

# First record of the homolid crab *Hoplitocarcinus gibbosus* (SCHLÜTER, 1879) from the Lower Campanian of Belgium

by Joe S.H. COLLINS, René H.B. FRAAYE & John W.M. JAGT

## Abstract

The homolid crab *Hoplitocarcinus gibbosus* (SCHLÜTER, 1879) is recorded for the first time from the lower Lower Campanian of Battice (Croix Polinard), province of Liège (northeast Belgium). Two specimens are available, one of them preserving fragmentary chelae and appendages, the other, elements of female sternal structures.

**Key words:** Crustacea, Decapoda, Homolidae, crab, Lower Campanian, Belgium.

## Résumé

Le crabe homolide, *Hoplitocarcinus gibbosus* (SCHLÜTER, 1879), est décrit pour la première fois de la partie basale du Campanien inférieur de Battice (Croix Polinard), province de Liège (Belgique). Deux spécimens sont disponibles, l'un préserve des fragments des pinces et des appendices, l'autre des éléments d'une structure sternale femelle.

**Mots-clés:** Crustacea, Decapoda, Homolidae, crabe, Campanien inférieur, Belgique.

## Introduction

In recent years, our knowledge of Late Cretaceous decapod crustacean faunas from the extended type area of the Maastrichtian Stage has increased considerably, with some forty named taxa recorded to date (JAGT *et al.*, 1991; COLLINS *et al.*, 1995; FRAAYE, 1996a-c; FRAAYE & VAN BAKEL, 1998). Since the material currently available still includes fairly numerous undescribed species (e.g. pagurids), this number is bound to increase even further as research continues. Of note is that homolids in these faunas are rare, with but a single species, *Homolopsis declinata* COLLINS *et al.*, 1995, represented in the Maastricht Formation (Nekum and Meerssen members, late Late Maastrichtian). In underlying strata, of the lower Gulpen and Vaals formations, decapod crustaceans are comparatively rare and generally poorly preserved (see e.g. FELDMANN *et al.*, 1990). From the so-called "smectite facies" (= Herve, Hervien, or Herve greensands of earlier authors) of the Vaals Formation, as exposed at the CPL SA quarry (Haccourt, Liège, see Fig. 1), JAGT & BONGAERTS (1986) recorded the palinurid *Linuparus* (*Po-*

*docratus*) *duelmense* (GEINITZ, 1849) and the nephropid lobsters *Paraclithia nephropiformis* (SCHLÜTER, 1879), and *Oncopareia coesfeldiensis* (SCHLÜTER, 1862). From a number of localities exposing Vaals Formation strata, fragmentary remains of callianassids are now also known, but these have not yet been described.

The two specimens of the homolid *Hoplitocarcinus gibbosus* (SCHLÜTER, 1879) described in the present paper, have recently been recognised in late nineteenth century collections housed at the Institut royal des Sciences naturelles de Belgique (Brussels, IRScNB). The first representatives of that species to be recorded from the Vaals Formation, the present material consists of an almost entire median part of the carapace with the left lateral margin apparently abutting the sidewall and the right sidewall inclined from the margin as a result of a pre-fossil fracture that slightly disoriented the right-hand side of the carapace, with associated limb fragments and the right cheliped (IRScNB IST 10828), and a fragmentary carapace with remains of sternites and abdomen (IRScNB IST 10829).

## Description and discussion

Family Homolidae DE HAAN, 1839  
Genus *Hoplitocarcinus* BEURLEN, 1928

TYPE SPECIES: *Dromiopsis gibbosus* SCHLÜTER, 1879, by subsequent designation of COLLINS (1997).

REMARKS: COLLINS (1997, p. 59) noted that *Metahomola* COLLINS & RASMUSSEN, 1992 (type species, by original designation, *Homolopsis punctata* RATHBUN, 1917) was a junior synonym of *Hoplitocarcinus*.

*Hoplitocarcinus gibbosus* (SCHLÜTER, 1879)  
(Pl. 1)

- \* 1879 *Dromiopsis gibbosus* SCHLÜTER, p. 610, pl. 18, fig. 1.
- \* 1928 *Hoplitocarcinus johannesböhmii* BEURLEN, p. 154, figs. 3, 4.

- 1941 *Homolopsis gibbosa* (Schlüter) – MERTIN, p. 230, pl. 8, figs. 1, 2; text-fig. 25a-g.  
 1993 *Metahomola gibbosa* (Schlüter, 1879) – COLLINS *et al.*, p. 298.  
 1997 *Hoplitocarcinus gibbosus* (Schlüter, 1879) – COLLINS, p. 53.

#### TYPE

Holotype, by monotypy, is the specimen illustrated by SCHLÜTER (1879, pl. 18, fig. 1), housed at the Institut für Paläontologie (SCHLÜTER Collection) of the Rheinische Friedrich-Wilhelms Universität (Bonn).

#### MATERIAL

Two fragmentary capaces, preserving parts of chelae and appendages (IRScNB IST 10828 and 10829), from Battice (Croix Polinard), province of Liège (Belgium; see Fig. 1). One of the labels accompanying these specimens (Rutot Collection, IG 5425) reads:

87. Arthr. Sec. I. Crét.

Et. Campanien Cp2. Hervien.

(Ass. de Herve.)

Loc: Battice (croix Polinard.)

Coll. Rutot. I. G. 5425.

On ammonite evidence (KENNEDY & JAGT, 1995, 1998), the former Battice section is correlatable with the so-called “smectite facies” of the Vaals Formation as exposed in the Haccourt-Lixhe area, west of the River Meuse (Maas). The age assignment of the Vaals Formation sequence there rests primarily on coleoids (CHRISTENSEN & SCHMID, 1987) and ammonites (JAGT, 1989; KENNEDY & JAGT, 1995, 1998). JAGT (1999) noted that these age-diagnostic cephalopods had only been collected from the upper 4-6 metres; the lower part of the unit, which might reach a total thickness of some 20 m according to FELDER (1975), could well be of (Late) Santonian age.

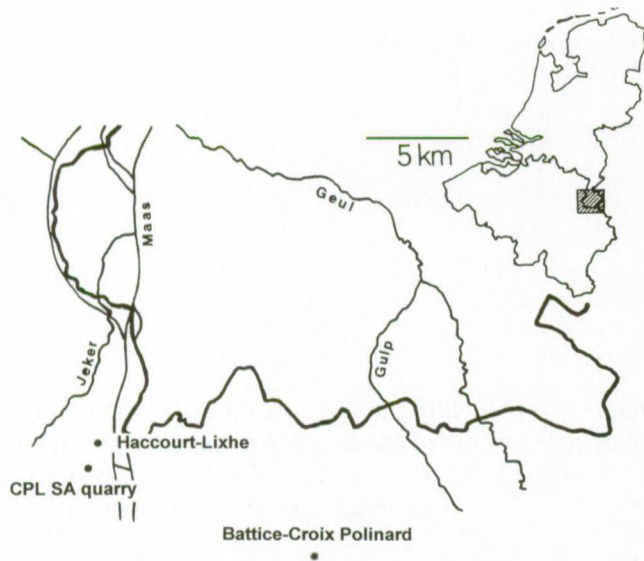


Fig. 1 — Map of the extended type area of the Maastrichtian Stage showing localities mentioned in the text.

#### DESCRIPTION AND DISCUSSION

Notice of *Hoplitocarcinus gibbosus* was first drawn by SCHLÜTER (1879, pp. 610-612, pl. 18, fig. 1, as *Dromiopsis gibbosus*), with the description of a fragmentary carapace from the “untere[n] oder mittlere[n] Mucronaten-Kreide, Zone des *Ammonites Coesfeldiensis* und *Micraster glyphus*” at Darup (Nordrhein-Westfalen, Germany). As figured, the specimen consists of the median portion of a carapace depressed along the *lineae homolicae* between partially preserved sidewalls.

A revised description, aided by additional material from the “tiefes Untersenen Heudeber” and “höheres Untersenen Braunschweig Aktienzegielei” (= ?Late Santonian to Early Campanian, see below) was given by MERTIN (1941, p. 230, pl. 8, figs. 1, 2; text-fig. 25a-g), who at the same time included *Hoplitocarcinus johannesböhm* BEURLEN, 1928 (p. 154, figs. 3, 4, from the “Untersenen” of Braunschweig) as a junior synonym. MERTIN (1941, p. 232) was unable to re-examine the originals of either SCHLÜTER’s or BEURLEN’s material and, as figured by that author (MERTIN, 1941, fig. 25) there is some disparity among the specimens in the distribution of a metabranchial ridge extending from the widest part of the cardiac region - a feature selected, together with a single, triangular rostrum, as a diagnostic character for *Metahomola* COLLINS & RASMUSSEN, 1992 (= *Hoplitocarcinus* BEURLEN, 1928). The presence of a triangular, non-bifid rostrum, a character distinguishing that taxon from *Eohomola* COLLINS & RASMUSSEN, 1992, is both mentioned and illustrated by SCHLÜTER (1879).

Comparison of the new material with MERTIN’s (1941) and, particularly, with SCHLÜTER’s (1879) figures, of the Battice carapaces shows agreement in the presence of metabranchial ridges extending towards the lateral margins. SCHLÜTER’s figure shows paired urogastric tubercles (not included in MERTIN’s version of the same specimen), a median tubercle on the mesogastric lobe and thickening at the base of that lobe, two tubercles on each hepatic region and three on each protogastric lobe. In addition, the present material shows two tubercles on each epibranchial lobe. No tubercles are indicated on MERTIN’s (1941) interpolation of the hepatic region. Only one figure, the original of *Hoplitocarcinus johannesboehmi*, has the paired urogastric tubercles.

As far as we are aware, this species affords the only known member of the genus *Hoplitocarcinus* with associated limbs - albeit still little understood. MERTIN’s illustration (1941, pl. 8, fig. 1) of a carapace from the “höheres Untersenen” of Braunschweig, has elements of both left and right chelipeds in association, while the outer surface of a right cheliped is retained on a second specimen (MERTIN, 1941, pl. 8, fig. 2) from the same locality and stratum. Measurements are quoted as 22.0 mm long by 8.0 mm broad (= high), which, when applied to the figure of a right hand (cutting) chela (MERTIN’s pl. 8, fig. 2) indicate the length of the relatively straight upper margin and the proximal height. The right hand (crushing) chela, exposing the inner surface, preserved with one of the present specimens (Pl. 1, Fig. 4) is



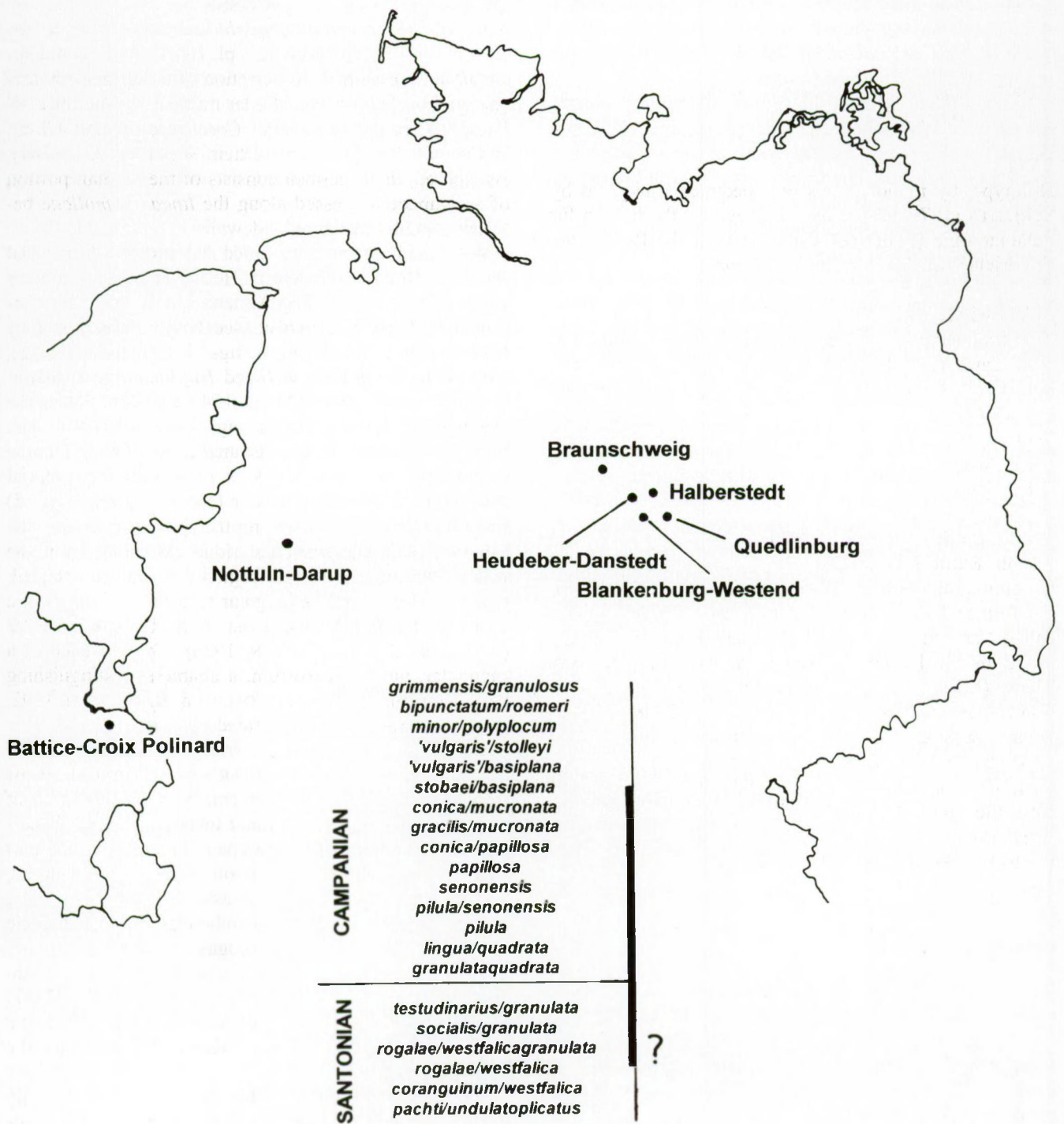


Fig. 2 — Geographic distribution and stratigraphic range of *Hoplitocarcinus gibbosus* (SCHLÜTER, 1879), as based on literature sources and the present record.

marginally smaller than that available to MERTIN. The upper margin of the propodus is strongly curved, the distal height of 22.0 mm reduces proximally to 9.0 mm. The lower margin, weakly convex along the manus, is slightly concave before the fixed finger. A rounded, granulated ridge in line with the fixed finger continues to the carpal margin. A broad median tumidity and a ridge extending parallel to the upper margin have a row of

tubercles proximally and there are tubercles on the upper margin. Four rows of granules line the outer surface of the minor chela (MERTIN, 1941, pl. 8, fig. 2). As reported by MERTIN (1941), preceding segments are proportionately massive, the carpus is triangular; the merus is longer than the propodus and tapers proximally to half its distal height.

The robustness of these chelae is in marked contrast to

the slender, almost delicate, dissociated chelae attributed to homolids by comparison with Recent *Homola* spp., found in the Cenomanian of Devon (United Kingdom), and the Middle Danian of Denmark.

Broadly ovate 5th and 6th female abdominal somites and telson are partially preserved with specimen IRScNB IST 10829 (Pl. 1, Fig. 5). The width of the 5th somite is about three times the length; the 6th is a little longer, its length being about half the basal width. The length of the subtriangular telson equals that of the 5th somite, shallow concavities flank the raised median part. Abdomina are not commonly preserved among fossil homolids; the present remains compare favourably with those parts preserved with *Homolopsis brightoni* WRIGHT & COLLINS, 1972 (pl. 6, fig. 2) from the Gault (Albian) of Folkestone (United Kingdom).

COLLINS *et al.* (1993, p. 300) remarked upon the similarity of *Metahomola* (= *Hoplitocarcinus*) *brevis* COLLINS *et al.*, 1993 (p. 297, fig. 2/2-3) from the Turonian-Santonian of Hokkaido (Japan), to the Middle Eocene *Prohomola japonica* (YOKOYAMA, 1911) (see KARASAWA, 1992, p. 1250, figs. 3/5-7), and the suggestion was made that *M. brevis* could be an early ancestral form of *Prohomola*. On the other hand, GUINOT & RICHER DE FORGES (1995) drew attention to the similarities of carapace characters between *Metahomola* (= *Hoplitocarcinus*) and those of Recent *Lamoha* NG, 1998. The size and ornament of the chelipeds of *Lamoha noar* (WILLIAMS, 1974), are remarkably close to those of *Hoplitocarcinus gibbosus*.

#### OCCURRENCE

SCHLÜTER'S (1879) type of *Dromiopsis gibbosus* came from the "untere[n] oder mittlere[n] Mucronaten-Kreide, Zone des *Ammonites Coesfeldiensis* und *Micraster glyphus*", near Nottuln-Darup (Nordrhein-Westfalen). KAP-

LAN *et al.* (1996, p. 13) noted that the exact location of SCHLÜTER'S sites that exposed "Mucronaten Mergel von Darup" or "Mucronaten Kreide von Darup" could no longer be determined. However, on ammonite evidence, and on *Hoplitoplacenticeras (H.) coesfeldiense* (SCHLÜTER, 1867) in particular, this would mean an early Late Campanian age (= lower part of so-called Vorhelmer Schichten, roughly equivalent to *hasiplana/spiniger* Zone *sensu germanico*).

Material recorded by MERTIN (1941) and assigned to *H. gibbosus*, came from the "tiefes Untersenen" at Heudeber (near Halberstadt) and from the "höheres Untersenen" of the Braunschweig area. On p. 156, MERTIN (1941) referred to the clay pit near the railway station of Heudeber-Danstedt as "tiefstes Untersenen", but unfortunately did not list any age-diagnostic macrofossils from that locality. However, a Middle to Late Santonian age may be assumed. On the same page, MERTIN'S "höheres Untersenen" is also referred to as "Obere Granulatenschichten", which in current terminology would correspond to the early Early Campanian (*granulataquadrata* and *?lingua/quadrata* zones *sensu germanico*; see KRÜGER, 1983; KENNEDY & KAPLAN, 1995; MUTTERLOSE *et al.*, 1998).

#### Acknowledgements

We wish to thank Annie V. DHONDT and W. MISEUR (both Institut royal des Sciences naturelles de Belgique, Brussels) for arranging the loan of material and preparation of photographs, respectively, and S.K. DONOVAN (Natural History Museum, London), D.H. TSHUDY (Department of Geosciences, Edinboro University of Pennsylvania, Edinboro) and H. KARASAWA (Mizunami Fossil Museum, Mizunami) for constructive comments on an earlier typescript.

#### References

- BEURLIN, K., 1928. Die fossilen Dromiaceen und ihre Stammesgeschichte. *Paläontologische Zeitschrift*, **10**: 144-183.
- CHRISTENSEN, W.K. & SCHMID, F., 1987. The Belemnites of the Vaals Formation from the C.P.L. Quarry at Hallembaye in Belgium - Taxonomy, Biometry and Biostratigraphy. *Geologisches Jahrbuch*, **A 94**: 3-37.
- COLLINS, J.S.H., 1997. Fossil Homolidae (Crustacea; Decapoda). *Bulletin of the Mizunami Fossil Museum*, **24**: 51-71.
- COLLINS, J.S.H., FRAAYE, R.H.B. & JAGT, J.W.M., 1995. Late Cretaceous anomurans and brachyurans from the Maastrichtian type area. *Acta palaeontologica polonica*, **40**: 165-210.
- COLLINS, J.S.H., KANIE, Y. & KARASAWA, H., 1993. Late Cretaceous crabs from Japan. *Transactions and Proceedings of the Palaeontological Society of Japan*, n.s., **172**: 292-310.
- COLLINS, J.S.H. & RASMUSSEN, H.W., 1992. Upper Cretaceous-Lower Tertiary decapod crustaceans from West Greenland. *Bulletin of the Grønlands geologiske Undersøgelse*, **162**: 1-46.
- FELDER, W.M., 1975. Lithostratigraphische Gliederung der Oberen Kreide in Süd-Limburg (Niederlande) und den Nachbargebieten. Erster Teil: Der Raum westlich der Maas, Typusgebiet des "Maastricht". *Publicaties van het Natuurhistorisch Genootschap in Limburg*, **24**: 1-43.
- FELDMANN, R.M., JAGT, J.W.M. & TSHUDY, D.M., 1990. Late Maastrichtian isopod and decapod Crustacea from Haccourt (Liège), northeastern Belgium. *Mededelingen van de Rijks Geologische Dienst*, **44**: 23-35.
- FRAAYE, R.H.B., 1996a. A new Tethyan migrant: *Cretachlorodius enciensis* n. gen., n. sp. (Crustacea, Decapoda), from the Maastrichtian type area. *Journal of Paleontology*, **70**: 293-296.
- FRAAYE, R.H.B., 1996b. Two new crabs, *Graptocarcinus maas-trichtensis*, and *Caloxanthus kuypersi* (Crustacea, Decapoda), from the type Maastrichtian of The Netherlands. *Journal of Paleontology*, **70**: 463-465.
- FRAAYE, R.H.B., 1996c. Evolution of Meso- and Cenozoic decapod crustaceans and their role in former ecosystems. Universiteit Utrecht, Utrecht, x + 194 pp. (unpubl. PhD thesis).
- FRAAYE, R.H.B. & VAN BAKEL, B.W.M., 1998. New raninid crabs (Crustacea, Decapoda, Brachyura) from the late Maas-



- trichtian of the Netherlands. *Geologie en Mijnbouw*, **76**: 293-299.
- GEINITZ, H.B., 1849-1850. Das Quadersandsteingebirge, oder Kreidegebirge in Deutschland. Craz und Gerlach, Freiberg, 1-96 (1849), 97-293 (1850).
- GUINOT, D. & RICHER DE FORGES, B., 1995. Crustacea Decapoda: La famille des Homolidae de Haan, 1839. In: CROSNIER, A. (ed.). Résultats des Campagnes MUSORSTOM, 13. *Mémoires du Muséum d'Histoire naturelle de Paris* (Zoologie), **163**: 283-517.
- HAAN, W. DE, 1833-1849. Crustacea. In: SIEBOLD, P.F. von (ed.). Fauna Japonica, sive descriptio animalium, quae in itinere per Japoniam, jussu et auspiciis superiorum, qui summum in India Batava Imperium tenent, suscepto, annis 1823-1830 collegit, notis, observationibus et adumbrationibus illustravit. A. Arnz, Leiden, 1-24 (1833), 25-64 (1835), 65-72 (1837), 73-108 (1839), 109-164 (1841), 165-243 (1849).
- JAGT, J.W.M., 1989. Ammonites from the early Campanian Vaals Formation at the CPL quarry (Haccourt, Liège, Belgium) and their stratigraphic implications. *Mededelingen van de Rijks Geologische Dienst*, **43**: 1-33.
- JAGT, J.W.M., 1999. Late Cretaceous-Early Palaeogene echinoderms and the K/T boundary in the southeast Netherlands and northeast Belgium - Part 1: Introduction and stratigraphy. *Scripta Geologica*, **116**: 1-57.
- JAGT, J.W.M. & BONGAERTS, H.L., 1986. Kreeftresten uit de Formatie van Vaals (Onder-Campanien, Boven-Krijt) in de groeve Ciments Portland Liégeois, Haccourt, Liège (B.). *Natuurhistorisch Maandblad*, **75**: 76-80.
- JAGT, J.W.M., COLLINS, J.S.H. & FRAAYE, R.H.B., 1991. A new late Maastrichtian xanthid crab from southern Limburg (The Netherlands). *Cretaceous Research*, **12**: 553-560.
- KAPLAN, U., KENNEDY, W.J. & ERNST, G., 1996. Stratigraphie und Ammonitenfaunen des Campan im südöstlichen Münsterland. *Geologie und Paläontologie in Westfalen*, **43**: 1-133.
- KARASAWA, H., 1992. Fossil decapod crustaceans from the Manda Group (Middle Eocene), Kyushu, Japan. *Transactions and Proceedings of the Palaeontological Society of Japan*, n.s., **167**: 1247-1258.
- KENNEDY, W.J. & JAGT, J.W.M., 1995. Lower Campanian heteromorph ammonites from the Vaals Formation around Aachen, Germany, and adjacent parts of Belgium and The Netherlands. *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, **197**: 275-294.
- KENNEDY, W.J. & JAGT, J.W.M., 1998. Additional Late Cretaceous ammonite records from the Maastrichtian type area. *Bulletin de l'Institut royal des Sciences naturelles de Belgique, Sciences de la Terre*, **68**: 155-174.
- KENNEDY, W.J. & KAPLAN, U., 1995. *Parapuzosia* (*Parapuzosia*) *seppenradensis* (Landois) und die Ammonitenfauna der Dülmener Schichten, unteres Unter-Campan, Westfalen. *Geologie und Paläontologie in Westfalen*, **33**: 1-127.
- KRÜGER, F.J., 1983. Geologie und Paläontologie: Niedersachsen zwischen Harz und Heide. Exkursionen ins Mesozoikum Nordwestdeutschlands. Frank'sche Verlagshandlung, Stuttgart, 244 pp.
- MERTIN, H., 1941. Decapode Krebse aus dem subhercynen und Braunschweiger Emscher und Untersenon, sowie Bemerkungen über einige verwandte Formen in der Oberkreide. *Nova Acta Leopoldina*, n.s., **10**: 149-254.
- MUTTERLOSE, J., BORNEMANN, A., RAUER, S., SPAETH, C. & WOOD, C.J. (eds), 1998. Key localities of the northwest European Cretaceous. *Bochumer geologische und geotechnische Arbeiten*, **48**: 1-231.
- NG, P.K.L., 1998. *Lamoha*, a replacement name for *Hypsophrys* Wood-Mason & Alcock, 1891 (Brachyura: Homolidae), a junior synonym of *Hypsophrys* Agassiz, 1859 (Teleostei: Cichlidae). *Crustaceana*, **71**: 121-125.
- RATHBUN, M.J., 1917. New species of South Dakota Cretaceous crabs. *Proceedings of the United States national Museum*, **52**: 385-391.
- SCHLÜTER, C., 1862. Die Macruren Decapoden der Senon- und Cenoman-Bildungen Westfalens. *Zeitschrift der deutschen geologischen Gesellschaft*, **14**: 702-749.
- SCHLÜTER, C., 1867. Beitrag zur Kenntniss der jüngsten Ammoneen Norddeutschlands. I. Ammoniten der Senon-Bildungen. A. Henry, Bonn, 36 pp.
- SCHLÜTER, C., 1879. Neue und weniger gekannte Kreide- und Tertiär-Krebse des nördlichen Deutschlands. *Zeitschrift der deutschen geologischen Gesellschaft*, **31**: 586-615.
- WILLIAMS, A.B., 1974. A new species of *Hypsophrys* (Decapoda: Homolidae) from the Straits of Florida, with notes on related crabs. *Proceedings of the Biological Society of Washington*, **87**: 485-492.
- WRIGHT, C.W. & COLLINS, J.S.H., 1972. British Cretaceous crabs. *Monograph of the Palaeontographical Society London*, **126**(533): 1-114.
- YOKOYAMA, M., 1911. Some Tertiary fossils from the Miike Coalfield. *Journal of the College of Science, Imperial University of Tokyo*, **27**: 1-16.

Joe S.H. COLLINS  
 Department of Palaeontology  
 The Natural History Museum  
 Cromwell Road  
 London SW7 5BD, United Kingdom  
 and  
 8 Shaw's Cottages  
 Perry Rise, Forest Hill  
 London SE23 2QN, United Kingdom

René H.B. FRAAYE  
 Oertijdmuseum de Groene Poort  
 Bosscheweg 80  
 NL-5283 WB Boxtel, The Netherlands

John W.M. JAGT  
 Natuurhistorisch Museum Maastricht  
 P.O. Box 882  
 NL-6200 AW Maastricht, The Netherlands  
 E-mail: mail@nhmmaastricht.nl

Typescript submitted 13 September 1999.  
 Revised typescript received 24 May 2000.

## PLATE I

*Hoplitocarcinus gibbosus* (SCHLÜTER, 1879)  
Lower Campanian (Vaals Formation, "smectite facies") of  
Battice/Croix-Polinard (Liège, Belgium)

Figs. 1-4 — IRScNB IST 10828 (*ex* Rutot Colln, IG 5425); internal and external moulds of carapace and associated chela.  
Figs. 5, 6 — IRScNB IST 10829 (*ex* Rutot Colln, IG 5425); female sternal structure, and anterior portion of carapace.

Scale bars equal 10 mm.

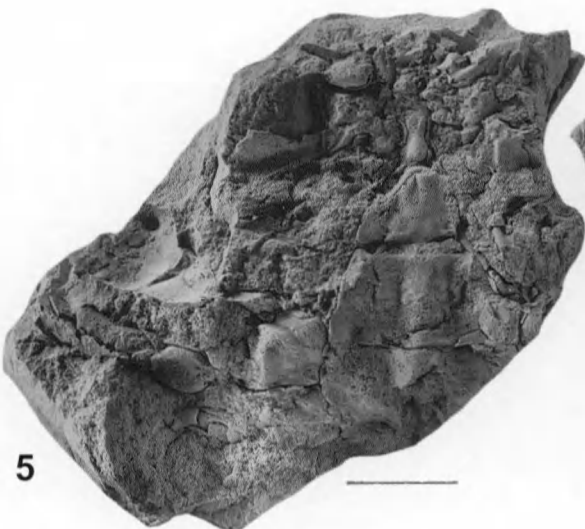
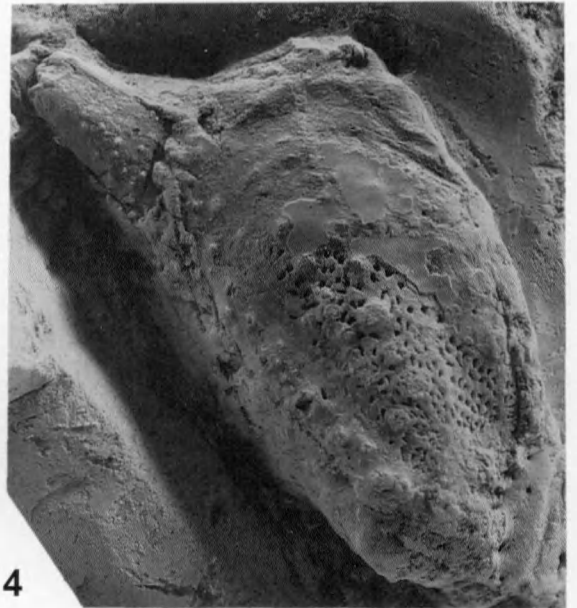
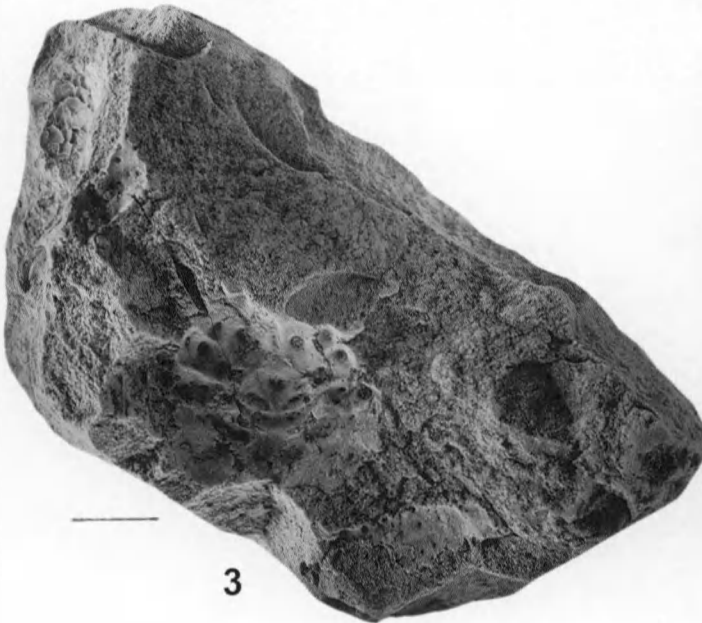


PLATE I

