Bull. Mizunami Fossil Mus., no. 22 (1995), p. 67-72, 2 figs.

New decapod Crustaceans from the Cenomanian Rudist Limestones of NE Italy

Joe S. H. Collins* and Iginio Dieni**

*8, Shaw's Cottages, Perry Rise, Forest Hill, London, SE23 2QN, Great Britain
**Dipartimento di Geologia, Paleontologia e Geofisica dell'Università, Via Giotto, 1, I -35137 Padova, Italy

Abstract

A new dynomenid crab, *Graptocarcinus bellonii*, and a chela, tentatively assigned to the Paguridae, are described from the Cenomanian rudist limestones of northeast Italy; the geographical distribution of both taxa is thereby extended into southern Europe.

Key words: Crustacea, Decapoda, Cenomanian, Italy.

Introduction

The discovery of the genus *Graptocarcinus* in the Cenomanian of Italy considerably extends the geographical range of the genus erected by Roemer (1887) to contain *Graptocarcinus texanus* Roemer, 1887 from the Lower Cenomanian Buda Limestone of Texas. Stenzel (1944) described *Graptocarcinus muiri* from the presumed Albian of Mexico, but this species was later synonymised with *G. texanus* by Wright & Collins (1972), who in the same work also included *Necrocarcinus avicularis* Fritsch, 1857 (Cenomanian, Czechoslovakia) and *Cyphonotus integrimarginatus* Wright & Wright, 1950 (Cenomanian, England) in the synonymy of *G. texanus*. That species was later recorded from the Maastrichtian of France by Remy (1955) and a new Maastrichtian species from Limburg is presently under description (R. H. B. Fraaye, *pers comm.*).

Pagurids in the Cretaceous of Europe are not common and the ornament of the present, tentatively assigned chela, renders it distinct from any described form. Some half dozen North American species may likewise be distinguished.

The studied material is housed in the museum of the Dipartimento di Geologia, Paleontologia e Geofisica dell'Università di Padova.

Stratigraphy

The decapod material described herein was collected from Col dei Schiosi, Pordenone, western Carnic Prealps, NE Italy, in a carbonate sequence connected with the northwestern margin of the Friuli Platform and outcropping in the eastern part of the Altopiano del Cansiglio (Fig. 1). The fossiliferous beds of Col dei Schiosi have been well known since the last century and have been frequently studied (e. g. Taramelli, 1873, 1877, 1881; Pirona, 1877, 1884, 1886, 1887; Boehm, 1885, 1887, 1892, 1895; Futterer, 1892; Parona, 1908a, 1908b; Dainelli, 1911).

The famous fossiliferous locality is situated near "Casère S-ciòs" about 1350 m a. s. l., within the area designated with the "Col dei Scios" toponym in the recent official topographical map (I. G. M. sheet 23, II

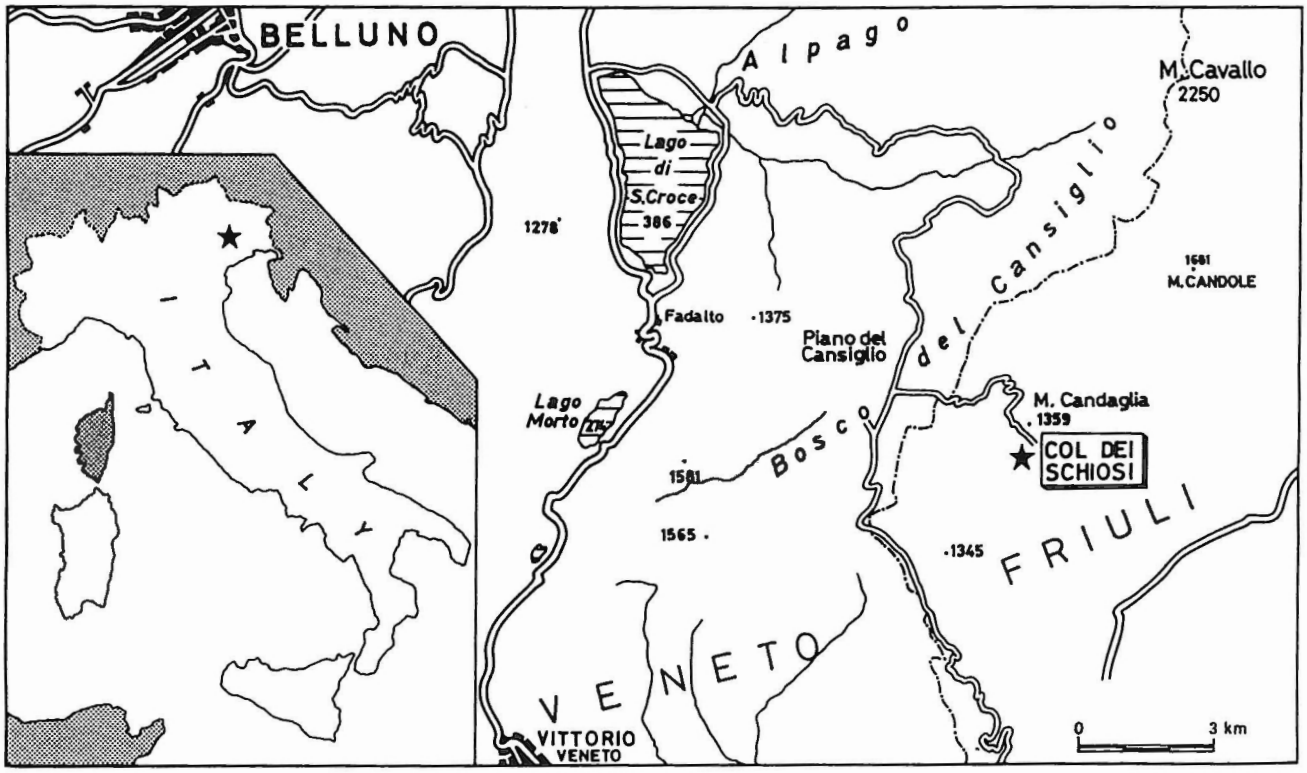


Fig. 1. Outline map of NE Italy showing location of Col dei Schiosi.

S. E., Bosco del Cansiglio). Although the correct spelling of the site is "Col dei S-ciòs" (meaning "Hill of the snails" in the local dialect, because of the great abundance of fossils) it is preferred to use the Italianized name "Col dei Schiosi", as found in the palaeontological literature since the last century.

The Col dei Schiosi fauna is especially important for its nerineid content. Many fossils belonging to other groups considered in literature as typical for Col dei Schiosi, including the well known caprinid fauna (Parona, 1908a), come from other outcrops in the vicinity (Dal Piaz, 1911).

The Col dei Schiosi Limestone is the lithostratigraphic unit including all these fossiliferous horizons. From a palaeontological point of view the formation is essentially characterised by corals, rudists and other bivalves, gastropods and foraminifers, most of them indicative of an open platform environment.

The Col dei Schiosi Limestone consists mainly of biointraclastic limestones, rudstones and grainstones, and was deposited in a high energy environment. Indeed many fossils show evidence of mechanical processes, including breakage, abrasion and shell orientation, and the limestones consist almost entirely of rudist fragments, mainly from radiolitids. From a sedimentary point of view many horizons are characterised by depositional patterns suggesting hydraulic regimes typical for storms or hurricane episodes.

The rudist and nerineid faunas from the Col dei Schiosi Limestone, previously often referred to the Turonian, have been thought recently to be indicative of late Cenomanian age. They allow correlation with similar assemblages from central Italy (e. g. Carbone *et al.*, 1972) and Croatia (Polšak, 1967).

Among the non-rudistid bivalves *Chondrodonta joannae* (Choffat, 1886) can be considered as a good marker of the Col del Schiosi association because elsewhere this species has been dated by macroforaminifers and rudists as being of late (but not latest) Cenomanian age, *Neithea fleuriausiana* (d'Orbigny, 1847) and *Neithea inconstans* (Sharpe, 1850), which very often accompany *Chondrodonta joannae* in the rudist facies, are also probably indicative of the same restricted age (Dhondt & Dieni, 1993).

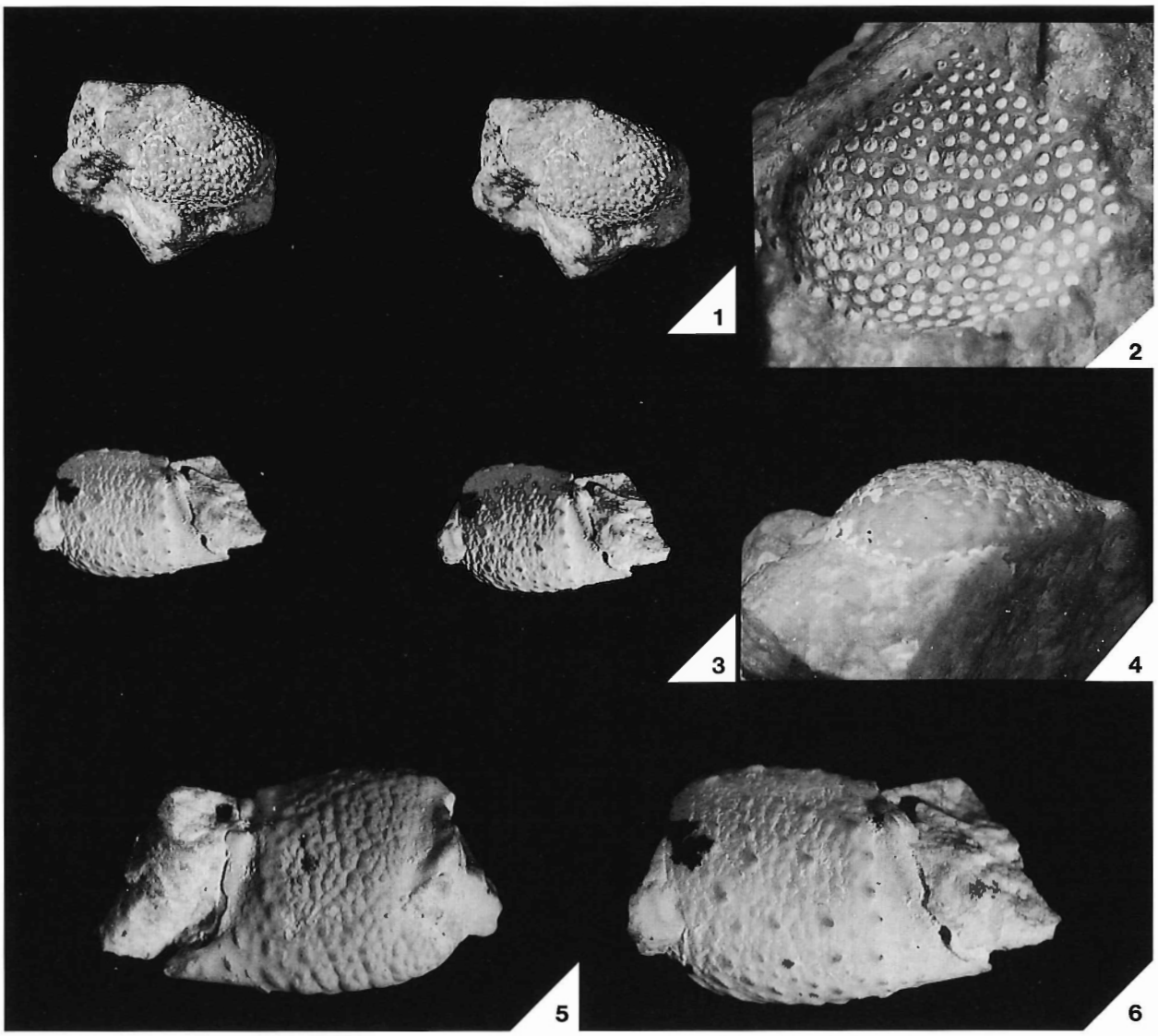


Fig. 2. 1, 2, 4, *Graptocarcinus bellonii* sp. nov. 1, Stereoscopic view of the internal mould, × 1.9. 2, Internal mould, × 4,6. 4, Right lateral view of external mould, × 4.5. 3, 5, 6, Paguridae gen. indet. 3, Stereoscopic view of outer surface of right chela, × 2.7. 5, Inner surface, × 5. 6, Outer surface, × 5.

Systematic Descriptions

Infraorder Anomura H. Milne Edwards, 1832
Superfamily Paguroidea Latreille, 1802
Family Paguridae Latreille, 1802
Subfamily Pagurinae Latreille, 1802

Genus indet.
(Figs. 2-3, 5, 6)

Material: A right chela, No. DGP. 242.

Description: Chela subquadrate, about one third longer than high, highest proximally and slightly incurved. The upper margin is rather more convex than the lower and the proximal angles are well rounded into a nearly straight carpal margin. The fixed finger is short, being only about one fifth the length of the lower margin, the opposing margin is convex and smooth, but there are fine granules leading into the reclined interdigital margin. The transverse section is elongate ovate with a depression along the lower margin. The base-ornament of the outer surface consists of vertically arranged scales, steeper on the

distal side, on which there are five longitudinal rows of three or four sharp tubercles more or less regularly spaced as far as the height of the fixed finger, where the tubercles become more numerous and irregularly spaced; additional tubercles intersperse the distal row before a smooth depression bounding the interdigital margin. A similar depression bounds that margin on the inner surface and the fixed finger is almost smooth, otherwise the ornament of the manus is coarser, less regularly arranged than on the outer surface, with the scales smaller, more crowded in the upper half.

Remarks: Without knowledge of the opposite chela, it is not considered prudent to place the specimen in either *Pagurus* Fabricius, 1775 or *Paguristes* Dana, 1851, one of which is the most probable genus to contain it among Cretaceous pagurids.

The tubercular ornament is remarkably similar in distribution to that of the Middle Jurassic species *Pagurus bathonicus* Remy, 1955, from Calvados, N. W. France. The manus of *P. bathonicus*, which is right-handed, however, is more quadrate in outline, the tubercles rather more numerous and the fixed finger is stouter.

Infraorder Brachyura Latreille, 1803
Section Podotremata Guinot, 1977
Subsection Dromiacea Ortmann, 1892
Family Dynomenidae Ortmann, 1892

Genus *Graptocarcinus* Roemer, 1887

Type species: By monotypy *Graptocarcinus texanus* Roemer, 1887.

Range: Upper Albian to Maastrichtian.

Graptocarcinus bellonii sp. nov.
(Figs. 2-1, 2, 4)

Derivation of name: In honour of Antonio Belloni, who collected and generously presented the material described herein.

Diagnosis: Carapace rounded-hexagonal, cervical furrow entire; lateral margins and dorsal surface coarsely tuberculate.

Material: Holotype, an internal mould and its counterpart of a carapace lacking details of the front. No. DGP. B241.

Description: Carapace rounded-hexagonal in outline, length about four fifths the width, widest slightly posterior to midlength, flatly arched in transverse section, rather more boldly so longitudinally, being more steeply curved posteriorly. Anterolateral margins partially obscured, probably gently convex; the lateral angle is broadly rounded. Large rounded, slightly upturned granules line the exposed part of the anterolateral margin and, although not regular, they do not diminish noticeably in size until the middle of the almost straight posterolateral margin and terminate at the posterior angle; the posterior margin is narrow and weakly concave. The marginal tubercles are distinctly separated from one another and, at the lateral angles, by a 'furrow' from large even sized rounded tubercles crowding the dorsal surface; the tubercles are concentrically arranged more or less conforming to the carapace outline and small granules infil the posterolateral margin extension of the 'furrow'. The cervical furrow crosses the midline anterior to midlength; on both internal cast and shell surface it forms a deep broadly rounded V across the midline, then weakening, it runs in an uninterrupted curve to the groove bounding the lateral margins. A feebler furrow delimiting the urogastric lobe is straight across the midline before following the course of the cervical furrow a short distance. The lateral angles of the mesogastric lobe are defined on the internal cast, but on the shell surface this lobe and the cardiac region are defined more by the arrangement of the tubercles than grooves.

Discussion: Stenzel (1944) distinguished *Graptocarcinus muiri* Stenzel, 1944 from *G. texanus* on what he considered to be, "minor, but evidently specific details". These were differences in size and carapace proportions and, what Stenzel considered more critical, the simple, smooth raised margin bounded by a furrow of *G. muiri*, compared with the raised granulated margin and tubercle-obscured marginal furrow of *G. texanus*. Wright & Collins (1972) showed that the length/width percentage of *G. muiri* conformed with that of *G. texanus* and opined that the difference in size was of no significance when there

was no evidence supporting final moult stage [in relation to size] ; Wright & Collins, also considered that trivial differences in the margin hardly justified separation and placed *G. muiri* in the synonymy of *G. texanus*.

Subsequently acquired carapaces of *G. texanus* (JSHC Coll. & R. H. B. Fraaye Coll.), together with the original material, present a range of growth sizes and degrees of preservation which not only combine the arguments of the several authors involved, but substantiate the synonymy.

The syntype of *G. texanus* figured by Rathbun (1935, pl. 10, fig. 14) clearly depicts the cervical furrow extending to the lateral margin; the furrow curves upwards and outward from the V-shaped median portion—normally the persisting part of the furrow—to near the lateral margin, where it narrows and recurves to cross the margin, thereby differing from that of *G. bellonii* in which the furrow progresses in a continuous curve to the margin. A longer urogastric furrow, together with large, dense, more or less even-sized granules on the margin and dorsal surface further distinguish *G. bellonii* from *G. texanus*.

Wright & Collins (1972) were of the opinion that *Graptocarcinus* was derived from a *Palaeodromites* resembling the late Albian *Palaeodromites transiens* Wright & Collins, 1972 by loss of the lateral spines, obsolescence of the furrows and lobes of the upper surface and narrowing of the frontal border. The well-developed furrows of *G. bellonii* are clearly retained characters of that ancestral stock which extends to the Turonian, or possibly Maastrichtian (Collins, Fraaye & Jagt, 1995).

That species may possibly represent an early, well preserved moult-stage of *G. texanus*, however, cannot be ignored.

Acknowledgements

We are grateful to R. Gatto, Padova, Italy and C. W. Wright, Dorset, England for their helpful critisims and advice, to C. Brogiato for the photographic work and to F. Todesco for the draughtmanship. This work is supported by the Italian M. U. R, S. T. (grant to I. Dieni).

References

Boehm, G. (1885), Über südalpine Kreideablagerungen. *Z. deutsch. geol. Ges.*, **37**, 544-549.

Boehm, G. (1887), Das Alter der Kalke des Col dei Schiosi. *Z. deutsch. geol Ges.*, **39**, 203-204.

Boehm, G. (1892), Ein Beitrag zur Kenntniss der Kreide in den Venetianer Alpen. *Ber. naturforsch. Ges. Freiburg*, **6**, 134-149, 3 figs., 4 pls.

Boehm, G. (1895), Beiträge zur Kenntniss der Kreide in den Südalpen, I. Die Schiosi-und Calloneghe-Fauna. *Palaeontographica*, **41**, 81-148, 26 figs., 8 pls.

Carbone, F., Praturlon, A. and Sirna, G. (1972), The Cenomanian shelf-edge facies of Rocca di Cave (Prenestini Mts., Latium). *Geologica rom.*, **10**, 131-198, 53 figs.

Collins, J. S. H., Fraaye, R. H. B. and Jagt, J. W. M. (1995), Late Cretaceous anomurans and brachyurans from the Maastrichtian type area. *Acta palaeont., polon.*, **40**(2), 165-210, 12 figs.

Dainelli, G. (1911), Introduzione allo studi del Cretaceo friulano. *Atti. Soc. tosc. Sci. nat. Mem.*, **26**, 160-209; **27**, 17-54.

Dal Piaz, G. (1911), Altipiano del Cansiglio e regione circostante. *Boll. r. Com. Geol. Ital.*, **41**, 423-440, 3 figs.

Dhondt, A. V. and Dieni, I. (1993), Non-rudistid bivalves from Late Cretaceous rudist limestones of NE Italy (Col dei Schiosi and Lago di S. Croce areas.). *Mem. Sci. geol.*, **45**, 165-241, 18 figs., 20 pls.

Futterer, K. (1892), Die oberen Kreidebildungen der Umgebung des Lago di Santa Croce in den Venetianer Alpen. *Palaeont. Abh.*, n. s., **2**(1), 1-124, 25 figs., 12 pls.

Parona, C. F. (1908a), Saggio per uno studio sulle Caprinidi dei calcari di scogliera (orizzonte del Col dei Schiosi) nella Prealpi Venete orientali. *Mem. r. Acc. Lincei. Cl. Sci. fis. mat. nat.*, s. 5, **7**, 319-346, 30 figs.

Parona, C. F. (1908b), Sopra alcune rudiste del Cretaceo superiore del Cansiglio. *Mem. r. Acc. Sci. Torino.* s. 2, **59**, 139-156, 12 figs., 1 pl.

Pirona, G. A. (1877), La provincia di Udine sotto L'aspetto storico naturale. *Cron. r. Liceo Stellini*, 1875-1876, 1-62.

Pirona, G. A. (1884), Nuovi fossili del terreno cretaceo del Friuli. *Mem. r. Ist. ven. Sci. Lett. Arti.*, **22**, 159-168, 3 pls.

Pirona, G. A. (1886), Due Chamacee nuove del terreno cretaceo del Friuli. *Mem. r. Ist. ven. Sci. Lett. Arti*, **22**,

639-700, 2 pls.

Pirona, G. A. (1887), Nuova contribuzione alla fauna fossile del terreno cretaceo del Friuli. *Atti. r. Ist. ven. Sci. Lett. Arti*, s. 6, **5**, 1-6, 1 pl.

Polšak, A. (1967), Macrofaune crétacé de l'Istrie méridionale (Yougoslavie). *Palaeont. jugoslav.*, **8**, 1-219, 45 figs., 85 pls. (In Croatian with French summary.)

Rathbun, M. J. (1935), Fossil Crustacea of the Atlantic and Gulf coastal plain. *Spec. Pap. Geol. Soc. Am.*, **2**, vii+1-160, 26 pls., 2 figs.

Remy, J. M. (1955), *Pagurus bathonicus* nov. sp. et *Graptocarcinus texanus* Roemer, Crustacés Decapodés du Secondaire de la France. *Bull. natl. Hist. nat. Paris*, ser. 2, **27**(2), 160-163.

Roemer, F. A. (1887), *Graptocarcinus texanus*, ein Brachyure aus der oberen Kreide von Texas, *Nues. Jb. Miner. Geol. Paläont.*, Jg 1887, **1**, 173-176, 2 figs.

Taramelli, T. (1873), Escursioni geologiche fatte nell'anno 1872. *Ann. Sci. r. Ist. tecn. Udine*, **6**, 3-29, 1 pl.

Taramelli, T. (1877), Catalogo ragionato delle rocce del Friuli. *Mem. r. Acc. Lincei. Cl. Sci. fis. mat. nat.*, s. 3, **1**, 1-67, 7 pls.

Taramelli, T. (1881), *Spiegazione della carta geologica del Friuli (Provincia di Udine)*. 1-18. Pavia.

Van Straelen, v. (1936), Crustacés décapodes nouveaux ou peu connus de l'époque crétacique, *Bull. Mus. r. Hist. nat, Belg.*, **12**(45), 1-50, 4 pls., 2 figs.

Wright, C. W. and Collins, J. S. H. (1972), *British Cretaceous Crabs*. Palaeont. Soc. [Monogr.], Publication no. 533, part of vol. 126 for 1972, 1-114, 22 pls.

Manuscript received on 2nd, August, 1995; accepted on 6th, September, 1995.

イタリア北東部の Cenomanian Rudist Limestones 産十脚甲殻類

Joe S. H. Collins ・ Iginio Dieni

要　　旨

イタリア北東部の Cenomanian Rudist Limestones 産トゲカイカムリ科の１新種 *Graptocarcinus bellonii* とホンヤドカリ科に同定される鉗脚を記載する．両種の地理的分布は，南ヨーロッパにまで及ぶことになる．