

Short communications

Report of *Maja* cf. *Maja squinado* (Herbst, 1788) (Crustacea, Brachyura, Majidae) from the Early Pliocene of Cheglio (Varese, northern Italy)

Giovanni Pasini¹, Alessandro Garassino^{2*}

Abstract - We report *Maja* Lamarck, 1801 with *Maja* cf. *Maja squinado* (Herbst, 1788) from the Early Pliocene of Cheglio (Varese, northern Italy). This is the second record of fossil brachyuran from this locality and from the Early Pliocene of Lombardy (northern Italy), increasing the very poorly knowledge on the presence and distribution of the late Cenozoic decapods fauna in the northern area of the paleo-Adriatic Gulf.

Key-words: Crustacea, Decapoda, Brachyura, Majidae, Early Pliocene, Italy.

Riassunto - Segnalazione di *Maja* cf. *Maja squinado* (Herbst, 1788) (Crustacea, Brachyura, Majidae) nel Pliocene inferiore di Cheglio (Varese, Italia settentrionale).

Viene segnalata *Maja* Lamarck, 1801 con *Maja* cf. *Maja squinado* (Herbst, 1788) del Pliocene inferiore di Cheglio (Varese, Italia settentrionale). Si tratta della seconda segnalazione di un brachiuro fossile in questa località e nel Pliocene inferiore della Lombardia (Italia settentrionale). Questa scoperta allarga le scarse conoscenze sulla presenza e distribuzione dei decapodi nel tardo Cenozoico nell'area settentrionale del Golfo paleo-Adriatico.

Parole chiave: Crustacea, Decapoda, Brachyura, Majidae, Pliocene inferiore, Italia.

INTRODUCTION

The fossil record of Cenozoic decapods from the Pliocene of Lombardy is very scarce to date. Indeed the only species formally reported is *Eriphia* cf. *E. cocchii* Ristori, 1886 from the Early Pliocene of Cheglio (Taino, Varese), based on a single right complete propodus (Pasini & Garassino 2011). The studied specimen was discovered from the same layers nearby Cheglio (45°46'0"N, 8°37'0"E), where a strip of Early Pliocene micaceous green blue sands and silstones crop out (Pasini & Garassino 2011).

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MATERIALS

One incomplete right dactylus, preserved within a little block of micaceous blue sand. The specimen was fixed by a polyacrylic glue solution for preparation and study for the fragile nature of the fossil. The studied specimen is housed in the palaeontological collections of the Museo di Storia Naturale di Milano (MSNM).

SYSTEMATIC PALAEOLOGY

Superfamily Majoidea Samouelle, 1819

Family Majidae Samouelle, 1819

Subfamily Majinae Samouelle, 1819

Genus *Maja* Lamarck, 1801

Type species: *Cancer squinado* Herbst, 1788, subsequent designation by ICZN (1958: Opinion 511).

Included fossil species: see Schweitzer *et al.* (2010) and Garassino *et al.* (2012).

Maja cf. *M. squinado* (Herbst, 1788)

Figs. 1, 2

Material and measurements: One incomplete right dactylus 18 mm long. (MSNM i27874).

Description: Elongate slender dactylus, finely granulate dorsally, nearly straight, slightly curved downward distally; transverse section subrectangular proximally towards the articulation with the palm, and slightly compressed laterally, becoming subrounded towards the tip; unarmed occlusal margin with a median longitudinal finely serrate ridge, slightly convex and subtriangular in outline proximally, becoming straight dorsally and less marked towards the rounded pointed tip.

Discussion: Even though the studied specimen is poorly preserved, it shares morphological characters with the morphology of the dactylus of *Maja* Lamarck, 1801, as follows: the dorsal granulation; the elongate nearly straight form, slightly curved downward distally, with subrounded transverse section; and the peculiar shape of the ridge on the cutting inner margin. Three extant species of *Maja* live in the Mediterranean Sea, *Maja crispata* Risso, 1827, *M. goltziana* d'Oliviera, 1888, and *M. squinado* (Herbst, 1788). These species share similar dactyli

but *M. goltziana* is an eurybathic species with very recent subtropical origin, inhabiting only the most south-eastern Mediterranean area without fossil records, whereas the more widespread *M. crispata* has never been recognised as fossil to date. So, the only fossil species known to date from the Cenozoic of the Mediterranean area is *M. squinado*, previously reported from different localities in Italy by complete specimens and loose dactyli. Indeed, the studied specimen could be compared with the right dactylus of an adult extant specimen of *M. squinado*, collected from the Adriatic Gulf (Mediterranean Sea) (Fig. 2). Moreover, the specimen has been also compared with the two fossil dactyli having similar characters reported by Ristori (1891a, Pl. 1, fig. 28), from the Early Pleistocene of Monte Mario, Rome (central Italy), and by Varola (1981, Pl. 3, fig. 1) from the middle Pliocene of Rocca Vecchia (Lecce, southern Italy), both assigned to *Maja squinado*. Therefore, based on the above-mentioned characters and size, lacking comparative fossil records for the others two

extant Mediterranean species, the studied specimen is tentatively compared and assigned to a juvenile individual of *Maja squinado*. This species has been previously reported in Italy from the Pliocene of Monte Mario (Roma), Rocca Vecchia (Salentina Peninsula, Puglia), Capo San Marco (Sardinia), Arda river (Emilia Romagna), Masserano (Piedmont) and La Serra quarry (Tuscany) (Meneghini, 1857; Ristori, 1891 a, b; Varola, 1981; Garassino & De Angeli, 2004; Pasini & Garassino, 2009; Garassino *et al.*, 2012) and from the Pleistocene of Monte Pellegrino (Sicily) (Gemmellaro, 1914). The specimens reported from the Pliocene of Monte Mario (Rome) by Ristori (1891b) could be probably assigned to the Santernian (Early Pleistocene) (Cosentino *et al.*, 2009). Substantially, this is the second report for the species along the northern borders of the paleo-Adriatic Gulf, increasing the scarce knowledge on the presence and distribution of the decapods crustacean fauna from this Mediterranean area during the Pliocene.

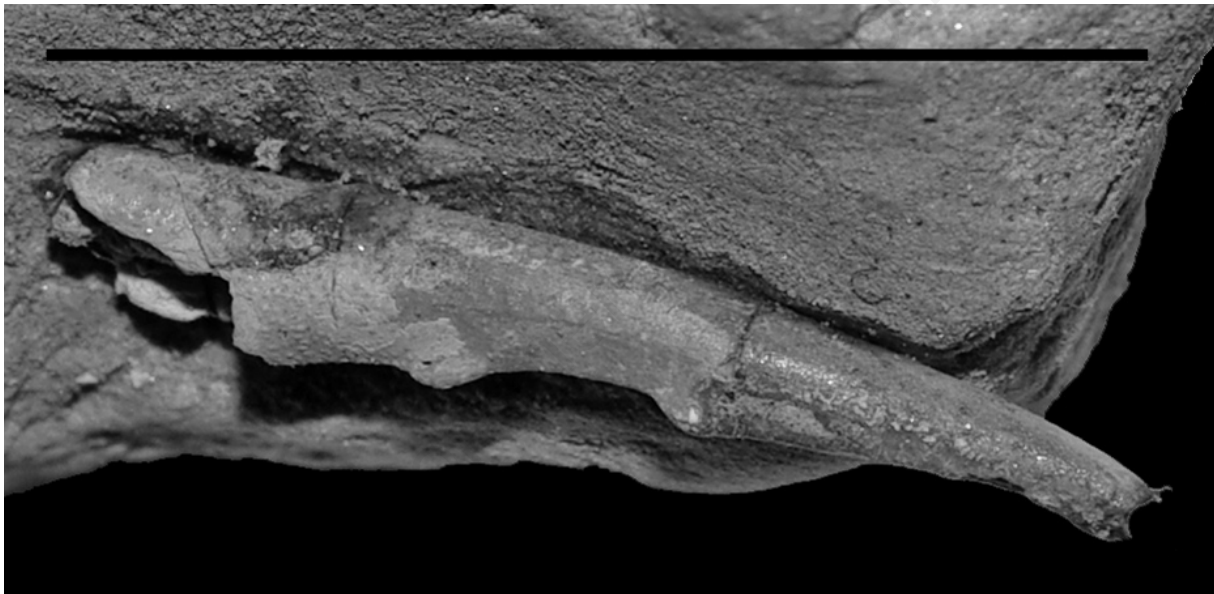


Fig. 1 - *Maja* cf. *M. squinado*, MSNM i27874, right dactylus. Scale bar 17 mm.

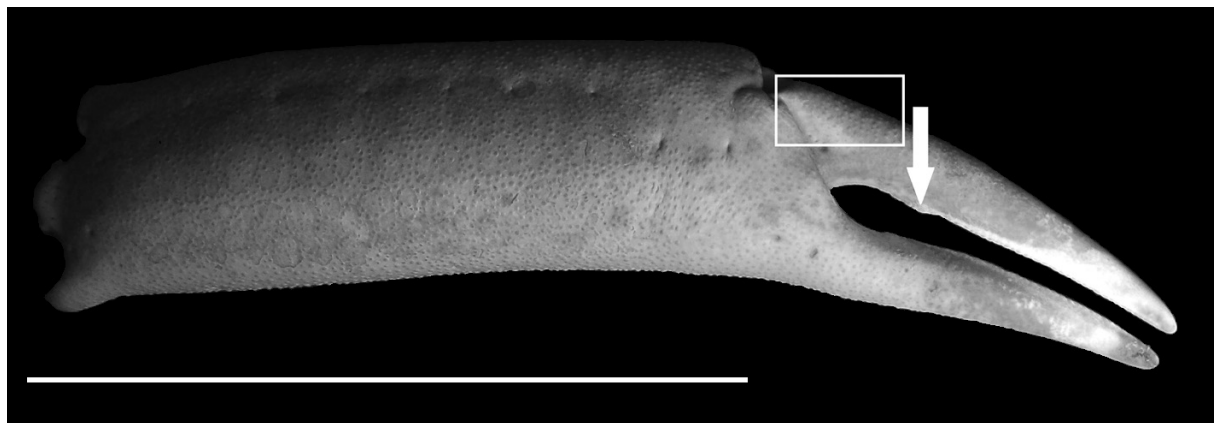


Fig. 2 - Extant *Maja squinado*, right cheliped; fine granulation of the dorsal surface of the dactylus (rectangular) and occlusal ridge, slightly convex and subtriangular in outline proximally (arrow) (adult female, Mediterranean Sea). Scale bar 120 mm.

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***In situ* hermit crab (Anomura, Paguroidea, Diogenidae) from the Pliocene of Castelnuovo Berardengo, (Siena, Tuscany, Italy)**

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Abstract - We report an *in situ* specimen of hermit crab ascribed to *Dardanus substriatus* (A. Milne Edwards, 1861) (Diogenidae Ortmann, 1892), from the Pliocene of Castelnuovo Berardengo (Siena, Tuscany, central Italy). Diogenidae *in situ* are rarely reported in the fossil record, so in spite of the poor preservation of the studied specimen, it represents the first report for this species from the paleo Mediterranean basin.

Key-words: Anomura, Paguroidea, Diogenidae, Pliocene, Tuscany, Italy.

Riassunto - Paguro *in situ* del Pliocene di Castelnuovo Berardengo (Siena, Toscana, Italia). Viene riportato il ritrovamento di un esemplare di paguride *in situ* attribuito a *Dardanus substriatus* (A. Milne Edwards, 1861) (Diogenidae Ortmann, 1892) del Pliocene di Castelnuovo Berardengo (Siena, Toscana, Italia). Le segnalazioni di Diogenidae *in situ* nel record fossile sono estremamente rare. Malgrado l'incompletezza dell'esemplare studiato, si tratta della prima segnalazione di un esemplare *in situ* di questa specie nel bacino paleo Mediterraneo.

Parole chiave: Decapoda, Anomura, Paguroidea, Diogenidae, Pliocene, Toscana, Italia.

INTRODUCTION

The *in situ* hermit crabs (Paguroidea Latreille, 1802) from the fossil record of Italy are very scarce (see Pasini & Garassino, 2010a: 105), especially among the Diogenidae. Indeed, just two records are reported to date: *Paguristes baldoensis* Garassino, De Angeli & Pasini, 2009 from the Early Eocene of Monte Baldo (Verona, Veneto, NE Italy); and an indeterminate Diogenidae from the Early Pliocene of Campore (Parma, Emilia Romagna, N Italy) (Garassino *et al.*, 2009; Pasini & Garassino, 2010a). Based on these previous reports, this new discovery of an *in situ* diogenid increases the general knowledge about the ecological behavior of the Diogenidae during the late Cenozoic in the paleo Mediterranean basin.

The studied specimen was collected loose on the surface from a tilled land in the outcrops of Castelnuovo Berardengo, located E of Siena (Tuscany, central Italy) (F. Pizzolato, pers. comm., 2014). This area includes marine deposits ranging from the Early Pliocene to the Early Pleistocene (Baldanza *et al.*, 2013: 336, 337, Fig. 1). We ascribe the studied specimen generically to the Pliocene *sensu lato* because of the absence of chronostratigraphic data.

MATERIALS

The studied specimen consists in a right propodus three-dimensionally preserved *in situ* within a laterally compressed and incomplete inner mould of a gastropod shell, in turn preserved in a small (30 x 25 mm) subnodular, washed calcareous concretion. The original shell was probably dissolved during the diagenesis process or more recently due to the burial exposure; only the last terminal part of the helicoidal spire and part of the peristoma are observables as inner cast. The incomplete right propodus is exposed in dorsal view and in life position within the last spire of the gastropod. The specimen is housed in the Museo di Storia Naturale dell'Accademia dei Fisiocritici, Siena (MUSNAF). For the higher-level classification we follow the recent arrangement proposed by De Grave *et al.*, (2009).

Abbreviations

hpa: height of the palm; ld: length of the dactylus; li: length of the index; lpa: length of the palm.

SYSTEMATIC PALAEOLOGY

Order Decapoda Latreille, 1803
 Infraorder Anomura MacLeay, 1838
 Superfamily Paguroidea Latreille, 1802
 Family Diogenidae Ortmann, 1892
 Genus *Dardanus* Paul'son, 1875

Type species: *Dardanus hellerii* Paul'son, 1875, by monotypy.

Included fossil species: see Schweitzer *et al.* (2010); Garassino *et al.* (2014).

Dardanus substriatus (A. Milne Edwards, 1861)
 Fig. 1 A, B

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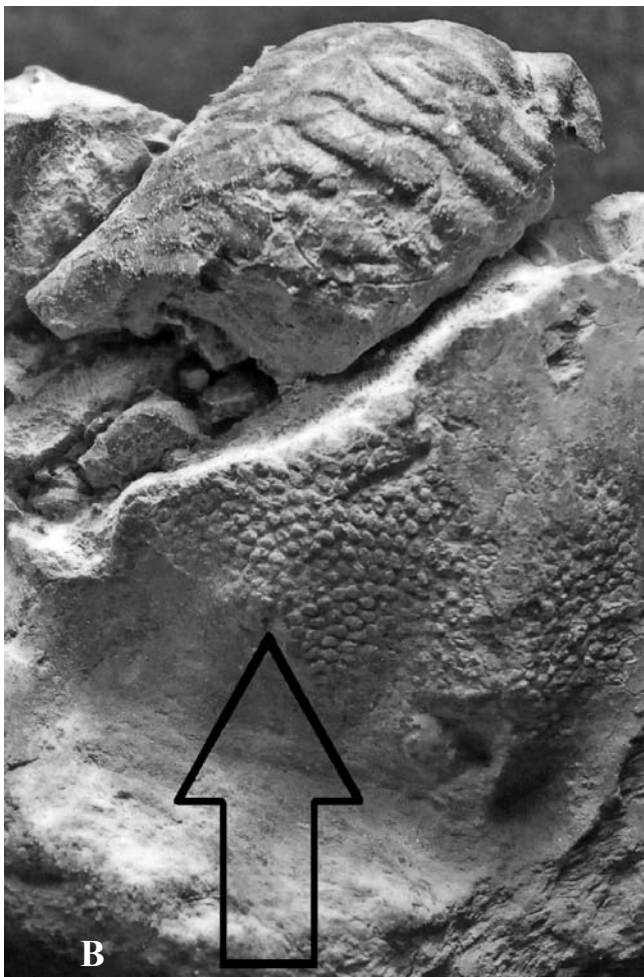


Fig. 1 - A) *Dardanus substriatus* (A. Milne Edwards, 1861), MUSNAF 7077, right cheliped *in situ*. Scale bar equal 7 mm. B) Detail of the specimen showing the bryozoans encrusting the inner shell of the “hermited” gastropod (?Muricidae) (black arrow). Scale bar equal 17 mm.

Material and measurements: one right propodus *in situ* (MUSNAF 7077 – hpa: 8 mm; ld: 6 mm; li: 5 mm; lpa: 8 mm).

Description: Palm as long as high, with upper and lower cristate margins slightly converging anteriorly; palm covered with sinuous transverse crests, dentate anteriorly; index and dactylus only partially preserved; subtriangular index, wider at the base; subtriangular and curved dactylus slightly longer than the index.

Discussion. The studied propodus has a shorter subsquare palm with upper and lower margins converging anteriorly with numerous raised crests interlaced each other like “scale fish”, differing in outline and ornamentation from those of the similar fossil and extant Mediterranean species *Dardanus arrosor* (Herbst, 1796) having more elongate palm longer than high, with upper and lower margin almost parallel. Based upon the subsquare palm with upper and lower margins converging anteriorly the studied propodus is assigned to *D. substriatus* (A. Milne Edwards, 1861), previously reported from the Pliocene of Piedmont (Sismonda, 1846; A. Milne Edwards *in* Sismonda, 1861); Tuscany (Ristori, 1886; De Angeli *et al.*, 2009); from the Early Pliocene (now Early Pleistocene, see Baldanza *et al.*, 2013) of Umbria (Pasini & Garassino, 2010b); and from the Early Pleistocene of Calabria (Garassino *et al.*, 2014). Due to the poor preservation of the shell, a systematic attribution of the hosting gastropod is impossible. We point out, however, that the margin of the external edge shows some alternate rounded tubercles, character common to the representatives of many different marine gastropod families. The interior surface of the peristoma is typically encrusted by bryozoans (observables as cast on the surface of the shell mould), as it is usually recorded in fossil and extant “hermited” shells (*sensu* Walker, 1992) (Fig. 1 B). Finally, this report results to be the first in the fossil record for an *in situ* specimen of *D. substriatus* from the paleo Mediterranean area.

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