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

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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 'Tourtière 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 'Tourtière 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 provenance (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 ‘Tourtière de Tournai’ facies as
A new crab from the Cenomanian of southern Belgium

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; Grundel, 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 Horningham, 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 simuososulcatus* 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. simuososulcatus* 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. simuososulcatus* 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 sinusous and transverse cervical furrow and a less strongly tuberculate cardiac lobe than the new species described herein.

*Palaeodromites nageli* 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 ‘Tourtie’ 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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