

Palaeodromites crypticus, a new early-middle Cenomanian dynomenid crab (Crustacea, Decapoda) from southern Belgium

by John W.M. JAGT, Barry W.M. VAN BAKEL & René H.B. FRAAIJE

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Abstract

A single, well-preserved specimen of a new dynomenid crab, *Palaeodromites crypticus* n. sp., is described from the lower Bernissart Calcirudites Formation (= 'Tourtia de Tournai'), as formerly exposed at the Delwart quarry, Tournai (southern Belgium). Although superficially similar to contemporaneous *P. incertus* (BELL, 1863), carapace outline, structure and number of anterolateral teeth and dorsal surface ornament differ to such an extent that introduction of a new taxon appears warranted. The new species probably represents an offshoot of the *P. sinuosulcatus*-*P. incertus* lineage, which ranged from the lower Albian (*Leymeriella regularis* Subzone) to the uppermost Cenomanian (*Actinocamax plenus* Beds of authors), with records from England, France, eastern Germany and Austria.

Keywords: Crustacea, Decapoda, Brachyura, Dynomenidae, new species, Cenomanian, Belgium.

Résumé

Un spécimen bien préservé et unique d'un nouveau crabe dynoméniidé *Palaeodromites crypticus* n. sp. est décrite dans la partie inférieure de la Formation des Calcirudites de Bernissart (= 'Tourtia de Tournai'), telle qu'exposée autrefois dans la carrière de Delwart à Tournai (Belgique méridionale). Bien que cette espèce soit superficiellement similaire au contemporain *P. incertus* (BELL, 1863), les contours de la carapace, la structure et le nombre des dents antérolatérales ainsi que l'ornementation de la surface dorsale diffèrent tellement qu'il nous semble justifié de désigner un nouveau taxon. Cette espèce nouvelle représente probablement un rameau de la lignée *P. sinuosulcatus*-*P. incertus*, qui s'étendait de l'Albien inférieur (Sous-zone à *Leymeriella regularis*) au Cénomanién sommital (les Couches à *Actinocamax plenus* de certains auteurs), avec des découvertes en Angleterre, en France, en Allemagne de l'est et en Autriche.

Mots-clés: Crustacea, Decapoda, Brachyura, Dynomenidae, espèce nouvelle, Cénomanién, Belgique.

Introduction

Crabs of early Cenomanian to middle Turonian age from southwestern Belgium (see Fig. 1) appear to be exceedingly rare. We are aware of a single record only, by FORIR (1887, p. 162 [44], pl. 7, figs 3-5), who described a new species, *Dromiopsis gigas*, from the so-called 'Tourtia de Tournai', on the basis of two (partial) carapaces and five isolated, fragmentary chelipeds, collected by Baron de Ryckholt. Although FORIR (1887, p. 167 [49]) noted that these specimens bore registration numbers 4936 and 4937 in the 'collections minérales de l'Université de Liège' [*sic*], they could not be located there a few years ago, and thus were presumed lost.

Later (November 2003), in the basement of the Institut royal des Sciences naturelles de Belgique (IRScNB, Brussels), one of us (JWMJ) came across two large drawers containing decapod crustaceans received on loan from other institutes by the late VICTOR VAN STRAELEN, which apparently had not been returned after his death. Amongst this material are the type carapaces of *Dromiopsis gigas*, as well as isolated chelipeds held to be conspecific by FORIR. These specimens will be revised elsewhere (JAGT *et al.*, in prep.); their preservation suggests them to have come from a comparable, yet darker coloured, unit to the coarse-grained facies which has yielded the new species described herein. The new specimen had not been properly registered and sat on a shelf for several decades. Fortunately, a label was found associated, and the rock type is clearly that of the 'Tourtia de Tournai'.

The Cenomanian-Turonian strata in the Mons Basin have yielded but few crustacean remains. This crustacean paucity is puzzling since from southern England in particular diverse faunas are known from this time interval (WRIGHT & WRIGHT, 1950; WRIGHT & COLLINS, 1972; WRIGHT, 1997). It may be caused

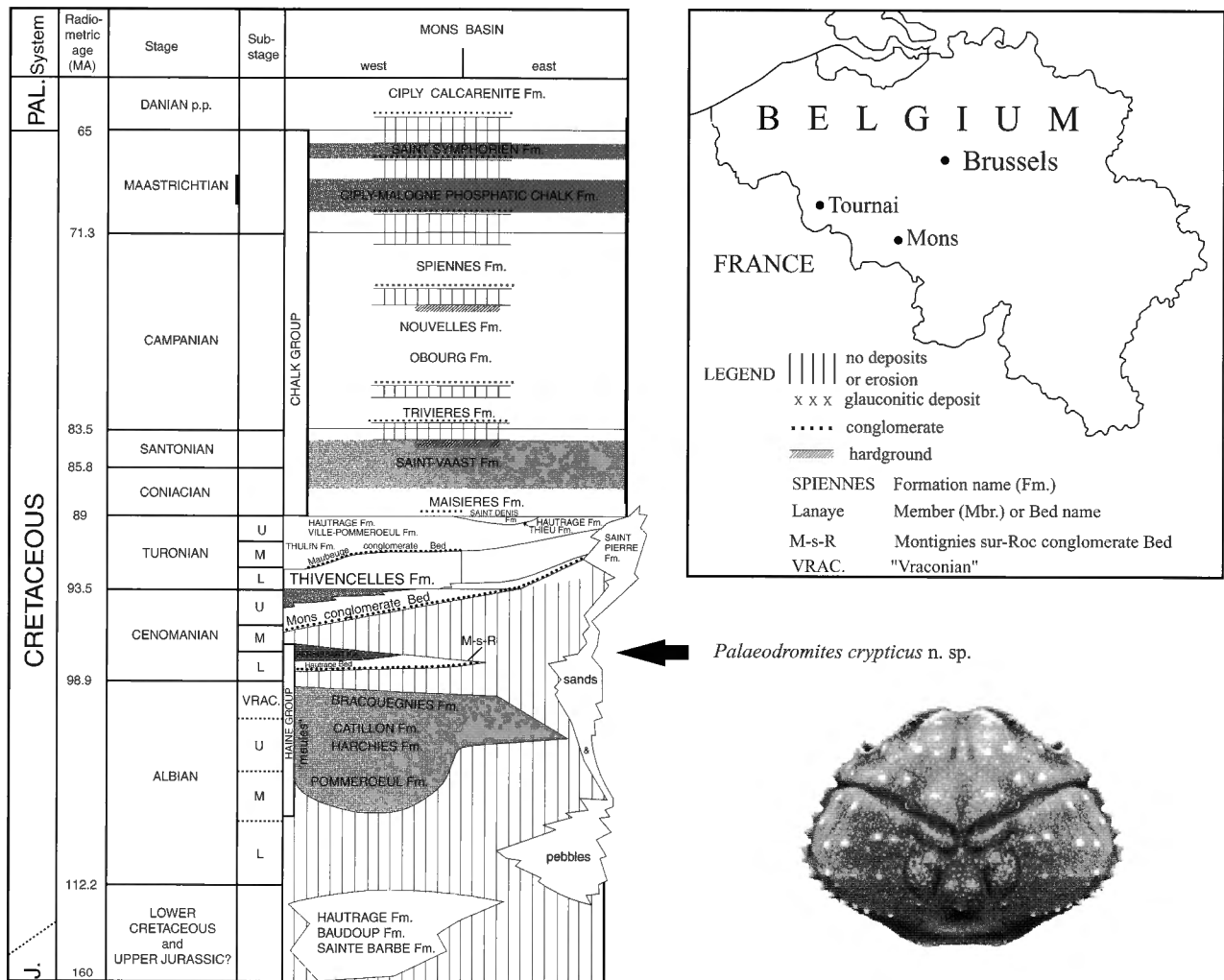


Fig. 1 — Map of Belgium, showing the location of Tournai, just west of the Mons Basin, and local lithostratigraphy (modified after ROBASZYNSKI *et al.*, 2002), with indication of stratigraphic provenience (lower Bernissart Calcirudites Formation) of *Palaeodromites crypticus* n. sp.

by poor outcrop conditions and/or limited collecting effort.

Systematic palaeontology

The following abbreviations are used to denote the repositories of material referred to in the text: IRScNB MI – Institut royal des Sciences naturelles de Belgique, Brussels [Mesozoic Invertebrates]; NHM – The Natural History Museum, Department of Palaeontology, London (formerly British Museum [Natural History]); SDSNH, San Diego Natural History Museum, San Diego, USA; SM, Sedgwick Museum, Cambridge University, Cambridge, UK.

Family Dynomenidae ORTMANN, 1892

Genus *Palaeodromites* A. MILNE-EDWARDS, 1865
(= *Cyphonotus* BELL, 1863 [see WRIGHT & COLLINS, 1972, p. 49]; *Distefania* CHECCHIA-RISPOLI, 1914)

Type species: Palaeodromites octodentatus A. MILNE-EDWARDS, 1865, p. 345, pl. 5, by monotypy.

Palaeodromites crypticus n. sp.

Fig. 2

Type

Holotype, and sole specimen known, is IRScNB MI 11024, from the 'Tourtia de Tournai' facies as

formerly exposed at the Delwart quarry, near Tournai (southwestern Belgium). The associated label reads, 'Cenomanien. Crustacé. Tourtia de Tournai. Carrière Delwart. D. Jacod 1953.' Both external and internal moulds are available; carapace material preserved in the external mould indicates that the internal mould (Fig. 2) probably represents only the innermost layer of test.

Derivation of name

From Latin *crypticus*, meaning hidden, in allusion to the fact that the specimen remained unstudied for several decades, and has only recently come to our attention. In addition, compared to congeners, the new species appears to be rather small.

Diagnosis

Carapace rounded hexagonal in outline, front broad, produced; lateral margins toothed; cervical furrow entire, distinct; carapace surface with transverse rows of tubercles.

Description

Carapace comparatively small, greatest width *c.* 11 mm, length 8.8 mm (as preserved), moderately arched in longitudinal and transverse sections, tallest across mesogastric area, with conspicuous cardiac region (Fig. 2C). Anterolateral margins gently arched and flanged; posterolateral margins evenly rounded to faintly concave.

Carapace widest at 60% from front; posterior margin nearly straight and *c.* 4.5 mm in width (= 41% of carapace width); rostrum incomplete, probably

broadly triangular, steeply downturned (Fig. 2A, C) with a faintly bilobed frontal margin; antennary fossae wide; orbits fairly large, oval and moderately deep.

Width of orbitofrontal margin 7.3 mm (= 66 % of carapace width); anterolateral margins bearing five flattened, irregular teeth (Fig. 2A-C) including small outer orbital one; each longer than wide and bicusped to varying degrees (Fig. 2B); eight small spines present on posterolateral margin.

Mesogastric region and epigastric lobes raised; conspicuous tubercles on mesobranchial lobes (Fig. 2A); cervical furrow near-transverse at lateral margin, then straight and obliquely back from carapace margin to lower edge of mesogastric lobe, curving back behind it in a pointed arc; distinct, broadly triangular mesogastric lobe with elevated posterior portion (Fig. 2A, C). Branchiocardiac furrows barely visible, nearly straight; cardiac region tripartite, elevated (Fig. 2B, C); intestinal lobe raised; forming a rim which runs parallel to posterior margin; urogastric lobe divided by shallow median depression and delimited posteriorly by distinct, narrow, straight transverse furrows.

Dorsal surface covered with fine, more or less regular granules, which are slightly larger and less closely spaced on mesogastric, urogastric and cardiac lobes; transverse rows of well developed, small tubercles are formed on hepatic, mesobranchial and metabranchial regions (Fig. 2A, B).

Discussion

In carapace outline and groove pattern, *P. crypticus* n. sp. is close to *P. incertus*, but there are clear

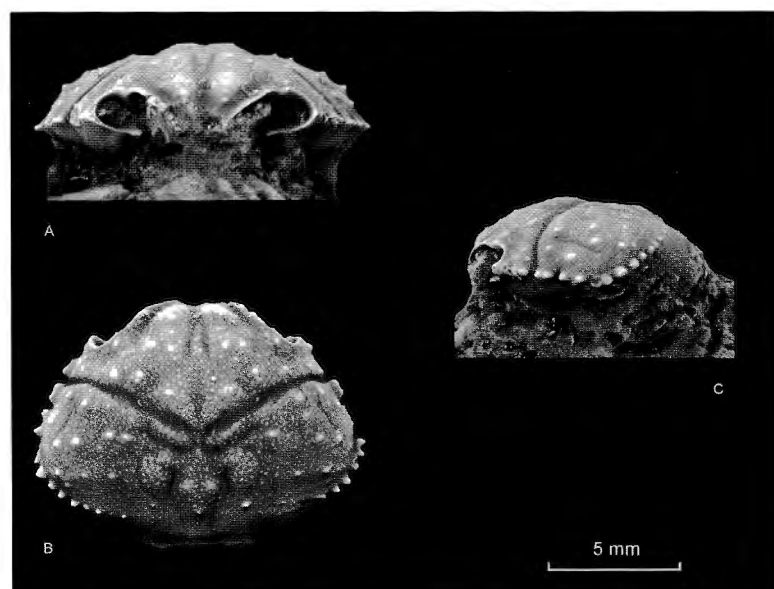


Fig. 2 — *Palaeodromites crypticus* n. sp., holotype (IRScNB MI 11024), from the lower Bernissart Calcirudites Formation ('Tourtia de Tournai') at the former Delwart quarry (Tournai, southwestern Belgium), of early-middle Cenomanian age (*Mantelliceras mantelli* to *Acanthoceras rhotomagense* zones), in frontal (A), dorsal (B) and left lateral (C) views.

differences in carapace ornament, number and outline of anterolateral teeth, as well as orbital length.

Palaeodromites incertus is known from the lowermost Cenomanian (Upper Greensand) of Wiltshire (England), the *Mantelliceras mantelli* Zone at Wilmington (Devon, England), the Cenomanian of the Le Havre area (France; VAN STRAELEN, 1936), as well as from the 'Actinocamax plenus Beds' (uppermost Cenomanian) in the Dresden area (Germany; GLAESSNER, 1932; GRÜNDEL, 1974) and from Cenomanian limestone boulders in conglomerates at Klement (Lower Austria) (GLAESSNER, 1931; WRIGHT, 1997). The lectotype, NHM In.60136 (W. Cunnington Collection; designated by WRIGHT & WRIGHT, 1950, p. 20), is from the Rye Hill Sands (Cenomanian, *M. mantelli* Zone) at Horningsham, Wiltshire (see also WRIGHT & COLLINS, 1972, pl. 9, figs. 1a-c). This specimen shows preservation of innermost layer of test only; therefore, dorsal carapace characters are obscure, meaning that anterolateral teeth, the coarse tuberculations and well-marked areolations of the dorsal surface are not well visible. Other specimens illustrated by WRIGHT & COLLINS (1972, pl. 8, fig. 6) and WRIGHT (1997, figs. 4, 5), however, do reveal this coarse, closely spaced and more or less even tuberculation, the more clearly developed protogastric lobes and the large-cusped anterolateral teeth. *Palaeodromites incertus* lacks the intestinal rim, and its carapace surface bears no transverse rows of tubercles.

Palaeodromites sinuososulcatus WRIGHT & COLLINS, 1972 (p. 49, text-fig. 9a, b; pl. 8, figs. 3, 4; holotype is NHM In.60937) from the Shenley Limestone (lower Albian, *Leymeriella tardefurcata* Zone, *L. regularis* Subzone) of Shenley Hill, Leighton Buzzard (Bedfordshire, England) is the probable ancestor of *P. incertus*. *Palaeodromites incertus* differs from *P. sinuososulcatus* in that the carapace of the former has narrower and larger marginal teeth, a much coarser granulation, a urogastric furrow with a narrow central portion and long, oblique outer parts which extend outside the edges of the mesogastric lobe, and its cervical furrow runs straight from the margin to the edges of the mesogastric lobe. The carapace outline of *P. sinuososulcatus* is more rounded than in *P. crypticus* n. sp.; in addition, no posterolateral teeth or rows of tubercles are observed in the former.

Palaeodromites transiens WRIGHT & COLLINS, 1972 (p. 51, text-figs. 9d, e; pl. 8, figs. 5a, b; holotype is SM B22897) from the Cambridge Greensand (*altonense* to *perinflatum* zones, upper Albian) is

close to *P. sinuososulcatus* but has even less strongly projecting anterolateral teeth and a less distinct areolation. These features distinguish it easily from *P. crypticus* n. sp.

Dorsal ornament and subtle differences in carapace areolation distinguish *Palaeodromites centrosus* VAN STRAELEN, 1940 (p. 4, pl. 1, fig. 6, as *Distefania centrosa*; current whereabouts of holotype unknown), from the Cenomanian of Alsasua (Navarra, northern Spain) from *P. crypticus* n. sp. These forms might well be conspecific.

Palaeodromites himerensis (CHECCHIA-RISPOLI, 1914) (p. 174, as *Distefania*; current whereabouts of holotype unknown), from the Cenomanian of Sicily (Italy) has coarser ornament, larger and squarer marginal teeth, four of which are rather than small tubercles on the posterolateral margin, a bottle-shaped mesogastric lobe and a more transverse cervical furrow. These features easily distinguish it from *P. crypticus* n. sp.

Palaeodromites octodentatus, the type species of the genus, from the Hauterivian (Lower Cretaceous) of Egriselles, near Auxerre (Yonne, France), has a different length/width ratio, while the Hauterivian-Aptian *P. autissiodorensis* (VAN STRAELEN, 1936) (p. 29, pl. 4, fig. 3, as *Cyclothyreus*) of Auxerre (Yonne, France) has a strongly indented outline, less convex posterolateral margins, a wider posterior margin, a more sinuous and transverse cervical furrow and a less strongly tuberculate cardiac lobe than the new species described herein.

Palaeodromites naglei BISHOP, 1983 (p. 44, text-figs 8a, 10; pl. 1, figs 12-17; holotype is SDSNH 23644), from the Albian of Texas, has a much more convex carapace in longitudinal section, a less distinct cervical furrow especially near the carapace margins and a non-tubercular dorsal surface. Recently, COLLINS & DONOVAN (2007) have transferred this species to the closely related genus *Trachynotocarcinus* WRIGHT & COLLINS, 1972, on the basis of two pairs of postcervical furrows. Although having transversely arranged lines of tubercles, no postcervical furrows or depressions are seen in *Palaeodromites crypticus* n. sp., thus excluding it from *Trachynotocarcinus*.

Stratigraphy

As noted by ROBASZYNSKI *et al.* (2002, p. 125, fig. 1), the base of the Bernissart Calcirudites Formation (highest unit of the Haine Green Sandstone Group) comprises coarse, conglomeratic, glauconitic and ferruginous limestones, also referred to as the 'Hautrage Conglomeratic Bed', or 'Tourtia' in

local terminology. Based on ammonoid evidence, this unit is of early to middle Cenomanian age, being equivalent to the *mantelli* and *rhotomagense* zones. As demonstrated by WRIGHT & KENNEDY (1984, 1987, 1990, 2002), *Mantelliceras mantelli* (J. SOWERBY, 1814) ranges through the lower Cenomanian (*M. mantelli* and *M. dixoni* zones) and *Acanthoceras rhotomagense* (BRONGNIART, 1822) is middle Cenomanian (*A. rhotomagense* Zone).

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References

- BELL, A., 1863. A monograph of the fossil malacostracous Crustacea of Great Britain. Part II. Crustacea of the Gault and Greensand. *Monograph of the Palaeontographical Society London*, **1863**: viii +1-40.
- BISHOP, G.A., 1983. Fossil decapod crustaceans from the Lower Cretaceous, Glen Rose Limestone of Central Texas. *Transactions of the San Diego Society of Natural History*, **20**: 27-55.
- BRONGNIART, A., 1822. Sur quelques terrains de Craie hors du Bassin de Paris. In: CUVIER, G. & BRONGNIART, A. Description géologique des environs de Paris. G. Dufour & E. d'Ocagne, Paris, pp. 80-101.
- CHECCHIA-RISPOLI, G., 1914. «*Distefania*», nuovo genere di Brachiuri del Cenomaniano della Sicilia. *Bollettino della Società Zoologica Italiana*, **(3)3(12)**: 173-186.
- COLLINS, J.S.H. & DONOVAN, S.K., 2007. New decapod crustaceans from the Palaeogene of Jamaica. *Bulletin of the Mizunami Fossil Museum*, **33** (2006): 59-65.
- FORIR, H., 1887. Contribution à l'étude du système crétacé de la Belgique. II. Études complémentaires sur les crustacés, III. Bibliographie des Thoracostracés crétacés connus en 1887. *Annales de la Société géologique de Belgique*, **14**: ii +155-195 [37-77].
- GLAESSNER, M.F., 1931. Geologische Studien in der äusseren Klippenzone. *Jahrbuch der geologischen Bundesanstalt Wien*, **81**: 1-23.
- GLAESSNER, M.F., 1932. Neue Krebsreste aus der Kreide, 2. Teil. *Jahrbuch der Preussischen Geologischen Landesanstalt zu Berlin*, **51**(1930): 577-586.
- GRÜNDEL, J., 1974. Die Decapoda (Crustacea) der sächsischen Kreide. *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie*, **21**: 79-100.
- MILNE-EDWARDS, A., 1865. Note sur deux nouveaux crustacés fossiles du terrain néocomien du département de l'Yonne. *Bulletin de la Société des Sciences historiques et naturelles de l'Yonne*, **19**: 341-347.
- ORTMANN, A.E., 1892. Die Dekapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen. *Zoologische Jahrbücher (Systematik)*, **6**: 1-58, 241-326, 532-588.
- ROBASZYNSKI, F., DHONDT, A.V. & JAGT, J.W.M., 2002. Cretaceous lithostratigraphic units (Belgium). In: BULTYNCK, P. & DEJONGHE, J. (Editors), Guide to a revised lithostratigraphic scale of Belgium. *Geologica Belgica*, **4** (2001): 121-134.
- SOWERBY, J., 1812-1822. The mineral conchology of Great Britain; or coloured figures and descriptions of those remains of testaceous animals or shells, which have been preserved at various times and depths in the earth. The author, London, **1**, pls. 1-9 (1812); pls. 10-44 (1813); pls. 45-78 (1814); pls. 79-102 (1815); **2**, pls. 103-114 (1815); pls. 115-150 (1816); pls. 151-186 (1817); pls. 187-203 (1818); **3**, pls. 204-221 (1818); pls. 222-253 (1819); pls. 254-271 (1820); pls. 272-306 (1821); **4**, pls. 307-318 (1821); pls. 319-383 (1822).
- VAN STRAELEN, V., 1936. Crustacés décapodes nouveaux ou peu connus de l'époque crétacique. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, **12(45)**: ii + 1-50.
- VAN STRAELEN, V., 1940. Crustacés décapodes nouveaux du Crétacique de la Navarre. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, **16(4)**: 1-5.
- VAN STRAELEN, V., 1944. Anomoure et brachyures du Cénomanien de la Navarre. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, **20(25)**: 1-12.
- WRIGHT, C.W., 1997. New information on Cretaceous crabs. *Bulletin of the Natural History Museum London (Geology)*, **53**: 135-138.
- WRIGHT, C.W. & COLLINS, J.S.H., 1972. British Cretaceous crabs. *Monograph of the Palaeontographical Society London*, **126(533)**: 1-114.
- WRIGHT, C.W. & KENNEDY, W.J., 1984. The Ammonoidea of the Lower Chalk, Part 1. *Monograph of the Palaeontographical Society London*, **137(567)**: ii + 1-126.

WRIGHT, C.W. & KENNEDY, W.J., 1987. The Ammonoidea of the Lower Chalk, Part 2. *Monograph of the Palaeontographical Society London*, **139**(573): ii + 127-218.

WRIGHT, C.W. & KENNEDY, W.J., 1990. The Ammonoidea of the Lower Chalk, Part 3. *Monograph of the Palaeontographical Society London*, **144**(585): ii + 219-294.

WRIGHT, C.W. & KENNEDY, W.J., 2002. Ammonites. In: SMITH, A.B. & BATTEN, D.J. (Editors), *Fossils of the Chalk*. The Palaeontological Association, London, pp. 176-218.

WRIGHT, C.W. & WRIGHT, E.V., 1950. Some dromiacean crabs from the English Cretaceous. *Proceedings of the Geologists' Association*, **61**: 13-27.

John W.M. JAGT
Natuurhistorisch Museum Maastricht
de Bosquetplein 6-7
NL-6211 KJ Maastricht, The Netherlands
E-mail: john.jagt@maastricht.nl

Barry W.M. VAN BAKEL
René H.B. FRAAIJE
Oertijdmuseum De Groene Poort
Bosscheweg 80
NL-5283 WB Boxtel, The Netherlands
E-mail: barry.van.bakel@wolmail.nl
info@oertijdmuseum.nl

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