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*Anapagurus mamertinus* n. sp.  
(Anomura, Paguroidea, Paguridae) from the Pliocene  
of S. Antonio, Capo Milazzo (Sicily, S Italy)

**Abstract** - We document for the first time the presence of *Anapagurus* Henderson, 1886 (Paguridae Latreille, 1802) with *Anapagurus mamertinus* n. sp., from the Pliocene of S. Antonio, Capo Milazzo (Sicily, S Italy). It is the first report of this genus from the Pliocene of Italy, enlarging the knowledge on its distribution in the palaeo-Mediterranean area. *Anapagurus* was known to date with *A. sp.* from the Pleistocene of Arda River (Emilia Romagna, N Italy).

**Key words:** Crustacea, Anomura, Paguridae, Pliocene, Italy.

**Riassunto** - *Anapagurus mamertinus* n. sp. (Anomura, Paguroidea, Paguridae) nel Pliocene di S. Antonio, Capo Milazzo (Sicilia, Italia meridionale).

Viene segnalata la presenza di *Anapagurus* Henderson, 1886 (Paguridae Latreille, 1802) con *Anapagurus mamertinus* n. sp., nel Pliocene di S. Antonio, Capo Milazzo (Sicilia, S Italia). Si tratta della prima segnalazione di questo genere nel Pliocene italiano, allargando le conoscenze sulla distribuzione del genere nell'area paleo-Mediterranea. *Anapagurus* era conosciuto finora con *A. sp.* del Pleistocene del torrente Arda (Emilia Romagna, N Italia).

**Parole chiave:** Crustacea, Anomura, Paguridae, Pliocene, Italia.

### Introduction and geological setting

The Milazzo peninsula (Messina province) spread out in the Tyrrhenian Sea in the NE of Sicily (S Italy) (Fig. 1). S. Antonio is located on the left coast, near the northern tip of the peninsula. Here an alternate succession of white and yellow marls and marly-limestones crop out about fifty metres above the sea level. The marine faunal assemblage includes molluscs, bamboo corals (*Isidella*) and cirripeds of bathyal environment (Ruggeri & Greco, 1965; Fois, 1990). On the basis of the invertebrate fauna, these levels are assigned to the Pliocene (Late Neogene)

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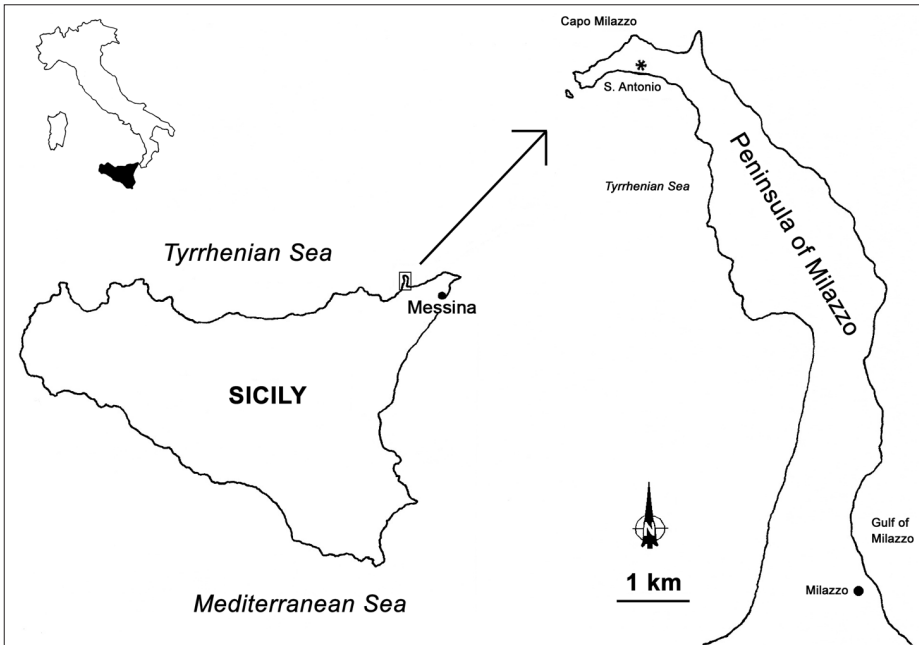


Fig. 1 - Geographic map of Sicily with the fossiliferous locality (\*) /Cartina geografica della Sicilia con la località fossilifera (\*).

(Fois, 1990; Palazzi & Villari, 1996). The studied specimens come from the white marly-limestones of the succession (Bertolaso pers. comm., 2009).

### Previous records of *Anapagurus* from Italy

Fossils hermit crabs from Sicily are nearly unknown to date. The only record of anomuran crustaceans belonging to Paguridae Latreille, 1802, in the Neogene of Sicily is limited to one report by Gemmellaro (1914: 75, 92) who documented the presence of an indeterminate *Pagurus* sp. from the Upper Pleistocene of Ficarazzi (Palermo) on the basis of some incomplete propodi.

*Anapagurus* Henderson, 1886, instead, is reported by Garassino & De Angeli (2004) who described a single small-sized propodus from the Pleistocene of Arda River (Emilia Romagna, N Italy), ascribed to *Anapagurus* sp. So the studied sample represents the first report of this genus from the Pliocene in Italy, enlarging the knowledge on its geographical distribution in the palaeo-Mediterranean Basin.

### Material

The studied sample consists in six small right propodi, one left propodus, three right movable fingers and two right carpi. Also some fragmentary movable fingers, small parts of the carapace or pereopods belonging to others groups of brachyurans (?Xanthoidea and Leucosidae) are present in the associated material but their partial and poor preservation do not allow any generic and specific determination.

The studied specimens are disarticulated, loose in the sediment and were obtained by dry-sieving of the soft and incoherent matrix.

The studied specimens are housed in the Palaeontological Collections of the Museo di Storia Naturale, Milano (MSNM).

The systematic arrangement used in this paper follows the recent classification proposed by Schweitzer *et al.* (2010).

### Systematic Palaeontology

Infraorder Anomura MacLeay, 1838  
 Superfamily Paguroidea Latreille, 1802  
 Family Paguridae Latreille, 1802  
 Genus *Anapagurus* Henderson, 1886

Type species: *Pagurus laevis* Bell, 1845, by original designation.

Included fossil species: *A. laevis* (Bell, 1845) (Pliocene - The Netherlands); *A. marginatus* Müller, 1979 (middle Miocene, Badenian - Hungary); *A. mioce-nicus* Müller, 1979 (middle Miocene, Badenian - Hungary).

*Anapagurus mamertinus* n. sp.

Fig. 2

**Diagnosis:** right propodus with straight dorsal margin, slightly convex ventral margin, strongly curved distally; lateral margins convex, crossed longitudinally by a tuberculated smooth ridge; dorsal and ventral margins with a ridge of small prominent denticles or spinules; fixed finger triangular, pointed, with notably curved, upward ventral margin; fixed finger with occlusal margin proximally spooned, with five strong, grouped globular teeth, located posteriorly; movable finger with dorsal margin with smooth granulated tubercles on the dorsal part and two divergent high tubercles on the upper of the proximal articulated margin; movable finger with occlusal margin with four-five distinct globular teeth, decreasing in size toward the tip; right carpus short, with a median lateral granular ridge; convex outer surface with granulations anteriorly, smooth proximally, ornated dorsally by a crest of small prominent spines, with a divergent aligned row of four tubercles; dorsal and ventral margins with a small prominent spine near concave carpo-propodial articulation; left propodus with a ridge running along the ventral margin rounded progressively distally; palm with a pointed fixed finger spooned, with some irregular teeth proximally.

**Etymology:** the trivial name alludes to Mamertini Italic people, mercenary soldiers that in the III Century B. C. seized Messina, the originary cause of the first Punic war.

**Holotype:** MSNM i24476 (consisting of right carpus, right propodus and right movable finger).

**Paratypes:** MSNM i24477 (consisting of right carpus, left propodus, five right propodi, and two right movable fingers).

**Geological age:** Pliocene.

**Type locality:** S. Antonio, Capo Milazzo (Messina, Sicily).

**Occurrence and measurements:** six right complete propodi, length between 6 and 12 mm; two complete right carpi respectively 6 and 4 mm in length; one complete left propodus 4 mm in length; three complete right movable fingers length between 4 and 5.5 mm.

**Description.** Right propodus strong, subquadrate, as long as wide. Straight dorsal margin, slightly convex ventral margin, strongly curved distally. Lateral margins convex, crossed longitudinally by a tuberculated smooth ridge running about medially in propodus. Carpo-propodial articulation vertical, gently convex on the middle and oblique to the longitudinal axis. Dense thick granulated ornamentation on the outer side, with dorsal and ventral margins with a ridge of small prominent denticles or spinules. Dorsally a parallel tuberculated aligned ridge runs in the half posterior part, ending with a small rounded point. Inner surface smooth, with irregular sparse granulations. Palm with swollen outer margin. Fixed finger triangular, pointed, with notably curved, upward ventral margin. Occlusal margin proximally spooned, with five strong, grouped globular teeth, similar in size located posteriorly. Interdigital margin slightly concave and vertical. In dorsal view the propodus is very curved toward the body and, in section, the outline is subglobular, asymmetric.

Right movable finger asymmetric in section, with subtriangular shape, rounded tip, strong, short, moderately convex. Slightly curved dorsal margin with smooth granulated tubercles on the dorsal part and two divergent high tubercles on the upper of the proximal articulated margin. Occlusal margin with four-five distinct globular teeth, decreasing in size toward the tip, outer margin with irregular granulations, a prominent tubercle in outer proximal lateral side.

Right carpus short, subtriangular in shape, globular to rhomboid in section, with a median lateral granular ridge. Convex outer surface with granulations anteriorly, smooth proximally, ornate dorsally by a crest of small prominent spines, with a divergent aligned row of four tubercles. Longitudinal median granular ridge cross both sides determining the globular-rhomboid section. Inner surface convex, with

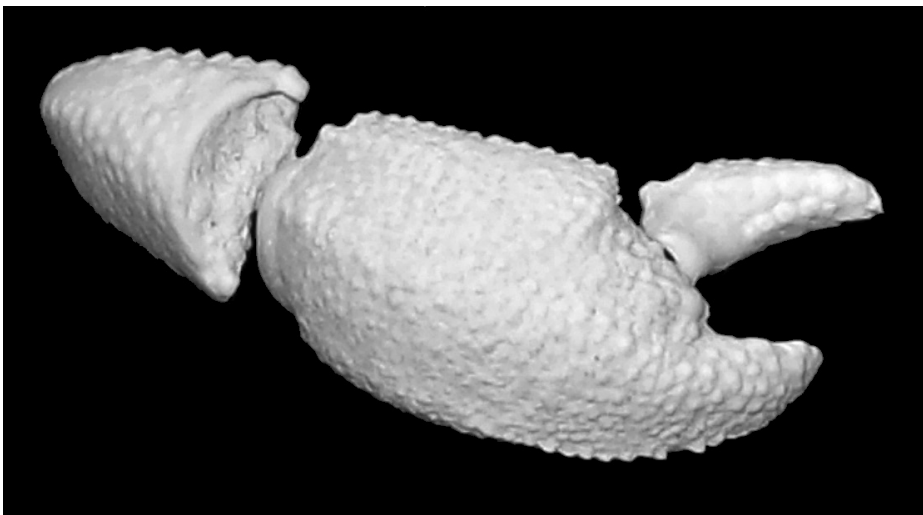


Fig. 2 - *Anapagurus mamertinus* n. sp. Holotype/Olotipo, MSNM i27476 (x 8).

sparse tubercles. Dorsal, ventral margins with a small prominent spine near concave carpo-propodial articulation. Carpo-merus articulation shorter, very oblique respect longitudinal axis.

Left propodus, small, elongate, much slender than right one, highest distally, with a ridge running along the ventral margin rounded progressively distally. Palm longer than wide, subovate in section, nearly straight, with a pointed fixed finger spooned, with some irregular teeth proximally.

**Discussion.** The general form and morphology of the elements of the right cheliped (carpus, propodus, and movable finger) and of the left cheliped (propodus) allow to assert that the studied specimens belong to the Paguridae Latreille, 1802, and to *Anapagurus* Henderson, 1886, having, as reported by McLaughlin (2003: 120), the chelipeds grossly unequal, with right much larger.

*Anapagurus* Henderson, 1886, ranges from the Late Eocene (Priabonian) of Hungary (Müller & Collins, 1991: 54) to the Recent. The extant *A. laevis* (Bell, 1845), type species of the genus, is the only species known to date and also occurs in the Pliocene of the western Scheldt, Dutch territory (The Netherlands) (Fraaije *et al.*, 2007: 38, Tab. 1).

The Miocene species *A. miocenicus* Müller, 1979 (Müller, 1979: 274, 277-278, 286, Pl. 6, figs. 2-5) and *A. marginatus* Müller, 1979 (Müller, 1979: 274, 278, 286-287, Pl. 4, figs. 1-3)) differ from *A. mamertinus* n. sp. in that the lower margin of the propodus is slightly curved, with a very fine tuberculated ridge on the outer side and a proximal prolonged tooth on the upper part of the palm.

The right propodus reported by Garassino & De Angeli (2004: 37, Text-fig. 3) as *Anapagurus* sp., from the Pleistocene of Arda River differs from *A. mamertinus* n. sp. for the lower outline and shape of the index. The Pliocene and extant species *A. laevis* differs also from *A. mamertinus* n. sp. for the general morphology of the outline of propodus, with a lower margin less curved distally.

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