseums Mainz*, **40 (2)**: 461-482.
- Korotkevich, E.L. 1971. New form of deer from the Neogenic deposits of the South Ukraine. *Vestnik Zoologii*, **1971 (1)**: 59-63 (in Russian).
- Korotkevich, E.L. 1974. New representative of the genus *Procapreolus* from the territory of the North Black Sea Area. *Vestnik zoologii*, **6**: 68-77 (in Russian).
- Korotkevich, E.L. 1970. *Late Neogene Deer of the North Black Sea Area*. Kyiv: Naukova Dumka, 175 p. (in Russian).
- Leslie Jr, D.M., Lee, D.N., Dolman, R.W. 2013. *Elaphodus cephalophus* (Artiodactyla: Cervidae). *Mammalian Species*, **45 (904)**: 80-91.
- Lopatin, A.V., Maschenko, E.N., Vislobokova, I.A., Serdyuk, N.V., Dac, L.X. 2021. Pleistocene mammals from the Lang Trang Cave (Vietnam): new data. *Doklady Biological Sciences*, **496 (1)**: 1-4.
- Louys, J., Curnoe, D., Tong, H., 2007. Characteristics of Pleistocene megafauna extinctions in Southeast Asia. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **243 (1-2)**: 152-173.
- Lungu, A., Rzebik-Kowalska, B. 2011. *Faunal assemblages, stratigraphy and taphonomy of the Late Miocene localities in the Republic of Moldova*. Krakow: Polish Academy of Sciences, 62 p.
- Ma, S., Wang, Y., Xu, L. 1986. Taxonomic and phylogenetic studies on the genus *Muntiacus*. *Acta Theriologica Sinica*, **6 (3)**: 191-209.
- Macarovici, N. 1962. Contribution à la connaissance de *Alces palmatus* Ham. Smith dans le Quaternaire de la Roumanie. *Eiszeitalter und Gegenwart*, **12**: 66-72.
- Meiri, M., Lister, A.M., Collins, M.J., Tuross, N., Goebel, T., Blockley, S., Zazula, G.D., van Doorn, N., Dale Guthrie, R., Boeskorov, G.G., Baryshnikov, G.F. 2014. Faunal record identifies Bering isthmus conditions as constraint to end-Pleistocene migration to the New World. *Proceedings of the Royal Society B: Biological Sciences*, **281 (1776)**: p.20132167
- Pidoplichko, I.G., Flerov, K.K. 1952. New form of deer from the Pliocene of South Ukraine. *Reports of the Academy of Sciences of USSR*, **84**: 1239-1242 (in Russian).
- Rădulescu, C., Samson, P. 1967. Sur un nouveau cerf mégacérin du pléistocène moyen de la dépression de Brasov (Roumanie). *Geologica Romana*, **6**: 317-344.
- Roberts, P., Delson, E., Miracle, P., Ditchfield, P., Roberts, R.G., Jacobs, Z., Blinkhorn, J., Ciochon, R.L., Fleagle, J.G., Frost, S.R., Gilbert, C.C. 2014. Continuity of mammalian fauna over the last 200,000 y in the Indian subcontinent. *Proceedings of the National Academy of Sciences*, **111 (16)**: 5848-5853.

- Rotti, A.; Vezzosi, R.I.; Mothé, D.; dos Santos Avilla, L. 2021. Rising from the ashes: The biggest South American deers (Cetartiodactyla: Cervidae) once roamed Northeast Brazil. *Journal of South American Earth Sciences*, **108**: 103-154.
- Rusconi, C. 1934. Tercera noticia sobre los vertebrados fosiles de Las Arenas Puelchenses de Villa Ballester. *Anales de la Sociedad Científica Argentina*, **117-118**: 28-30.
- Schlosser, M. 1924. Tertiary vertebrates from Mongolia. *Geological Survey of China, Series C*, **1 (1)**: 1-119.
- Smith, W.P. 1991. *Odocoileus virginianus*. *Mammalian species*, **388**: 1-13.
- Stimpson, C.M., Utting, B., O'Donnell, S., Huong, N.M., Kahlert, T., Manh, B.V., Khanh, P.S. and Rabett, R.J. 2019. An 11 000-year-old giant muntjac subfossil from Northern Vietnam: implications for past and present populations. *Royal Society open science*, **6 (3)**: 181461.
- Suraprasit, K., Jaeger, J.J., Chaimanee, Y., Chavasseau, O., Yamee, C., Tian, P., Panha, S. 2016. The middle Pleistocene vertebrate fauna from Khok Sung (Nakhon Ratchasima, Thailand): biochronological and paleobiogeographical implications. *ZooKeys*, **613**: 1-157.
- Teilhard de Chardin, P., Piveteau, J. 1930. Les mammifères fossiles de Nihowan (Chine). *Annales de Paléontologie*, **19**: 3-132.
- Teilhard de Chardin, P., Trassaert, M. 1937. The Pliocerie Camelidae, Giraffidae, and Cervidae of South Eastern Shansi. *Palaeontologia Sinica, N. Ser. C*, **1**: 1-69.
- Titov, V.V., Shvyreva, A.K. 2016. Deer of the Genus *Megaloceros* (Mammalia, Cervidae) from the Lower Pleistocene of Ciscaucasia. *Paleontological Journal*, **2016 (1)**: 82-90.
- Tomiasi, C., Abbazzi, L. 2002. Deer fauna from Pleistocene and Holocene localities of Ecuador (South America). *Geobios*, **35 (5)**: 631-645.
- Van der Made, J. 2019. The dwarfed “giant deer” *Megaloceros matritensis* n. sp. from the Middle Pleistocene of Madrid-a descendant of *M. savini* and contemporary to *M. giganteus*. *Quaternary International*, **520**: 110-139.
- Villavicencio Figueroa, N.A. 2016. *Late Quaternary Megafaunal Extinctions in South America: Chronology, environmental changes and human impacts at regional scales*. Doctoral dissertation, University of California, Berkeley.
- Vislobokova I., Dmitrieva E., Kalmykov N. 1995. Artiodactyls from the Late Pliocene of Udunga, Western Trans-Baikal, Russia. *Journal of Vertebrate Paleontology*, **15 (1)**: 146-159.
- Vislobokova, I.A. 1990. The fossil deer of Eurasia. *Transactions of Paleontological Institute*, **240**: 1-208 (in Russian).
- Vislobokova, I.A., 1983. The fossil deer of Mongolia. *Transactions of Joint Soviet-Mongolian Paleontological Expedition*, **23**: 5-77.
- Vislobokova, I.A. 2009. A new species of Megacerini (Cervidae, Artiodactyla) from the late Miocene Taralyk-Cher, Tuva (Russia), and remarks on the relationships of the group. *Geobios*, **42**: 397-410.

- Vislobokova, I.A. 2012. Giant Deer: Origin, Evolution, Role in the Biosphere. *Paleontological Journal*, **46** (7): 643-775.
- Wang, L.H., Zhang, Z.-Q. 2014. Late Miocene *Cervavitus novorossiae* (Cervidae, Artiodactyla) from Lantian, Shaanxi Province. *Vertebrata Palasiatica*, **52** (3): 303-315.
- Webb, S.D. 2000. Evolutionary History of New World Cervidae. In: E.S. Vrba and G.B. Schaller (eds.), *Antelopes, Deer, and Relatives*, 38-64. Yale University Press, New Heaven – London.
- Wei, Q. 1983. A new *Megaloceros* from Nihowan Beds. *Vertebrata Palasiatica*, **21** (1): 87-95.
- Zaim, Y., de Vos, J., Huffman, O.F., Aziz, F., Kappelman, J., Rizal, Y., 2003. A new antler specimen from the 1936 Peking hominid site, East Jawa, Indonesia, attributable to *Axis lydekkeri* (MARTIN, 1886). *Journal of Mineral Technology*, **10** (2): 45-52.
- Zdansky, O. 1925. Fossile Hirsche Chinas. *Palaeontologica Sinica, Series C*, **2** (3): 1-94.
- Zhang, B., Chen, X., Tong, H.W. 2018. Tooth remains of Late Pleistocene moschid and cervid (Artiodactyla, Mammalia) from Yangjiawan and Fuyan Caves of southern China. *Quaternary International*, **490**: 21-32.
-