Lower and Middle Cenomanian ammonites from the Morondava Basin, Madagascar.

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Lower and Middle Cenomanian ammonites from the Morondava Basin, Madagascar

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ABSTRACT

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Lower and Middle Cenomanian ammonite assemblages have been collected on a bed-by-bed basis from localities at Vohipaly and Mahaboboka, Madagascar, as well as from outcrops around Berekata, all in the Morondava Basin, southwest Madagascar. These collections demonstrate the presence of the upper Lower Cenomanian Mantelliceras dixoni Zone and the lower Middle Cenomanian Cunningtoniceras inerme Zone of the north-western European standard sequence. These records indicate that the striking anomalies in the zonal assemblages of the classic divisions of the Madagascan Cenomanian are based on mixed assemblages, rather than a succession that differs radically from that elsewhere in the world. The dixoni Zone fauna is: Desmoceras cf. latidorsatum (Michelin, 1838), Pachydesmoceras kossmati Matsumoto, 1987, Forbesiceras sp., F. baylissiWright & Kennedy, 1984, F. largilliertianum (d'Orbigny, 1841), Mantelliceras cantianum Spath, 1926a, M. dixoni Spath, 1926b, M. mantelli (J. Sowerby, 1814), M. picteti Hyatt, 1903, M. saxbii (Sharpe, 1857), Sharpeiceras sp., S. falloti (Collignon, 1931), S. mocambiquense (Choffat, 1903), S. cf. florencae Spath, 1925, Acompsoceras renevieri (Sharpe, 1857), A. tenue Collignon, 1964, Calycoceras sp., Mrhiliceras lapparenti (Pervinquière, 1907), Mariella (Mariella) stolizcai (Collignon, 1964), Hypoturrilites taxyfabreae (Collignon, 1964), Turrilites scheuchzerianus Bosc, 1801, Sciponoceras cucullatum Collignon, 1964, and Sciponoceras antanimangaensis (Collignon, 1964). The presence of Calycoceras in a Lower Cenomanian association represents a precocious appearance of a genus typically Middle and Upper Cenomanian in occurrence, and matches records from Tunisia. The inerme Zone yields a more restricted assemblage: Pachydesmoceras kossmati, Forbesiceras baylissi, Acanthoceras sp. juv., Cunningtoniceras cunningtoni (Sharpe, 1855) and Hypoturrilites taxyfabreae.

Keywords:

Madagascar; Morondava Basin; Cenomanian; Ammonite succession; Ammonite zonation; Chronostratigraphy

Aly, F., Abdel-Gawad and Gabir, M.A. 2005. Uppermost Albian- basal Cenomanian ammonites from North Sinaia, Egypt. Egyptian Journal of Palaeontology, 5, 347-385.

Amédro, F., Cobban, W.A., Breton, G. and Rogron, P. 2002. Metengonoceras teigenense Cobban et Kennedy, 1989: une ammonite exotique d'origine Nord-Américaine dans le Cénomanien inférieur de Basse-Normandie (France). Bulletin Trimestrielle de la Société Géologique de Normandie et Amis du Muséum du Havre, 87, 5-25. [for 2000]

Atabekian, AA. 1985. Turrilitids of the late Albian and Cenomanian of the southern part of the USSR. Trudy Mezhvedomstvennogo Stratigraficheskogo Komiteta SSSR, 14, 112 pp. [In Russian] Besairie, H. and Collignon, M. 1960. Lexique Stratigraphique International, 4, 2, Madagascar (supplément), 1-190.

Böhm, J. 1895. Review of A. de Grossouvre: Recherches sur la craie supérieure. 2nd

part. Neues Jahrbuch für Mineralogie, Geologie und Paläontologie, 1895, 360-366.

Bosc, L.A.G. 1801. (An. 13). In Roissy, F. Histoire Naturelle générale et particulière, des Mollusques, Animaux sans vertebrès et à sang blanc. Ouevrage faisant suit aux Oeuvres de Leclerc de Buffon, et partie du Cours complet d'Histoire naturelle, rédigé par C.S. Sonnini, membre de plusiers Sociétés savants. Continué par. F. de Roissy. viii + 448 + 3 p. Déterville; Paris.

Breistroffer, M. 1947. Sur les zones d'ammonites dans l'Albien de France et d'Angleterre. Travaux du Laboratoire de Géologie de l'Université de Grenoble, 26, 17-104. [1-88 in separates]

Brongniart, A. 1822. Sur quelques terrains de Craie hors du Bassin de Paris, 80-101. In: Cuvier, G. and Brongniart, A. Description géologique des environs de Paris, 3rd edn. 428 pp. Dufour and d'Ocagne; Paris.

Choffat, P. 1903. Contributions à la connaissance géologique des colonies portugaises d'Afrique. I, le Crétacique de Conducia. Commission du Service Géologique de Portugal, 32 pp.

Collignon, M. 1931. Paléontologie de Madagascar, XVI. La faune du Cénomanien à fossiles pyriteux du nord de Madagascar. Annales de Paléontologie, 20, 43-104 (1-64).

Collignon, M. 1937. Ammonites Cénomaniennes du sudouest de Madagascar. Annales géologiques du Service des Mines de Madagascar, 8, 29-72.

Collignon, M. 1961. Ammonites néocrétacées du Menabe (Madagascar). VII, Les Desmoceratidae. Annales Géologiques du Service des Mines de Madagascar, 31, 115 pp.

Collignon, M. 1964. Atlas des fossiles caracteristiques de Madagascar (Ammonites), XI Cenomanien: xi + 152 pp. Service Géologique; Tananarive.

Coquand, H. 1862. Géologie et paléontologie de la région de la Province de Constantine. Mémoires de la Société d'Émulation de la Provence, 2, 1-341.

Delamette, M. and Kennedy, W.J. 1991. Cenomanian ammonites from the condensed deposits of the Helvetic Domain. Journal of Paleontology, 65, 435-465.

Diener, C. 1925. Ammonoidea neocretacea. Fossilium Catalogus (1: Animalia), 29, 244 pp.

Dixon, F. 1850. The Geology and Fossils of the Tertiary and Cretaceous Formations of Sussex. 1st Edn., xxxii + 423 pp. W.J. Smith; Brighton.

Dubourdieu, G. 1953. Ammonites nouvelles des Monts du Mellègue. Bulletin du

Service de la Carte Géologique de l'Algerie. 1e série, Paléontologie, 16, 76 pp.

Gale, A.S., Bown, P., Caron, M., Crampton, J., Crowhurst, S. J., Kennedy, W.J., Petrizzo, M.R. and Wray, D.S. 2011. The uppermost Middle and Uppper Albian succession at the Col de Palluel, Hautes-Alpes, France: an integrated study (ammonites, inoceramid bivalves, planktonic foraminifera, nannofossils, geochemistry, stable oxygen and carbon isotopes, cyclostratigraphy). Cretaceous Research , 37, 59-130.

Gauthier, H. 2006. Révision Critique de la Paléontologie Française d'Alcide d'Orbigny, 6, Céphalopodes Crétacés. 1-292 +1-662. Backhuys; Leiden.

Gill, T. 1871. Arrangement of the Families of Mollusks. Smithsonian Miscellaneous Collections, 227, xvi + 49 pp.

Grossouvre, A. de 1894. Recherches sur la craie supérieure, 2, Paléontologie. Les ammonites de la craie supérieure. Mémoires du Service de la Carte Géologique détaillée de la France, 1-264 (mislabeled 1893).

Hayakawa, H. and Nishino, T. 1999. Cenomanian ammonite fauna from Nakagawa, Hokkaido, Japan. Bulletin of Nakagawa Museum of Natural History, 2, 1-40.

Hayakawa, H. and Takahashi, T. 2000. Sharpeiceras (Cretaceous acanthoceratid) from Nakagawa, Hokkaido. Bulletin of the Nagakawa Museum of Natural History, 3, 7-14.

Howarth, M.K. 1985. Cenomanian and Turonian ammonites from the Novo Redondo area, Angola. Bulletin of the British Museum (Natural History) Geology, 39, 73-105.

Hyatt, A. 1894. Phylogeny of an Acquired Characteristic. Proceedings of the American Philosophical Society, 32, 349-647.

Hyatt, A. 1900. Cephalopoda, pp. 502-604. In: Zittel, K.A. von 1896-1900, Textbook of Palaeontology, transl. Eastman, C.R. Macmillan; London and New York.

Hyatt, A.1903. Pseudoceratites of the Cretaceous. United States Geological Survey Monograph, 44, 1-351.

Immel, H. and Seyed-Emami, K. 1985. Die Kreideammoniten des Glaukonitkalkes (O. Alb- O. Cenoman) des Kolah - Qazi - Gebirges sudöstlich von Esfahan (Zentral Iran). Zitteliana, 12, 87-137.

Jukes-Browne, A.J. 1896. VI. Critical remarks on some of the fossils. In: Jukes-Browne, A.J. and Hill, W. A delimitation of the Cenomanian: being a comparison of the corresponding beds in southwestern England and northern France. Quarterly Journal of the Geological Society of London, 52, 99-178.

Kaplan, U., Keller, S. and Wiedmann, J. 1984. Ammoniten - und Inoceramen - Gliederung des Norddeutschen Cenoman. Schriftenreihe Erdwissenchaftlichte Komission, 7, 307-347.

Kaplan, U., Kennedy, W.J., Lehmann, J., and Marcinowski, R. 1998. Stratigraphie und Ammonitenfaunen des westfälischen Cenoman. Geologie und Paläontologie in Westfalen , 51, 236 pp.

Kawabe, F., Takashima, R., Wani, R., Nishi, H. and Moriya, K. 2003. Upper Albian to Lower Cenomanian biostratigraphy in the Oyubari area, Hokkaido, Japan: towards a Cretaceous biochronology for the North Pacific. Acta Geologica Polonica, 53, 81-91.

Kennedy, W.J. 1971. Cenomanian ammonites from southern England. Special Papers in Palaeontology, 8, v + 133 pp.

Kennedy, W.J. 1994. Cenomanian ammonites from Cassis, Bouches-du-Rhône, France. Palaeopelagos, Special Volume, 1, 209-254.

Kennedy, W.J., Amédro, F., Robaszynski, F. and Jagt, J.W.M. 2011. Ammonite faunas from condensed Cenomanian- Turonian sections ('Tourtias') in southern Belgium and northern France. Netherlands Journal of Geosciences, 90, 209-223.

Kennedy, W.J. and Bilotte, M. 2009. A revision of the cephalopod fauna of the 'niveau rouge' of the Selva de Bonansa, Huesca Province, northern Spain. Bulletin of the Moscow Society of Naturalists, 84, 39-70.

Kennedy, W.J. and Juignet, P. 1993. A revision of the ammonite faunas of the type Cenomanian. 4. Acanthoceratinae (Acompsoceras, Acanthoceras, Protacanthoceras, Cunningtoniceras and Thomelites). Cretaceous Research, 14, 145-190.

Kennedy, W.J., Juignet, P. and Wright, C.W. 1986. A revision of the ammonite fauna of the type Cenomanian. 3. Mantelliceratinae. Cretaceous Research, 7, 19-62.

Kennedy, W.J. and Latil, J.-L. 2007. The Upper Albian ammonite succession in the Montlaux section, Hautes-Alpes, France. Acta Geologica Polonica, 57, 453-478.

Kennedy, W. J. and Wright, C.W. 1985. Mrhiliceras gen. nov. (Cretaceous Ammonoidea), a new Cenomanian mantellicerine. Neues Jahrbuch für Geologie und Paläontologie Monatshefte, 1985, 513-526.

Klinger, H.C. and Kennedy, W.J. 1997. Cretaceous faunas from Zululand and Natal, South Africa. The ammonite family Baculitidae Gill, 1871 (Excluding the genus Eubaculites). Annals of the South African Museum, 105, 1-206.

Klinger, H.C. and Kennedy, W.J. 2001. Stratigraphic and geographic distribution,

phylogenetic trends and general comments on the ammonite family Baculitidae Gill, 1871 (with an annotated list of species referred to the family). Annals of the South African Museum, 107, 1-290.

Korn, D., Ebbighausen, V., Bockwinkel J. and Klug, C. 2003. The A-mode ontogeny in prolecanitid ammonites. Palaeontology, 46, 1123-1132.

Kossmat, F. 1895-1898. Untersuchungen über die Sudindische Kreideformation. Beiträge zur Paläontologie Österreich- Ungarens und des Orients, 9 (1895), 97-203 (1-107); 11 (1897), 1-46 (108-153); 11(1898), 89-152 (154-217).

Kullmann, J. and Wiedmann, J. 1970. Significance of sutures in phylogeny of Ammonoidea. University of Kansas, Paleontological Contributions, 42, 1-32.

Lamarck, J.P.B.A. de M. de 1801. Système des Animaux sans vertebrès. vii + 432 pp. The author; Deterville, Paris.

Langius C.N. [Lang K.] 1708. Historia lapidum figuratorum Helvetiae. 165 pp. Haeredes Gottofredi Hautt and Joannem Jodocum Halter; Lucerne.

Lewy, Z. and Raab, M. 1978. Mid-Cretaceous stratigraphy of the Middle East. Annales du Muséum d'Histoire Naturelle de Nice, 4 (for 1976), XXXII, 14 pp.

Mantell, G.A. 1822. The fossils of the South Downs; or illustrations of the geology of Sussex. xvi + 327 pp. Lupton Relfe; London.

Marcinowski, R. and Wiedmann, J. 1990. The Albian ammonites of Poland. Palaeontologica Polonica, 50, 94 pp.

Matheron, P. 1842. Catalogue méthodique et descriptif des corps organisés fossiles du département des Bouches-du- Rhône et lieux circonvoisins. Répetoire des travaux de la Société de Statistique de Marseille, 6, 269 pp.

Matsumoto, T. 1987. Note on Pachydesmoceras, a Cretaceous ammonite genus. Proceedings of the Japan Academy , series B, 63, 5-8.

Matsumoto, T. 1988. A monograph of the Puzosiidae (Ammonoidea) from the Cretaceous of Hokkaido. Palaeontological Society of Japan Special Papers, 30, 1-179.

Matsumoto, T., Hayakawa, H. and Toshimitsu, S. 1999. An ammonite species of Sharpeiceras from Madagascar. Bulletin of the Mikasa City Museum, 3, 17-21.

Matsumoto, T. and Kawashita, Y. 1998. Two ammonite species of the genus Sharpeiceras from the Cretaceous of Hokkaido. Paleontological Research, 2, 89-95.

Matsumoto, T. and Nishida, T. 2002. A study of Mrhiliceras (Cretaceous Ammonoidea). Proceedings of the Japan Academy, series B, 78, 185-189.

Matsumoto, T. and Toshimitsu, S. 1998. On some species of Sharpeiceras (Ammonoidea) from the Cretaceous of Hokkaido. Bulletin of the Geological Survey of Japan, 49, 621-631.

Matsumoto, T. and Toshimitsu, S. 2005. Additional notes on some species of Mantelliceras (Ammonoidea) from Central Hokkaido, North Japan. Bulletin of the Geological Survey of Japan, 56, 31-36.

Michelin, H. 1838. Note sur une argile dépendant du Gault, observée au Gaty, commune de Gérodot, département de l'Aube. Mémoires de la Société Géologique de France, (1), 3, 97-103.

Mosavina, A. and Wilmsen, M. 2011. Cenomanian Acanthoceratoidea (Cretaceous Ammonoidea) from the Koppeh Dagh, NE Iran: taxonomy and stratigraphic implications. Acta Geologica Polonica 61, 175-192.

Neumayr, M. 1875. Die Ammoniten der Kreide und die systematik der Ammonitiden. Zeitschrift der Deutschen Geologischen Gesellschaft, 27, 854-942.

Nishida, T., Matsumoto, T., Yokoi, K., Kawashita, Y., Kyuma, Y., Egashira, N., Aizawa, J., Maiya, S., Ikuji, Y. and Yao, A. 1996. Biostratigraphy of the Cretaceous Middle Yezo Group in the Soeushinai area of Hokkaido-with special reference to the transitional part from the Lower to Upper Cretaceous. Journal of the Faculty of Education, Saga University, 44, 65-149. [In Japanese with English abstract]

Nowak, J. 1908. Untersuchungen über Cephalopoden der Oberen Kreide in Polen. I. Teil, Genus Baculites. Bulletin International de l'Academie des Sciences de Cracovie Classe des Sciences Mathématiques et Naturelles, Série B: Sciences Naturelles for 1908, 326-353.

Nowak, J. 1916. Über die bifiden Loben der oberkretazischen Ammoniten und ihre Bedeutung für die Systematik. Bulletin International de l'Académie des Sciences de Cracovie. Classe des Sciences Mathématiques et Naturelles, Série B: Sciences Naturelles for 1915, 1-13.

Orbigny, A. d'. 1840-1842. Paléontologie française: Terrains crétacés. 1. Céphalopodes. 1-120 (1840); 121-430 (1841); 431-662 (1842). Masson; Paris.

Passy, A. 1832. Description géologique du département de la Seine-inférieure. xvi + 371 pp. Nicétas Periaux; Rouen.

Pervinquière, L. 1903. Étude géologique de la Tunisie centrale. Carte Géologique de la Tunisie, viii + 359 pp. de Rudeval; Paris.

Pervinquière, L. 1907. Études de paléontologie tunisienne. 1. Céphalopodes des terrains secondaires. Carte Géologique de la Tunisie, v + 438pp.

Pictet, F. J. and Campiche, G. 1858-1864. Description des fossiles du terrain crétacé des environs de Saint-Croix part 2 (1). Description des fossiles. Matériaux pour la Paléontologie Suisse (2) part 1, 1-380; part 2, 1-752.

Reboulet, S., Giraud, F., Colombié, C. and Carpentier, A. 2013. Integrated stratigraphy of the Lower and Middle Cenomanian in a Tethyan section (Blieux, southeast France) and correlations with the Boreal basins. Cretaceous Research, 40, 170-189.

Robaszynski, F., Caron, M., Amédro, F., Dupuis, C., Hardenbol, J. Gonzáles Donoso, J.M., Linares, D. and Gartner, S. 1994. Le Cénomanien de la région de Kalaat Senan (Tunisie Centrale). Révue de Paléobiologie, 12, 351-505.

Schlüter, C. 1871-1876. Cephalopoden der oberen deutschen Kreide. Palaeontographica, 21, 1-24, (1871); 21, 25-120(1872); 24, 1-144 (121-264) + x(1876).

Sharpe, D. 1853-57. Description of the fossil remains of Mollusca found in the Chalk of England. I, Cephalopoda. Palaeontographical Society Monographs. 68 pp. 1-26 (1853); 27-36 (1855); 37-68 (1857).

Shumard, B.F. 1860. Observations upon the Cretaceous strata of Texas. Transactions of the Academy of Sciences of St. Louis, 1, 582-590.

Sornay, J. 1965. La faune d'inocérames du Cénomanien et du Turonien du Sud-Ouest de Madagascar. Annales de Paléontologie, Invertebrès, 51, 1-18.

Sowerby, J. 1812-1822. The Mineral Conchology of Great Britain. 1, pls 1-9 (1812), pls 10-44 (1813, pls 45-78 (1814), pls 79-102 (1815); 2, pls 103-14 (1815), pls 115-50 (1816), pls 151-86 (1817), pls 187-203 (1818); 3, pls 204-21 (1818), pls 222-53 (1819), pls 254-71 (1820), pls 272-306 (1821); 4, pls 307-18 (1821), pls 319-83 (1822). The Author; London, Spath, L.F. 1922 On the Senonian ammonite fauna of Pondoland. Transactions of the Royal Society of South Africa, 10, 113-147.

Spath, L.F. 1925. On Upper Albian Ammonoidea from Portuguese East Africa, with an appendix on Upper Cretaceous ammonites from Maputoland. Annals of the Transvaal Museum, 11, 179-200.

Spath, L.F. 1926a. On new ammonites from the English Chalk. Geological Magazine, 63, 77-83.

Spath, L.F. 1926b. On the zones of the Cenomanian and the uppermost Albian. Proceedings of the Geologists' Association , 37, 420-432.

Stoliczka, F. 1863-1866. The fossil cephalopoda of the Cretaceous rocks of southern India. Ammonitidae with revision of the Nautilidae etc. Memoirs of the Geological Survey of India. (1), Palaeontologica Indica, 3, (1), 41-56(1863); (2-5), 57-106(1864); (6-9), 107-154(1865); (10-13), 155-216(1866).

Szives, O. 2007. Albian Stage. Geologica Hungarica, 57, 75-122.

Thomel, G. 1972. Les Acanthoceratidae Cénomaniens des châines subalpines méridionales. Mémoires de la Société Géologique de France, (N.S.), 116, 204 pp.

Thomel, G. 1992. Ammonites du Cénomanien et du Turonien du Sud-Est de la France. 1, 1-422; 2, 1-383. Editions Serre; Nice.

Venzo, S. 1936. Cefalopodi del Cretaceo medio-superiore dello Zululand. Palaeontographia Italica, 36, 59-133 (1-75).

Walaszczyk, I., Kennedy, W.J., Dembicz, K., Gale, A.S., Praszkier, T., Rasoamiaramanana, A.H. and Randrianaly, H. 2014. Ammonite and inoceramid biostratigraphy and biogeography of the Cenomanian through basal Middle Campanian (Upper Cretaceous) of the Morondava Basin, western Madagascar. Journal of African Earth Sciences 89, 79-132.

Wiedmann, J. 1966. Stammesgeschichte und System der posttriadischen Ammonoideen; ein Überblick. Neues Jahrbuch für Geologie und Paläontologie Abhandlungen , 125, 49-79; 127, 13-81.

Wiedmann, J. and Dieni, I. 1968. Die Kreide Sardiniens und ihre Cephalopoden. Palaeontographia Italica, 64, 1-171.

Wiedmann, J. and Schneider, H.L. 1979. Cephalopoden und Alter der Cenoman-Transgression von Mülheim-Broich, SW-Westfalen. In: Wiedmann, J. (Ed.), Aspekte der Kreide Europas, International Union of Geological Sciences (A), 6, 645-680.

Wilmsen, M. 1997. Some notes on the Cenomanian cephalopod fauna of the North Cantabrian Basin. Freiberger Forschungsheft, C468, 319-331.

Wilmsen, M., Wood, C. J. Niebuhr, B. and Kaplan, U. 2009. Cenomanian-Coniacian ammonoids of the Danubian Cretaceous Group (Bavaria, southern Germany). Schriftenreihe der Deutschen Gesellschaft für Geowissenschaften, 65, 111-124.

Wright, C.W. 1952. A classification of the Cretaceous Ammonites. Journal of Paleontology, 26, 213-222.

Wright, C.W. and Kennedy, W.J. 1984. The Ammonoidea of the Lower Chalk. Part 1. Palaeontographical Society Monographs, 1-126.

Wright, C.W. and Kennedy, W.J. 1987. The Ammonoidea of the Lower Chalk. Part 2. Palaeontographical Society Monographs, 127-218.

Wright, C.W. and Kennedy, W.J. 1995. The Ammonoidea of the Lower Chalk. Part 4. Palaeontographical Society Monographs, 295-319.

Wright, C.W. and Kennedy, W.J. 1996. The Ammonoidea of the Lower Chalk. Part 5. Palaeontographical Society Monographs, 320-403.

Wright, C.W. and Wright, E.V. 1951. A survey of the fossil Cephalopoda of the Chalk of Great Britain. Palaeontographical Society Monographs, 1-40.

Zaborski, P.M.P. 1985. Upper Cretaceous ammonites from the Calabar region, southeast Nigeria. Bulletin of the British Museum (Natural History) Geology, 39, 1-72.

Zittel, K.A. Von. 1884. Handbuch der Palaeontologie. 1, Abt. 2; Lief 3, Cephalopoda. p. 329-522. R. Oldenbourg; Munich & Leipzig.

Zittel, K.A. Von. 1895. Grundzüge der Palaeontologie (Palaeozoologie). vii + 972 pp. R. Oldenbourg; Munich & Leipzig.

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