



New occurrences of *Meyeria magna* M'Coy, 1849 (Decapoda, Mecochiridae) in the early Aptian and early Albian of the Basque Cantabrian Basin (North Spain)

Nuevos registros de Meyeria magna M'Coy, 1849 (Decapoda, Mecochiridae) en el Aptiense inferior y Albiense inferior de la Cuenca Vasco-Cantábrica (Norte de España)

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RESUMEN

En este trabajo se citan dos nuevos registros de la langosta *Meyeria magna* M'Coy, 1849 en series terrígenas de mar somero del Aptiense inferior y Albiense inferior aflorantes en la costa de Cantabria. Se acompaña una sucinta descripción y discusión taxonómica preliminares. Asimismo, el límite superior del rango estratigráfico de la especie queda bien establecido.

Key words: *Meyeria magna*, mecochiridae, Aptiense, Albiense, Norte de España.

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Introduction

Despite that lobsters are usually scarce in the fossil record, *Meyeria magna* is abundant in early aptian beds of the Isle of Wight (South England) where it was firstly described (M'Coy, 1849). Ammonite faunas from these lobster-beds indicate a *Deshayesites forbesi* Zone age (Casey *et al.*, 1998). *M. magna* has also been reported in the early Aptian of eastern Spain: Garraf (Calzada and Urquiola, 1999), beds of the *Deshayesites weissi* Zone (tethyan equivalent to the european *D. forbesi*) in Josa (Via, 1975; Moreno *et al.*, 2007), and Alcalá de Chivert and Torreblanca (Via, 1975). A wider palaeobiogeographical distribution is supported by its occurrence in the late Aptian of Colombia (Vega *et al.*, 2008) and by a inaccurately dated Aptian-Albian occurrence in Tibet (Wang, 1981).

This work is a preliminary account about new occurrences of *Meyeria magna* in shallow marine successions of Aptian-Albian age of the Basque-Cantabrian Basin (Fig. 1).

Stratigraphy

Early Aptian occurrence. *M. magna* occurs in the Marl Member (Wilmsen, 2005) of the Caranceja Formation (García-

Mondéjar, 1982), near the Cuchía village (Fig.1). This member is mainly composed of silty marls (Fig.1B) originated in the prodelta of a deltaic system that stablished after a main transgression in the earliest Aptian. Ammonites indicate the early Aptian *Deshayesites deshayesi* to *Tropaeum bowerbanki* Zones age (Collignon *et al.*, 1979).

The lobster exoskeletons are preserved on flat sideritic concretions. Articles of anomurans (Callianassidae) are found together.

Early Albian occurrence. Lobsters occur near the Ajo village (Fig.1), in siderite-concretions of an interval of silty marls. These marls are part of a near 300 metre-thick mainly calcarenitic succession of early Albian age (Baron-Szabo and Fernández-Mendiola, 1997) (Fig.1C), originated in a shallow marine carbonate platform with deltaic influence. Marl deposition may be interpreted as marine transgressive episodes. The succession is part of the Albian shallow marine carbonate platform that extended across the eastern area of the Cantabria province (e. g., fig. 2 of Baron-Szabo and Fernández-Mendiola, 1997).

Meyeria magna exoskeletons are slightly crushed. Frequent articulated specimens are interpreted as corpses. Claws

attributed to *Hoploparia* sp. and carapaces of *Cenomanocarcinus* sp. are the associated decapod fauna. The occurrence of *Douvilleicerias mammillatum* (Schlotheim) juv. indicates a late early Albian *D. mammillatum* SuperZone age (Fig. 2K, L).

Systematic account

Order Decapoda Latreille, 1802
Suborder Pleocyemata Burkenroad, 1963
Infraorder Astacidea Latreille, 1802
Superfamily Glypheoidea Winckler, 1883
Family Mecochiridae Van Straelen, 1925
Genus *Meyeria* M'Coy, 1849

Type species: *Meyeria ornata* (Phillips, 1829), by original designation.

Included fossil species: *M. bolivari* Van Straelen, 1927, *M. crofti* Ball, 1960, *M. gracilis* Glaessner, 1932, *M. harveyi* Woodward, 1900, *M. magna* M'Coy, 1849, *M. mexicana* Rathbun, 1935, *M. ornata* (Phillips, 1829), *M. pueblaensis* Feldmann and Vega in Feldmann *et al.*, 1995, *M. rapax* Harbort, 1905, *M. schwartzi* Kitchin, 1908

Meyeria magna M'Coy, 1849
(Fig. 2 A to J)

Comments. Simpson (unpubl. Palaeont. Soc. Monograph) revised the cretaceous representatives of Mecochiridae, erected

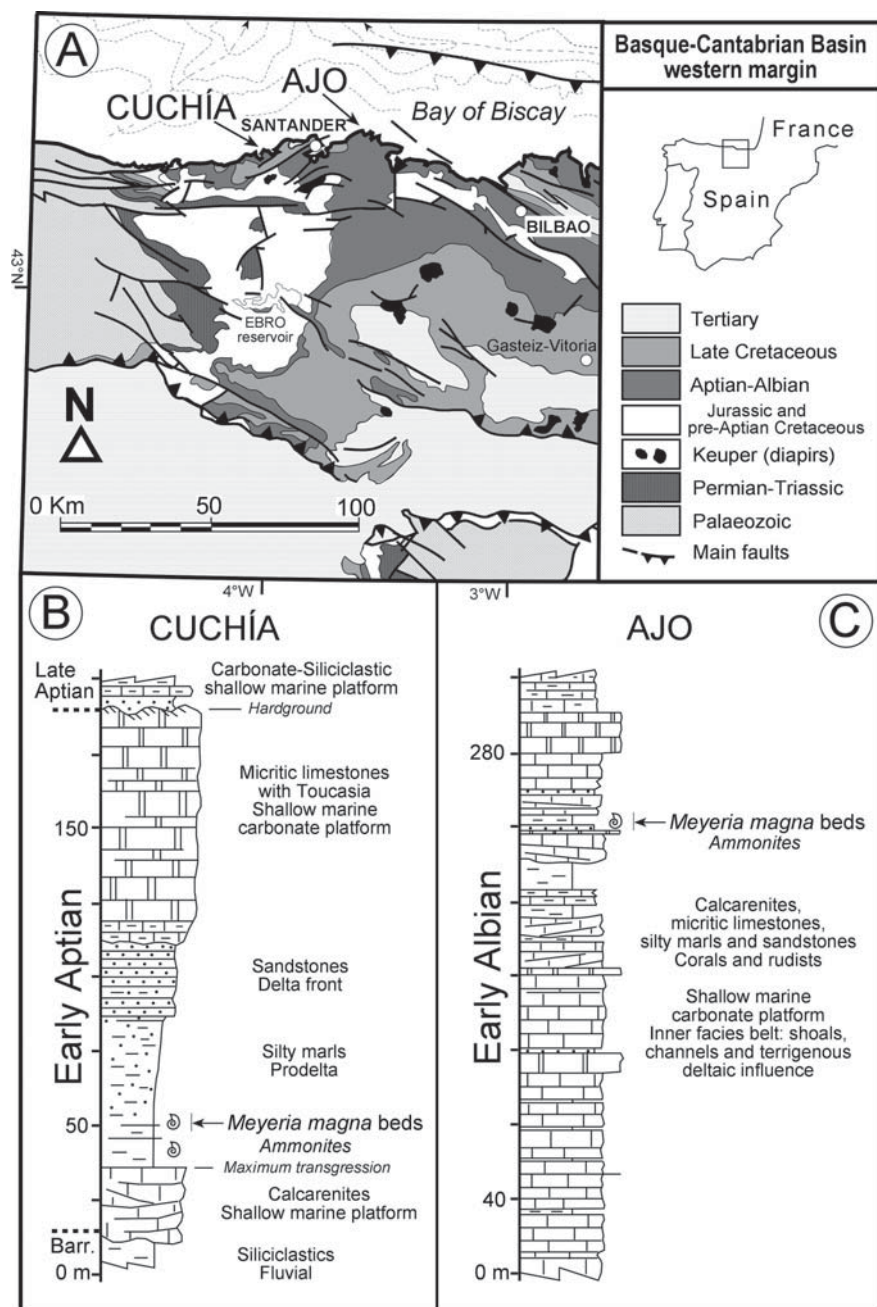


Fig. 1.- A. Geological map of the western margin of the Basque-Cantabrian Basin with location of the new occurrences of *Meyeria magna* M^cCoy, 1849. B, C. Stratigraphy of the early Aptian of Cuchía and early Albian of Ajo respectively, with indication of the *M. magna* beds (modified from Wilmsen, 2005 and from Baron-Szabo and Fernández-Mendiola, 1997, respectively).

Fig.1.- A. Mapa geológica del margen oeste de la Cuenca Vasco-Cantábrica donde se señalan las localidades con nuevos registros de *Meyeria magna* M^cCoy, 1849. B, C. Estratigrafía del Aptiense inferior de Cuchía y del Albiense inferior de Ajo, respectivamente, con indicación de las capas con *M. magna* (modificado de Wilmsen, 2005 y de Baron-Szabo y Fernández-Mendiola, 1997, respectivamente).

Meyerella nomen nudum and reinstated *Meyeria*, with *M. magna* and *M. ornata* as respective type species. In Simpson and Middleton (1985) the genus *Meyerella* is introduced and Aguirre Urreta (1989) followed these authors but the complete diagnosis of the new genus has not been published yet.

Description. Morphological characters are substantially shared by both new aptian and albian *M. magna*.

Carapace. Mainly around 63 % the length of the abdomen, with L/H ratios between 1,9 and 2,7. Rostrum no prominent. Cephalic region around 42% the carapace length, divided by a deep

cervical groove, forward inclined but shallowing and loosing dip toward the margin. Nearly parallel postcervical and branchiocardiac grooves very shallow and gently inclined forward. Hepatic groove slightly deep, backward inclined U-shaped. Inferior groove short. Three longitudinal ridges in the anterior region, the lower and middle sharp and bearing forward directed short spines. The lower ridge continues above hepatic ridge being less distinctive in the branchial area (r1; Fig. 2). There is a longitudinal ridge with subtle spines extending from the postcervical to branchiocardiac grooves (r2; Fig. 2); at this end a sharp and tuberculated ridge extends backward and bends downward near the margin (r3; fig. 2). Branchial area ornamented with evenly spaced tiny tubercles; the rest of the carapace is smooth.

Abdomen. Around one and a half the length of the carapace. Longitudinal dorsal ridge and two lateral ridges on terga, the strongest at the boundary with pleura, mostly tuberculated. Mid lateral and dorsal ridges losing strength backward; in albian forms mid lateral ridge is less marked and usually without tubercles. Transversal shallow grooves on terga. Somite 1 short with small pleura. Somite 2 is the largest, with almost three times the length of the first one. Somites 2-5 of similar shape, with broad pleura, decreasing in size backward; pleura with longitudinal ridge with tiny tubercles on mid part and strong boss in the lower part; anterior and posterior margin of pleura finely serrated in aptian specimens but also not tuberculated in albian ones. Somite 6 with triangular pleura. Telson as

Specimen	Cl	Ch	Al	Cl/Al (%)
A-5	64.0	29.8	100.0	64
A-11	59.6	24.8	81.1	73
A-21	59.2	24.4	97.7	61
A-29	45.0	17.4	72.5	62
A-30	67.8	31.8	103.5	65.5
A-34	55.4	-	75.5	73.4
A-35	43.9	17.9	69.5	63
A-45	36.3	18.5	63.5	57
A-63	69.0	25.4	102.5	67
A-67	54.4	25.3	88.0	62
A-76	63.9	27.8	109.0	58.6
C-1	42.0	-	64.0	65.6

Table I.- Measurements in mm of selected diagnostic specimens. Cl: carapace length. Ch: carap. height. Al: abdomen length. Cl/Al: Carap. length / Abd. length ratio in percentages.

Tabla I.- Medidas en mm de ejemplares diagnósticos seleccionados. Cl: longitud del caparazón. Ch: altura del caparazón. Al: longitud del abdomen. Cl/Al: ratio Long. capar./Long. abd. en porcentajes.

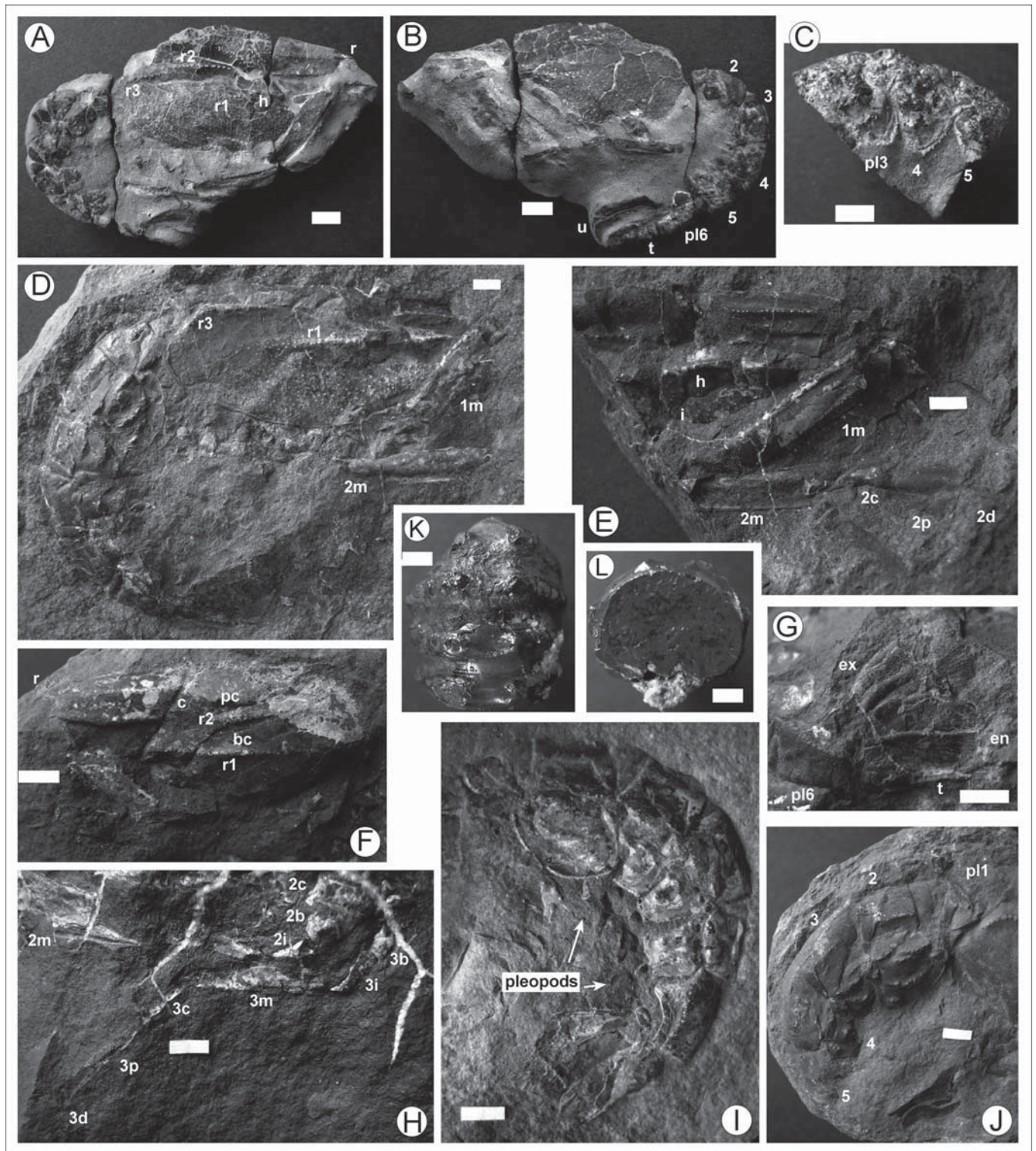


Fig. 2.- A-J, *Meyeria magna* M'Coy, 1849. A-C, Early Aptian, Cuchía. A. Specimen C-1, right side. B. Same specimen, left side, with indication of abdominal somites. C. Margins of abdominal pleura 3 and 4; C-4. D-J, Early Albian, Ajo. D. Specimen A-76. E. Partial carapace and pereopods; A-42. F. Carapace; A-13. G. Detail of the caudal fan; A-9. H. Pereopods 2 and 3; A-55. I. Well preserved abdomen with swimmerets; A-33. J. Detail of abdominal somites; A-66. Key: r, rostrum; grooves: c, cervical; pc, postcervical; bc, branchiocardiac; h, hepatic; i, inferior; r1, r2, r3, thoracic ridges; pereopods: 1, 2, 3 (c, coxa; b, basis; i, ischium; m, merus; c, carpus; p, propodus; d, dactylus); pl, abdominal somites (pleonites); t, telson; u, uropods (en, endopodite; ex, exopodite). K, L. *Douvilleicerax mammillatum* (Schlotheim) juv., ventral and whorl-section views respectively; A-77. Scale-bar: 5 mm.

Fig. 2.- A-J, *Meyeria magna* M'Coy, 1849. A-C, Aptiense inferior, Cuchía. A. Ejemplar C-1, lado derecho. B. Mismo ejemplar, lado izquierdo con indicación de los segmentos abdominales. C. Limbos pleurales 3 y 4; C-4. D-J, Albiense inferior, Ajo. D. Ejemplar A-76. E. Caparazón parcial con pereopodos; A-42. F. Caparazón; A-13. G. Detalle del abanico caudal; A-9. H. Pereopodos 2 y 3; A-55. I. Abdomen con pleópodos; A-33. J. Segmentos abdominales; A-66. Clave: r, rostrum; surcos: c, cervical; pc, postcervical; bc, branquiocardiaco; h, hepático; i, inferior; r1, r2, r3, crestas torácicas; pereopodos: 1, 2, 3 (c, coxa; b, base; i, ischium; m, merus; c, carpus; p, propodus; d, dactylus); pl, segmentos abdominales (pleonitos); t, telson; u, urópodos (en, endopodito; ex, exopodito). K, L. *Douvilleicerax mammillatum* (Schlotheim) juv., vistas ventral y de sección de espira; A-77. Barra de escala: 5 mm.

long as somite 6. Pleopods rarely preserved. Uropods triangular; diaeresis, from which longitudinal lirae extend toward the margin. Endopod and exopod with sharp and blunt longitudinal keel respectively.

Pereiopods. Pereiopod 1 with subtriangular ischium, about 25 % the length of carapace; merus rectangular. Pereiopod 2 subchelate, about 100% the length of carapace; merus about half the length of carapace with a keel on lower margin; carpus 25% the length of merus; propodus one third the length of merus with broad anterior part resembling a fixed finger; dactylus narrow, as long as propodus. Pereiopod 3 about 75% the length of the carapace; basis 25% the length of merus; ischium more than one third the length of merus; merus about 25% the length of carapace; carpus as long as ischium; propodus shorter than merus; dactylus shorter than propodus.

Material. Aptian specimens: repositories C-1 to 7, Cuchía, North Spain. Albian specimens: A-1 to 76, Ajo, North Spain. Housed in the Stratigraphy and Palaeontology dept., Univ. del País Vasco, Leioa, Spain.

Measurements. See table I.

Discussion

All studied specimens fit most of the diagnostic features of typical *M. magna* from the Isle of Wight (e. g., Woods, 1925-31). Albian specimens from Ajo bear a less ornamented margin of abdominal pleura than aptian ones from Cuchía, but this difference does not support a new species description.

Meyeria ornata (Neocom. of N-Europe) is more sculptured and lacks the typical ridges of the thoracic region of *M. magna*. *M. rapax* (Valang.-Hauter. of England, Germany and Argentina), *M. schwarzi* (Neocom. of S-Africa), *M. mexicana* (late Apt. of Mexico) and *M. pueblaensis* (Apt. of Mexico) are, among other differences, less ornamented than *M. magna* but all of them bear at least one ridge on the posterior region of the carapace. The number of thoracic ridges increases from earliest cretaceous species with no ridges (*ornata*) or one ridge (e. g., *rapax*) to aptian-albian species with three ridges (e. g., *magna*). The above

cited features may support a different genus, at least for *M. magna* (e.g., Simpson and Middleton, 1985); however, *M. magna* from Colombia (Vega *et al.*, 2008) bears a shorter propodus of the pereopod 1 for the species and *M. rapax* from Argentina (Aguirre Urreta, 1989) shows an inferior groove that reaches the ventral border of the carapace.

Based on a morphometric and phylogenetic analysis of 12 species of Mecochiridae (Astrop, 2007), Vega *et al.* (2008) point out that *M. rapax*, *M. magna* and *M. pueblaensis* could be assigned to a new genus since these species do not nest with the type species *M. ornata*; however, the same authors do not consider this hypothesis until additional work could support it.

Mecochiridae has been traditionally placed within Palinura (Glaessner, 1969) because of their short anterior region of carapace, spinose ornament and lack of true chela. Since there are no living representatives of this family Forest and de Saint Laurent (1989) followed this placement. However, Feldmann *et al.* (2002) placed Mecochiridae within the Astacidea on the basis of their cylindrical carapace cross-section reflecting a narrow sternum, well defined rostrum and groove pattern, pointing out that the lack of true chela occurs across infraordinal lines.

Conclusions

Two new occurrences of *Meyeria magna* M'Coy, 1849 in North Spain (Cantabria province) are recorded: 1-early Aptian, Caranceja Formation, Cuchía; and 2-early Albian, shallow marine carbonate platform unit, Ajo.

An accurate stratigraphical range for the species is supported: early Aptian to late early Albian.

Both new aptian and albian stocks share the main characters with the typical *Meyeria magna* from the Isle of Wight.

The new aptian occurrence is the palaeobiogeographical nexus between Eastern Iberian occurrences and Southern England ones.

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