DECAPOD CRUSTACEAN BODY AND ICHNOFOSSILS FROM THE MESOZOIC OF PORTUGAL

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Rift basins from the Mesozoic of Portugal record very interesting and important contributions for understanding the phylogeny and biogeography of decapod crustaceans and relations with the evolution of fossorial behavior and infaunalisation for several clades. The decapod crustaceans body fossils are restricted to the Oxfordian–Kimmeridgian and Lower Cretaceous deposits from the Lusitanian Basin. At least the following genera are known: *Longodromites*, *Pithonoton*, *Eodromites*, *Magila, Meyeria, Mecochirus*, and *Glyphea*. Wehner (1988: p. 132) listed three brachyuran crabs from the mid-Oxfordian Cabaços Formation? (Torres Vedras): the longodromitid *Longodromites excisus* (v. Meyer, 1857), and goniodromitids including *Pithonoton marginatum* v. Meyer, 1842 and *Eodromites grandis* (v. Meyer, 1857). The axiid shrimp *Magila* sp. was reported by Werner (1986) from the *Thracia-Corbulomima* assemblage (Early Kimmeridgian) at Consolação (Peniche municipality). Three lobster genera are known: *Mecochirus* Germar, 1827 (Mecochiridae) is reported from the Kimmeridgian Alcobaça Formation at Barrio (F.T. Fürsich, 1999 in http://paleodb.org) and from Valanginian-Hauterivian and Albian in three different localities from Lisbon region (*Mecochirus* aff. *longimanatus*: Ferreira, 1955);

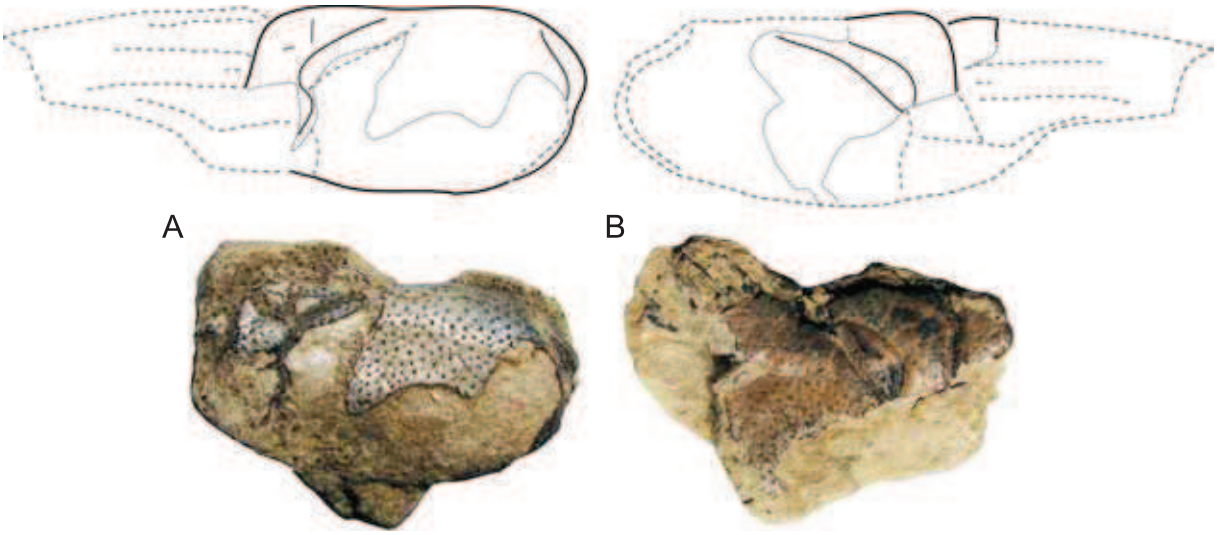

Fig. 1. Carapace of *Glyphea* sp. (FCT-UNL 703) from the Kimmeridgian of Praia dos Salgados, Portugal, in lateral left and right views

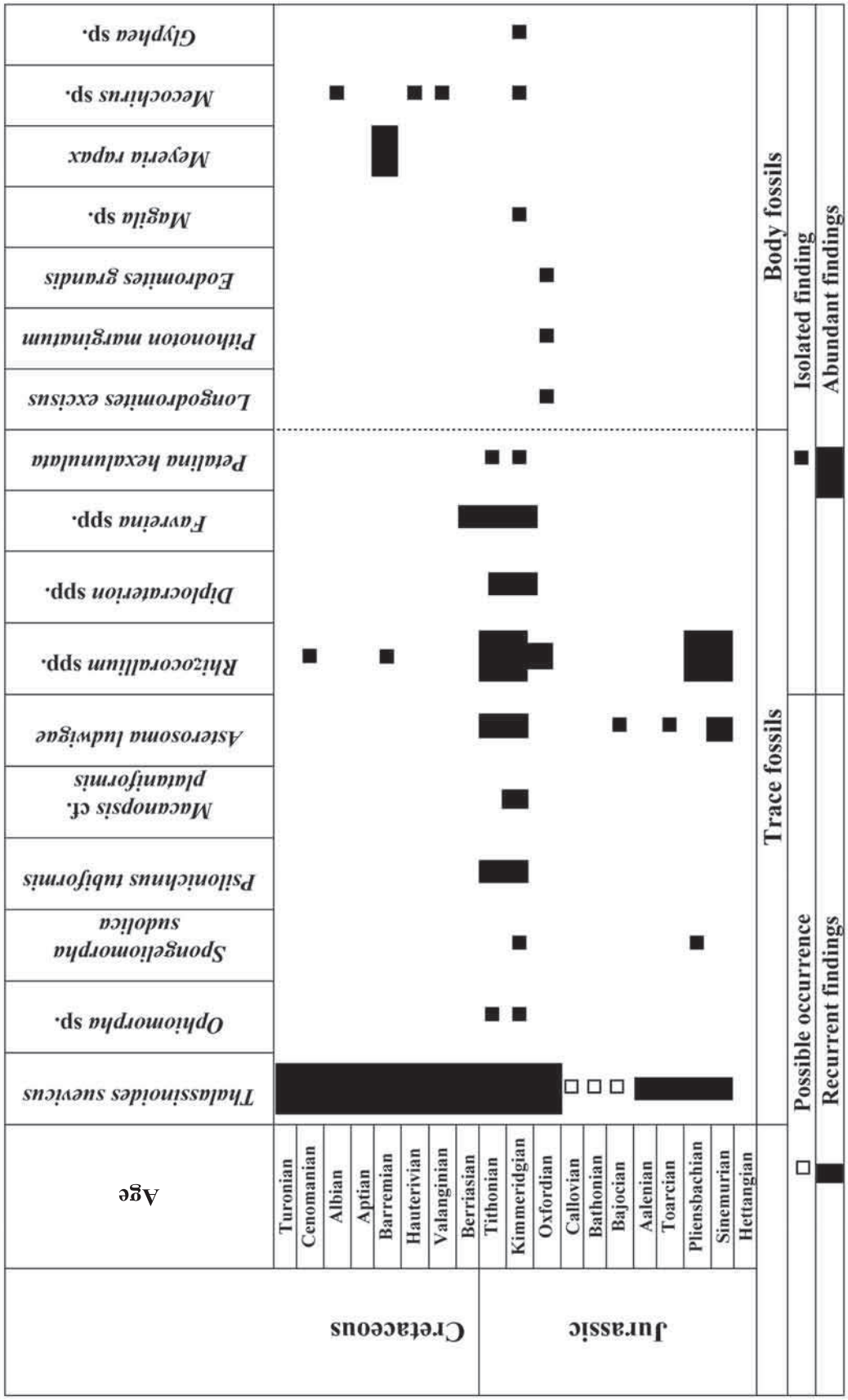

Fig. 2. Time-abundance chart of decapod body fossils and decapod-related trace fossils in the Mesozoic of Portugal

Meyeria rapax (Harbort, 1905) is known from the Barremian Boca do Chapim Formation (*Mecochirus rapax* in Neto de Carvalho *et al*., 2007); and *Glyphea* von Meyer, 1835 (Glypheidae) is here documented from Kimmeridgian sediments from Praia dos Salgados (collected by OM, 2000). In these specimens (FCT-UNL 703; Fig. 1), the branchiocardiac and postcervical grooves are similar to *Glyphea* spp. as in Amati *et al*. (2004), Feldmann and Maxwell (1999), Feldmann and De Saint Laurent (2002). Additionally, several indeterminate decapods from the Kimmeridgian of São Martinho do Porto are known (collected by OM, 2000).

Besides body fossils, the Mesozoic of Portugal has yielded several ichnotaxa produced by crustaceans including burrows and fecal pellets (or microcoprolites; Fig. 2). Fürsich (1981) recognized the presence of several ichnotaxa in the Late Jurassic of the Lusitanian Basin, namely: *Diplocraterion habichi* (Lisson, 1904), *D. parallelum* Torell, 1870 (both produced perhaps by shrimp or amphipods); *Ophiomorpha* isp. (gebiidean and axiidean shrimps), *Psilonichnus tubiformis* Fürsich, 1981 (mud and ghost shrimps and brachyuran crabs), *Rhizocorallium irregulare* Mayer, 1954 (probably crustaceans), and *Thalassinoides suevicus* (Rieth, 1932) ("thalassinidean" mud shrimps and lobsters). All represent temporary or permanent burrow structures. Neto de Carvalho *et al*. (2010) unequivocally showed that the lobster *Meyeria rapax* was the producer of the burrow *Thalassinoides suevicus* and provided an overview of Lower Jurassic–Upper Cretaceous crustacean-related ichnofossils from Portugal and added the crustacean burrows *Asterosoma ludwigae* Schlirf, 2000 (?decapod, see also Neto de Carvalho, Rodrigues, 2007), *Macanopsis plataniformis* Muńiz & Mayoral, 2001 (brachyuran crab), *Spongeliomorpha sudolica* (Zaręczny, 1878) (thalassinidean shrimps) and *Rhizocorallium jenense* Zenker, 1836 (crustacean among others). The oldest burrows are known from the Sinemurian (*Rhizocorallium* and *Thalassinoides*) extending to the Turonian (Fig. 2). In addition to burrows, crustacean microcoprolites are also known. Ramalho (1971) recognized *Favreina* cf. *F. salevensis* (later identified as *Favreina guinchoensis* Brönniman, 1976) from the Late Jurassic, and also found some *Favreina* coprolites from the Valanginian of Portugal. Leinfelder in Schweigert *et al*. (1997) reported on the microcoprolites *Petalina hexalunulata* Leinfelder, 1997 and *Favreina prusensis* (Paréjas, 1948) from the Kimmeridgian Ota Limestone. *Favreina* is known from the Sinemurian to the base of the Valanginian in Portugal and may be related with the family Thalassinidae.

Decapod trace fossils are preserved commonly in environments where body fossils may be found, but are usually rare. Therefore, a combined study involving both body and trace fossils provide a more thorough assessment of the evolutionary and biogeographic history of decapods. This synthesis is just the beginning of a more comprehensive work.

Institutional abbreviations

FCT-UNL: Faculdade de Ciências e Tecnologia da Univ. Nova de Lisboa, Portugal.

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