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Tetraliidae and Trapeziidae (Crustacea, Decapoda, Brachyura) from the Early Eocene of Monte Magrè (Vicenza, NE Italy)

Abstract - The decapod crustaceans of the families Tetraliidae and Trapeziidae from the Early Eocene (middle-late Ypresian) of Monte Magrè (Schio, Vicenza, NE Italy), are described. The specimens are assigned to *Eurotetralia loerenthey* (Müller, 1975) n. gen., *Tetralia vicetina* n. sp. (Tetraliidae Castro, Ng & Ahyong, 2004); *Archaeotetra lessinea* n. sp., *Eomaldivia trispinosa* Müller & Collins, 1991, *Paratetralia convexa* Beschin, Busulini, De Angeli & Tessier, 2007, and *Paratetralia sulcata* n. sp. (Trapeziidae Miers, 1886).

The specimens were discovered associated with other decapods, in the coral-rich limestone. This report is the oldest fossil record of both two families. The stratigraphical distribution of the Tetraliidae and Trapeziidae is extended back to the middle-late Ypresian.

Key words: Crustacea, Brachyura, Trapezioidea, Early Eocene, NE Italy.

Riassunto - Tetraliidae e Trapeziidae (Crustacea, Decapoda, Brachyura) dell'Eocene inferiore di Monte Magrè (Vicenza, Italia settentrionale).

Vengono descritti i crostacei decapodi delle famiglie Tetraliidae e Trapeziidae dell'Eocene inferiore (Ypresiano medio-superiore) di Monte Magrè (Schio, Vicenza, Italia settentrionale). Gli esemplari sono assegnati a *Eurotetralia loerenthey* (Müller, 1975) gen. nov., *Tetralia vicetina* sp. nov., (Tetraliidae Castro, Ng & Ahyong, 2004); *Archaeotetra lessinea* sp. nov., *Eomaldivia trispinosa* Müller & Collins, 1991, *Paratetralia convexa* Beschin, Busulini, De Angeli & Tessier, 2007 e *Paratetralia sulcata* sp. nov. (Trapeziidae Miers, 1886).

Gli esemplari sono stati rinvenuti associati ad altri decapodi in calcari ricchi di coralli. Questo ritrovamento è il più antico e cospicuo per il record fossile di queste due famiglie. La distribuzione stratigrafica dei Tetraliidae e Trapeziidae viene estesa all'Ypresiano medio-superiore.

Parola chiave: Crustacea, Brachyura, Trapezioidea, Eocene inferiore, Italia settentrionale.

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Introduction and geological setting

The Tertiary formations from the Veneto region are composed of well-stratified sediments, sometimes with volcanic-tectonic beds, deposited in marine shallow warm environments. The presence in these rocks of a rich decapod community has allowed carrying on geological and paleontological studies by Italian and foreign authors. The first systematic catalogue of the fossil species of decapods from the Eocene and Oligocene of the Vicenza area was proposed by Fabiani (1910). The catalogue was recently updated by De Angeli & Beschin (2001) and De Angeli & Garassino (2006). Recent studies have allowed descriptions of many decapod crustaceans of the coral-reef environments (Beschin *et al*., 2007; De Angeli & Garassino, 2002; De Angeli & Beschin, 2008; De Angeli *et al*., 2010). Based on these studies, the subject of this study is to describe some decapod crustaceans typical of coral-reef environments from the Early Eocene of Monte Magrè (Vicenza). The sample was discovered in Monte Magrè, located on the eastern margin of Lessini Mounts, between Monte di Malo and Schio (Vicenza) (Fig. 1). Fabiani (1915, 1920), Beccaro (2003), and De Angeli & Ceccon (2012) studied the stratigraphy of this area.

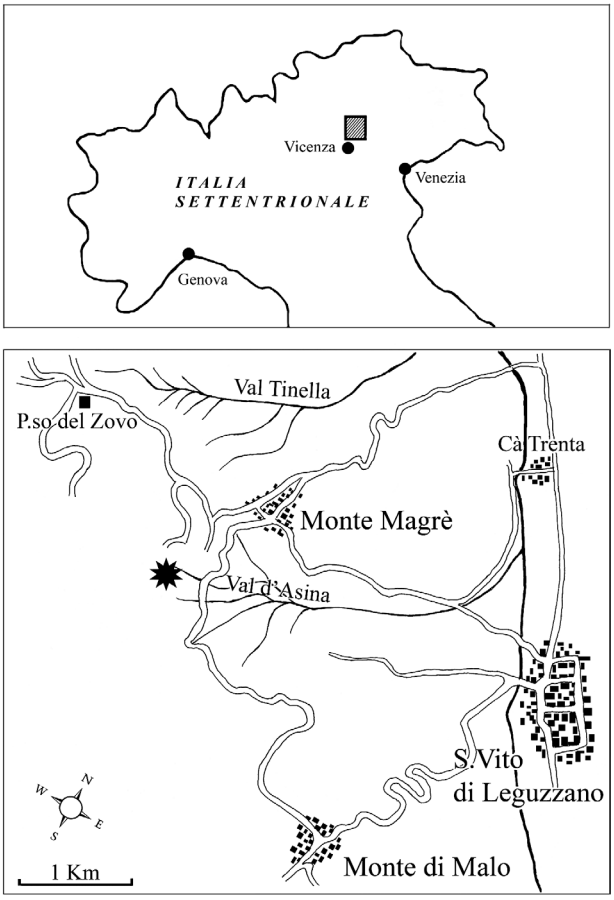


Fig. 1 - Location of the fossil-bearing locality of Monte Magrè (✷) / Ubicazione della località fossilifera di Monte Magrè (✷).

The formation of "Calcari di Spilecco" is located above the Cretaceous Scaglia Rossa, well exposed in Val Tinella, NE of Contrà Casarotti, between Passo del Zovo and Monte Magrè. It is represented by limestones containing planctonic foraminifers, micritic clasts, fragments of discociclins, red algae, crinoids, brachiopods, and nummulites, early Ypresian in age (already identified by Fabiani, 1920).

Above the "Calcari di Spilecco", basalts, basaltic tuffs, and about ten metres of micritic limestones are present and are well exposed between Monte Magrè and Monte di Malo. This calcareous formation contains abundant nullipores, reef algae, fragments of molluscs, echinoids, and decapods of the middle-late Ypresian. Above the nullipore limestones, alveoline and nummulite limestones are present from the middle Eocene, and tuffs with lignite layers from the middle Eocene (Bartonian) (Beccaro, 2003). The decapod crustaceans, subject of this study, were discovered in the Ypresian micritic limestones.

Material

The material includes 23 samples of decapod crustaceans, deposited in the Museo Civico "D. Dal Lago" of Valdagno (Vicenza) (MCV); Inventario Generale dello Stato (I.G.). The sizes are expressed in millimetres. Abbreviations: Lc: maximum length of the carapace; Wc: maximum width of the carapace; Wo-f: width of the orbito-frontal margin; Wf: width of the front; Wp: width of the posterior margin.

For higher-level classification, we follow the recent arrangement proposed by Schweitzer *et al*. (2010).

Systematic Paleontology

Order Decapoda Latreille, 1802
Infraorder Brachyura Latreille, 1802
Section Eubrachyura de Saint Laurent, 1980
Subsection Heterotremata Guinot, 1977
Superfamily Trapezioidea Miers, 1886

Discussion. Castro (1997, 2009), Castro *et al*. (2004), Schweitzer (2005), Karasawa & Schweitzer (2006), and Lai *et al*. (2009) discussed the systematics and phylogeny of the superfamily Trapezioidea (Domeciidae Ortmann, 1893, Tetraliidae Castro, Ng & Ahyong, 2004, and Trapeziidae Miers, 1886). The members of the superfamily are known to be symbionts on corals (*Pocillopora*, *Acropora* and *Stylophora*) in tropical, shallow environments. However, these members are very rare in the fossil records. Indeed, in the recent check list of the fossil genera and species proposed by Schweitzer *et al*. (2010), the family Tetraliidae includes only one fossil species, *Tetralia loerenthey* (Müller, 1975), (Late Eocene, Hungary; Early Oligocene, Italy); the family Trapeziidae Miers, 1886, contains *Archaeotetra inornata* Schweitzer, 2005 (Eocene, Mexico); *Eomaldivia pannonica* Müller & Collins, 1991 and *E. trispinosa* Müller & Collins, 1991 (Late Eocene, Hungary); *Paratetralia convexa* Beschin, Busulini,

De Angeli & Tessier, 2007 (Early Eocene, Italy); *Trapezia brevispinosa* Karasawa, 1993, and *Trapezia* sp. (Miocene, Japan); *T. glaessneri* Müller, 1975 (Miocene, Hungary); *T. prisca* Portell & Collins, 2004 (Miocene, Jamaica), and *T. digitalis* Latreille, 1828, an extant species reported from the Pleistocene of Ryukyu Islands (Japan); the family Domeciidae Ortmann, 1893, contains *Jonesius oligocenicus* (Beschin, De Angeli & Checchi, 2001) (Early Oligocene, Italy); *J. planus* (Müller, 1996) (Middle Miocene, Poland); *Palmyria palmyrensis* (Rathbun, 1923) (Pleistocene, Japan) (Müller, 1975, 1996; Müller & Collins, 1991; Karasawa, 1993, 2000; Portell & Collins, 2004; Schweitzer, 2005; Beschin *et al*., 2001, 2007).

Family Tetraliidae Castro, Ng & Ahyong, 2004
Genus *Eurotetralia* n. gen.

Diagnosis: Oval carapace, almost flat, as wide as long; orbito-frontal margin slightly shorter than maximum width of carapace (Wo-f / Wc = 0.97); front wide (Wf / Wc = 0.64), convex, indented; semicircular orbits positioned on angle of anterior border of carapace, directed anterolaterally; supraorbital margin weakly rimmed, most deeply excavated axially; anterolateral margins short, almost straight, parallel, with two acute teeth; posterolateral margins long, convergent almost concave in terminal part; posterior margin narrow (Wp / Wc = 0.42), straight; dorsal surface smooth, regions not defined.

Type species: *Trapezia loerenthey* Müller, 1975.

Etymology: the name alludes to Europe, the continent where the specimens were discovered, and *Tetralia* Dana, 1851, sharing the most affinities with the new genus (Gender feminine).

Discussion. Müller (1975) erected *Trapezia loerenthey* (=?*Hepatiscus laevis in* Lőrenthey & Beurlen, 1929) based on two poorly preserved carapaces from the late Eocene (Priabonian) of Budapest (Hungary). Later Müller & Collins (1991) examined type and new specimens and moved it to *Tetralia*. Indeed, the authors pointed out that a convex front with small teeth of the Hungarian species was typical of *Tetralia*. The anterolateral margin of the species, however, has two acute teeth, usually absent in the extant ones. Only a small tooth is present in the juvenile specimens of *Tetralia glaberrima* (Herbst, 1790) and *T. cinctipes* Paul'son, 1875, progressively reduced during the growth (Sakai, 1976; Galil, 1986).

The diagnoses of the fossil and extant genera of the Trapeziidae known to date were given by Castro *et al*. (2004). *Tetralia* Dana, 1851, and *Tetraloides* Galil, 1986, are defined by a nearly straight or slightly convex front with small teeth and smooth anterolateral margins in the adults. As reported by Müller & Collins (1991), the front of the Hungarian species is typical of *Tetralia*, but the anterolateral margins with two well-developed teeth distinguish this species from the others known species. The Hungarian species differs also from *Trapezia* Latreille, 1828, that has the front with short, round, lobes, and smooth anterolateral margins or provided with a short tooth. The two-three anterolateral teeth are present in *Eomaldivia* Müller & Collins, 1991, but it differs from *Eurotetralia* n. gen. by having a smooth front that is weakly engraved in the median part.

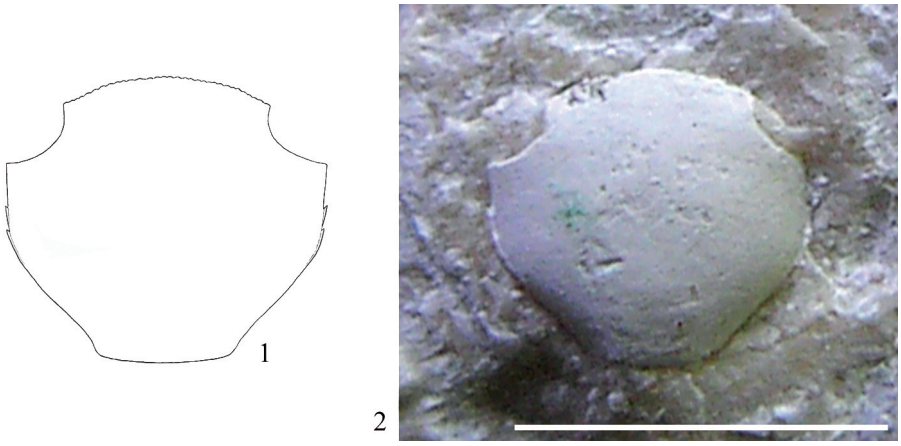


Fig. 2 - *Eurotetralia loerenthey* (Müller, 1975), **1**) carapace reconstruction / ricostruzione del carapace; **2**) MCV 12/10-I.G.360316, dorsal view / visione dorsale. Scale bar / Scala metrica = 5 mm.

Eurotetralia loerenthey (Müller, 1975) n. comb.
Fig. 2 (1, 2)

Trapezia loerenthey Müller, 1975: 516, 520, pl. 1, fig. 1.
Tetralia loerenthey (Müller) - Müller & Collins, 1991: 82, fig. 4, pl. 6, figs. 9, 12, 15. - De Angeli *et al.*, 2010: 164, fig. 11. - Schweitzer *et. al*., 2010: 123.

Locality: Monte Magré (Vicenza).
Geological age: Early Eocene (middle-late Ypresian).
Material and measurements: one specimen with well-preserved carapace (MCV 12/10-I.G.360316 - Lc: 3.3; Wc: 3.4; Wo-f: 3.4; Wf: 2.2; Wp: 1.4).
Discussion. The specimen from Monte Magrè shows the shape and characters of *Eurotetralia loerenthey* (Müller, 1975). One incomplete carapace was reported from the Early Oligocene of Bernuffi (Montecchio Maggiore, Vicenza) (De Angeli *et al*., 2010). The specimen has a weak ridge on margins behind the anterolateral teeth. This ridge is also present in the Hungarian specimens illustrated by Müller & Collins (1991: pl. 6, fig. 9). The discovery of *E. loerenthey* in the sediments of Monte Magrè extends the stratigraphic range of this species back to middle-late Ypresian.

Genus *Tetralia* Dana, 1851

Type species: *Cancer glaberrimus* Herbst, 1790, by monotypy.
Fossil species: *Tetralia vicentina* n. sp.

Tetralia vicetina n. sp.
Fig. 3 (1-3)

Diagnosis: Carapace oval, flat, wider than long; front wide, convex, with continuous, and slightly indented margin; orbits semicircular, positioned on edges of

anterior border of carapace, directed anterolaterally, most deeply excavated axially, weakly rimmed; anterolateral margins divergent, toothless; posterolateral margins long, sinuous; dorsal regions not defined with smooth surface; some pits on the anterior part of carapace.

Etymology: from the latin *Vicetia* = Vicenza, province where the specimens were discovered.

Holotype: MCV 12/01-I.G.360307.

Paratypes: MCV 12/02-I.G.360308, MCV 12/03-I.G.360309, MCV 12/04-I.G.360310.

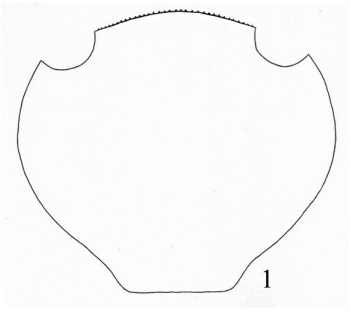
Type locality: Monte Magrè (Schio, Vicenza).

Geological age: Early Eocene (middle-late Ypresian).

Material and measurements: four specimens with well-preserved carapace (MCV 12/01-I.G.360307, MCV 12/02-I.G.360308, MCV 12/03-I.G.360309, MCV 12/04-I.G.360310).

MCV 12/01-I.G.360307 - Lc: 7.6; Wc: 8.5; Wo-f: 7.1; Wf: 3.9; Wp: 3;0

MCV 12/02-I.G.360308 - Lc: 5.0; Wf: 2.8; Wp: 1.7



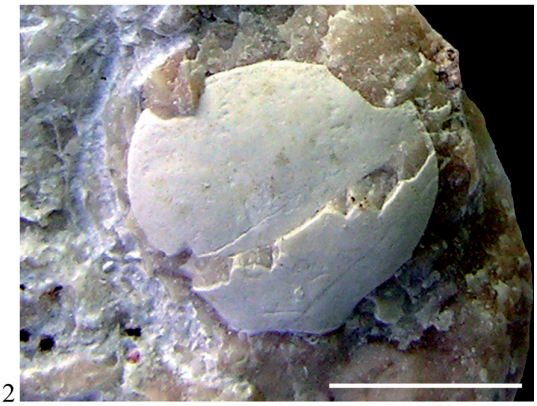


Fig. 3 - *Tetralia vicetina* n. sp., **1**) carapace reconstruction / ricostruzione del carapace; **2**) MCV 12/01-I.G.360307, holotype, dorsal view / olotipo, visione dorsale; **3**) MCV 12/02-I.G.360308, paratype, dorsal view / paratipo, visione dorsale. Scale bar / Scala metrica = 5 mm.

MCV 12/03-I.G.360309 - Lc: 6.5; Wc: 7.5; Wo-f: 6.5; Wf: 3.7; Wp: 2.4
MCV 12/04-I.G.360310 - Lc: 3.3; Wc: 3.7; Wo-f: 3.0; Wf: 1.6; Wp: 1.3

Description. Carapace oval, flat, wider than long (Lc / Wc = 0.89), widest on mid-length; orbito-frontal margin well developed, wide (Wo-f / Wc = 0.83); front wide (Wf / Wc = 0.45), convex, with continuous, slightly indented margin; orbits semicircular, positioned on edges of anterior border of carapace, directed anterolaterally, most deeply excavated axially, weakly rimmed; anterolateral margins divergent, toothless; posterolateral margins not distinct from anterolateral margins; posterior margin narrow (Wp / Wc = 0.35), straight; dorsal surface smooth without regions; some pits on anterior part of carapace.

Discussion. *Tetralia vicetina* n. sp. differs from *Eurotetralia loerenthey* (Müller, 1975) having an indistinct junction between the anterolateral and posterolateral margins (not equal and wider carapace in *Eurotetralia*) and lacking anterolateral margins (two anterolateral teeth in *Eurotetralia*). *Tetralia vicetina* n. sp. shows the typical carapace shape of *Tetralia*. *Tetralia vicetina* n. sp. represents the first fossil species assigned to this genus.

Family Trapeziidae Miers, 1886
Subfamily Trapeziinae Miers, 1886
Genus *Archaeotetra* Schweitzer, 2005

Type species: *Archaeotetra inornata* Schweitzer, 2005, by original designation.
Fossil species: *Archaeotetra inornata* Schweitzer, 2005; *A. lessinea* n. sp.

Archaeotetra lessinea n. sp.
Fig. 4 (1-5)

Diagnosis: Carapace slightly convex, wider than long, widest on the median part of carapace; regions smooth, not defined; orbito-frontal margin wide, about 0.94% of the maximum carapace width; front wide, very weakly biconvex, with a shallow median notch; semicircular orbits positioned at edges of anterior border of carapace, directed anterolaterally, most deeply excavated axially, very weakly rimmed; anterolateral margin very short, convex, marked by a thickened rim; posterolateral margin long, initially weakly convex, oblique, rectilinear; posterior margin straight, about one-third maximum carapace width; dorsal surface with small pits and ripples along the anterolateral margins.

Etymology: the trivial name alludes to Monti Lessini where the specimens were discovered.

Holotype: MCV 12/05-I.G.360311.

Paratypes: MCV 12/06-I.G.360312, MCV 12/07-I.G.360313, MCV 12/08-I.G.360314, MCV 12/09-I.G.360315.

Type locality: Monte Magrè (Schio, Vicenza).

Geological age: Early Eocene (middle-late Ypresian).

Material and measurements: five specimens with well-preserved carapace (MCV 12/05-I.G.360311, MCV 12/06-I.G.360312, MCV 12/07-I.G.360313, MCV 12/08-I.G.360314, MCV 12/09-I.G.360315).

MCV 12/05-I.G.360311 - Lc: 6.3; Wc: 8.5; Wo-f: 8.0; Wf: 5.2; Wp: 2.8
MCV 12/06-I.G.360312 - Wc: 5.7

MCV 12/07-I.G.360313 - Lc: 4.7; Wf: 3.6; Wp: 2.5
MCV 12/08-I.G.360314 - Lc: 4.1; Wc: 5.5; Wo-f: 5.2; Wf: 3.4; Wp: 1.9
MCV 12/09-I.G.360315 - incomplete carapace.

Description. Carapace slightly convex superficially, wider than long (Lc / Wc = 0.74), widest on the median part of carapace; orbito-frontal margin well developed, wide (Wo-f /Wc = 0.94); front wide (Wf / Wc = 0.61), weakly biconvex, with a shallow median notch; orbits semicircular, positioned at edges of anterior

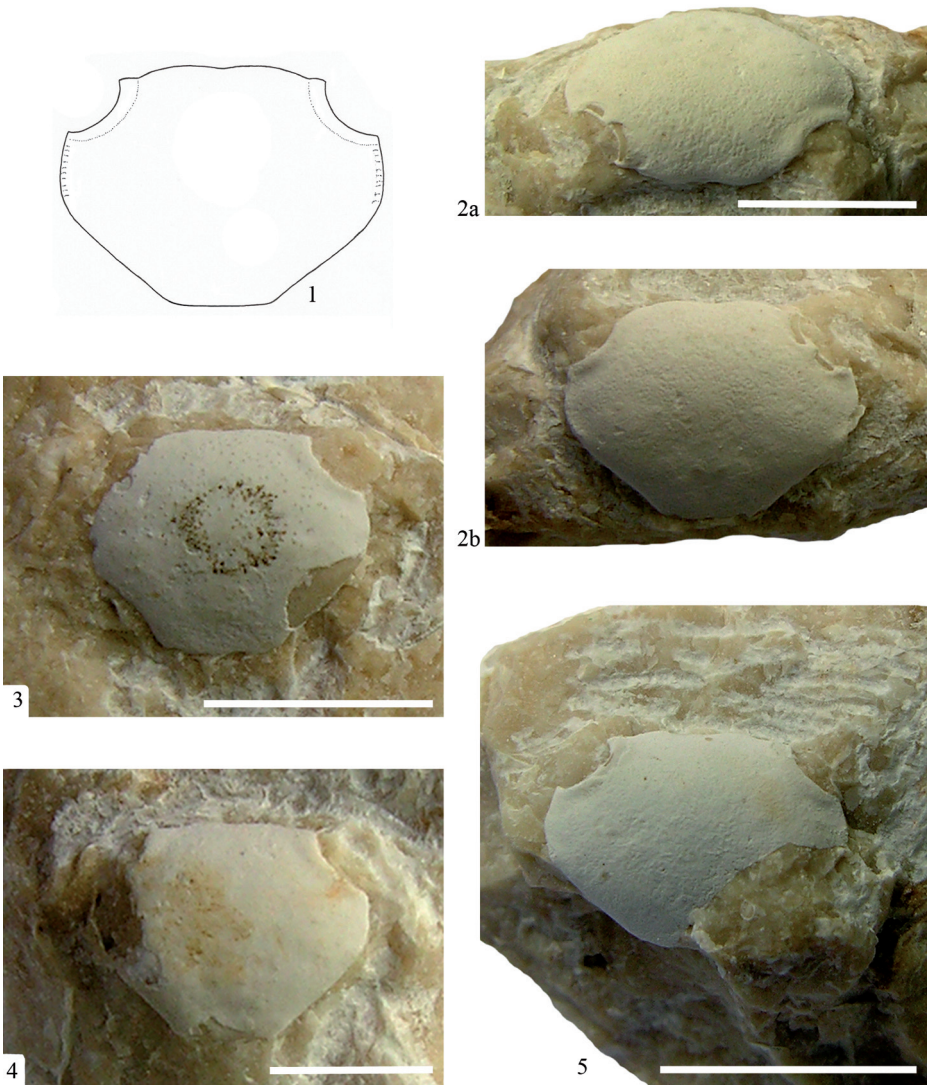


Fig. 4 - *Archaeotetra lessinea* n. sp., **1**) carapace reconstruction / ricostruzione del carapace; **2**) MCV 12/05-I.G.360311, holotype, a = frontal view, b = dorsal view / olotipo, a = visione frontale, b = visione dorsale; **3**) MCV 12/07-I.G.360313, paratype, dorsal view / paratipo, visione dorsale; **4**) MCV 12/06-I.G.360312, paratype, dorsal view / paratipo, visione dorsale; **5**) MCV 12/08-I.G.360314, paratype, dorsal view / paratipo, visione dorsale. Scale bar / Scala metrica = 5 mm.

border of carapace, directed anterolaterally, most deeply excavated axially, very weakly rimmed; anterolateral margins very short, smooth, toothless, marked by a thickened rim; posterolateral margin long, initially weakly convex, oblique, rectilinear; posterior margin short (Wp / Wc = 0.33), straight; regions not distinct; dorsal surface smooth; dorsal surface with small pits and ripples along anterolateral margins.

Discussion. The specimens show the morphological characters of *Archaeotetra* Schweitzer, 2005, with the sole species *A. inornata* Schweitzer, 2005, from the Eocene of Mexico (Baja California Sur). *Archaeotetra lessinea* n. sp. differs from the type species by exhibiting a wider carapace, a wide front, more developed orbits, and the dorsal surface with small pits and ripples along the anterolateral margins.

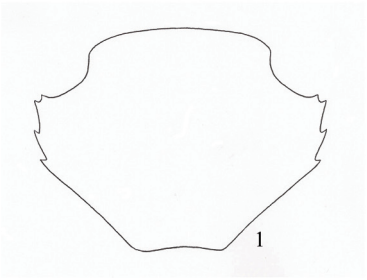
Genus *Eomaldivia* Müller & Collins, 1991

Type species: *Eomaldivia pannonica* Müller & Collins, 1991, by original designation.
Fossil species: *Eomaldivia pannonica* Müller & Collins, 1991; *E. trispinosa* Müller & Collins, 1991.

Eomaldivia trispinosa Müller & Collins, 1991
Fig. 5 (1-4)

Eomaldivia trispinosa Müller & Collins, 1991: 81, fig. 41, pl. 6, figs. 8, 11.
Eomaldivia trispinosa Müller & Collins, 1991 - Schweitzer *et al*., 2010: 123.

Type locality: Monte Magrè (Schio, Vicenza).
Geological age: Early Eocene (middle-late Ypresian).
Material and measurements: four specimens with well-preserved carapace (MCV 12/11-I.G.360317, MCV 12/12-I.G.360318, MCV 12/13-I.G.360319, MCV 12/14-I.G.360320).
MCV 12/11-I.G.360317 - Lc: 3.8; Wc: 5.0; Wo-f: 4.7; Wf: 3.2; Wp: 1.6
MCV 12/12-I.G.360318 - Lc: 4.1; Wc: 5.3; Wo-f: 4.9; Wf: 3.2; Wp: 1.8
MCV 12/13-I.G.360319 - Lc: 3.7; Wc: 4.9; Wo-f: 4.5; Wf: 2.8; Wp: 1.7
MCV 12/14-I.G.360320 - Lc: 3.5; Wc: 4.5; Wo-f: 4.1; Wf: 2.6; Wp: 1.4
Description. Carapace oval, flat, wider than long (Lc / Wc = 0.76); orbito-frontal margin very wide (Wo-f / Wc = 0.92); front wide (Wf / Wc = 0.60), smooth, convex, weakly engraved medially, without indentation; orbits semicircular, positioned at edges of anterior border of carapace, directed anterolaterally, deeply excavated axially, weakly rimmed; anterolateral margins slightly convex, with three teeth (the first very close to the small postorbital tooth); posterior margin very narrow (Wp / Wc = 0.33), slightly concave; regions not distinct; dorsal surface smooth.
Discussion. The specimens exhibit the diagnostic characters of *Eomaldivia trispinosa* Müller & Collins, 1991, from the late Eocene of Hungary. This is the first report of the species from the Eocene of Italy.



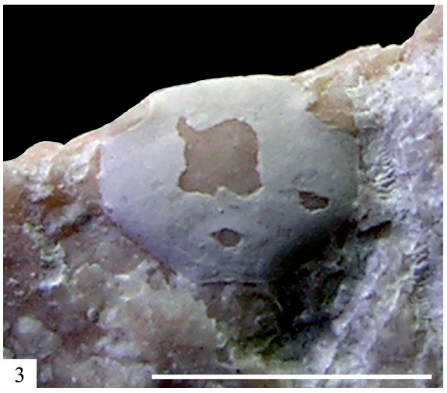


Fig. 5 - *Eomaldivia trispinosa* Müller & Collins, 1991, **1**) carapace reconstruction / ricostruzione del carapace; **2**) MCV 12/11-I.G.360317, dorsal view / visione dorsale; **3**) MCV 12/14-I.G.360320, dorsal view / visione dorsale; **4**) MCV 12/12-I.G.360318, dorsal view / visione dorsale. Scale bar / Scala metrica = 5 mm.

Genus *Paratetralia* Beschin, Busulini, De Angeli & Tessier, 2007

Type species: *Paratetralia convexa* Beschin, Busulini, De Angeli & Tessier, 2007, by original designation.

Fossil species: *Paratetralia convexa* Beschin, Busulini, De Angeli & Tessier, 2007; *P. sulcata* n. sp.

Paratetralia convexa Beschin, Busulini, De Angeli & Tessier, 2007
Fig. 6 (1-4)

Paratetralia convexa Beschin, Busulini, De Angeli & Tessier, 2007: 55, pl. 8, figs. 6-8.

Paratetralia convexa Beschin, Busulini, De Angeli & Tessier, 2007 - Schweitzer *et al*., 2010: 123.

Type locality: Monte Magrè (Schio, Vicenza).

Geological age: Early Eocene (middle-late Ypresian).

Material and measurements: eight specimens with well-preserved carapace (MCV 12/15-I.G.360321, MCV 12/16-I.G.360322, MCV 12/17-I.G.380323, MCV 12/18-I.G.360324, MCV 12/19-I.G.360325, MCV 12/20-I.G.360326, MCV 12/21-I.G.360327, MCV 12/22-I.G.360328).

MCV 12/15-I.G.360321 - Lc: 6.6; Wc: 9.3; Wo-f: 8.6; Wf: 6.3; Wp: 2.3
MCV 12/16-I.G.360322 - Lc: 8; Wc: 11.3; Wo-f: 10.4; Wf: 7.7; Wp: 2.7
MCV 12/17-I.G.380323 - Lc: 5.4; Wc: 7.3; Wo-f: 6,.7; Wf: 4.9; Wp: 1.9
MCV 12/18-I.G.360324 - Lc: 7.1; Wc: 10; Wo-f: 9.3; Wf: 6.8; Wp: 2.6
MCV 12/19-I.G.360325 - Lc: 9.2; Wc: 13; Wo-f: 12; Wf: 8.8; Wp: 3.5

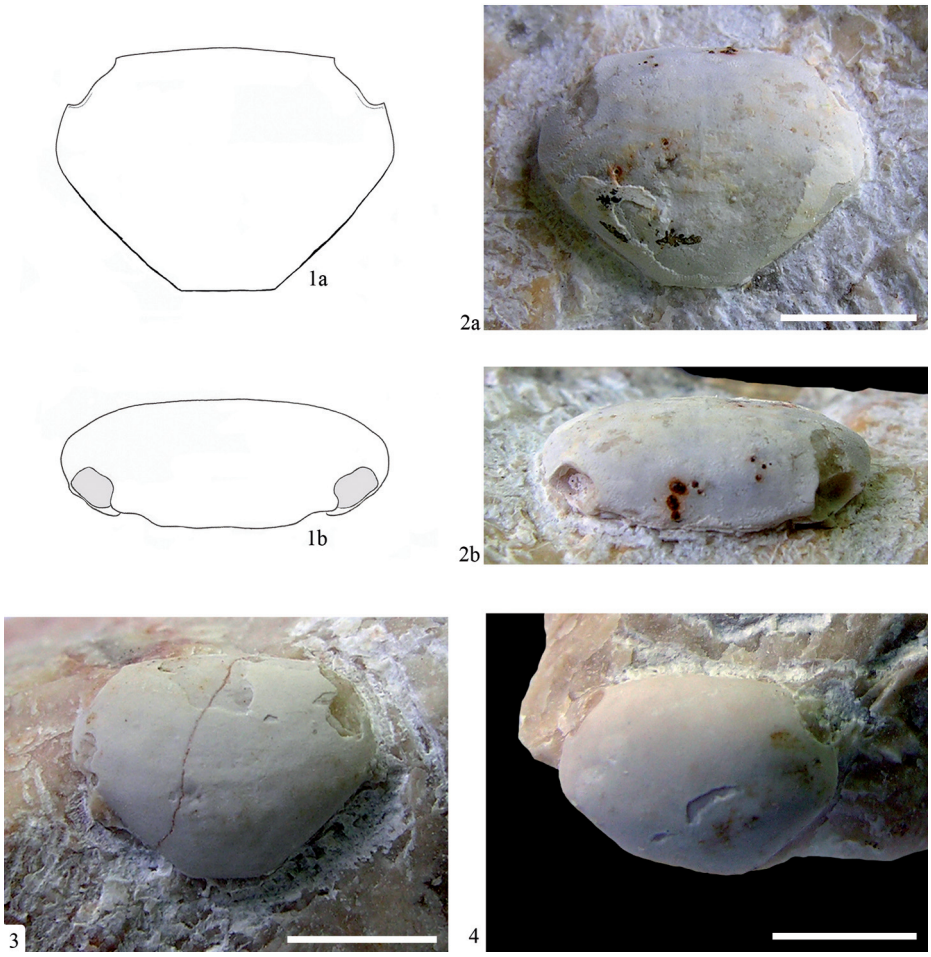


Fig. 6 - *Paratetralia convexa* Beschin, Busulini, De Angeli & Tessier, 2007, **1**) carapace reconstruction, a = dorsal view, b = frontal view / ricostruzione del carapace, a = visione dorsale, b = visione frontale; **2**) MCV 12/20-I.G.360326, a = dorsal view, b = frontal view / a = visione frontale, b = visione dorsale; **3**) MCV 12/21-360327, dorsal view / visione dorsale; **4**) MCV 12/22-I.G.360328, dorsal view / visione dorsale. Scale bar / Scala metrica = 5 mm.

MCV 12/20-I.G.360326 - Lc: 9.2; Wc: 12.9; Wo-f: 11.9; Wf: 8.4; Wp: 3.2
MCV 12/21-I.G.360327 - Lc: 7.5; Wc: 10.2; Wo-f: 9.4; Wf: 6.6; Wp: 2.7
MCV 12/22-I.G.360328 - Lc: 7; Wc: 9.7; Wo-f: 9.1; Wf: 6.2

Diagnosis: Carapace wider than long, longitudinally convex above all in the anterior part; orbito-frontal margin very wide, inclined laterally; dorsal frontal region convex, continuous; frontal margin with slightly shallow notch axially; orbits semicircular, positioned at the edge of anterior border of carapace, directed anterolaterally, not deeply excavated axially; anterolateral margins short, smooth, slightly divergent; posterolateral margins long, strongly converging; posterior margin short; dorsal regions not defined, smooth.

Description. Carapace wider than long (Lc / Wc = 0.71), convex mainly longitudinally; orbito-frontal margin very wide (Wo-f / Wc = 0.92); front wide (Wf / Wc = 0.67), inclined laterally, front sinuous along lateral parts; dorsal frontal region convex, continuous; frontal margin shallowly notched medially; orbits semicircular, positioned at the edge of the anterior border of carapace, directed anterolaterally; supraorbital margins concave, not deeply excavated axially, with a weak median sinuosity; infraorbital margin concave, continuous, with a narrow antennal fissure; anterolateral margins short, smooth, slightly divergent; posterolateral margins long, almost straight, strongly convergent; posterior margin narrow (Wp / Wc = 0.26), almost straight; regions not distinct; dorsal surface smooth.

Discussion. *Paratetralia convexa* was described based on 46 specimens from the Early Eocene (Ypresian) of Contrada Gecchelina of Monte di Malo (Vicenza) (Beschin *et al*., 2007). The original description of this species is based on the study of the mould of the interior of the carapace. *Paratetralia convexa* is also reported from Monte Magrè.

Paratetralia sulcata n. sp.
Fig. 7 (1, 2)

Diagnosis: Carapace subexagonal, wider than long, longitudinally convex, especially in the anterior part; front very wide, downward-tilted, dorsal frontal region slightly convex, continuous; frontal margin sinuous, weakly notched on median part; orbits semicircular, positioned at edge of the anterior border of carapace, directed anterolaterally, not deeply excavated axially, and superficially ridged; anterolateral margins short, smooth, not much divergent, superficially ridged; posterolateral margins long, strongly converging; posterior margin narrow; regions undefined; cervical groove, two epibranchial grooves, and a groove between cardiac and intestinal regions present; dorsal surface with pits, more developed in anterior part.

Etymology: from the latin *sulcatum -a* = groove, for the transverse grooves on the dorsal surface of the carapace.

Holotype: MCV 12/23-I.G.360329.

Type locality: Monte Magrè (Schio, Vicenza).

Geological age: Early Eocene (middle-late Ypresian).

Material and measurements: one specimen with well-preserved carapace (MCV 12/23-I.G.360329 - Wc: 14.4; Lc: 10.2; Wo-f: 13.7; Wf: 10.2; Wp: 4.2).

Description. Carapace subexagonal, wider than long (Lc / Wc = 0.70), convex longitudinally mainly in anterior part; orbito-frontal margin very wide (Wo-f / Wc = 0.95); front wide (Wf / Wc = 0.70), downward-inclined; dorsal frontal region slightly convex, continuous; frontal margin sinuous, weakly engraved on the median part; orbits semicircular, positioned at edge of anterior border of carapace, directed anterolaterally, not deeply excavated axially, with a median sinus; supraorbital margin superficially ridged; suborbital margin concave, continuous, with a narrow antennal fissure; anterolateral margins short, smooth, ridged slightly divergent; posterolateral margins long, strongly convergent; posterior margin narrow (Wp / Wc = 0.29), straight; regions not distinct; cervical groove well marked, with three pair of pits corresponding to gastric muscle attachments; two grooves in epibranchial region and one groove dividing cardiac region from intestinal region; dorsal surface with pits, more developed in frontal region and supraorbital areas.

Discussion. Although the specimen has size and shape like these of *Paratetralia convexa*, it differs in having the ridged supraorbital and anterolateral margins; the dorsal surface of the carapace with three weak grooves [Fig. 7 (1, 2b)]; the pitted dorsal surface; more developed frontal region and supraorbital areas [Fig. 7 (2a)]. These characters are not present in *Paratetralia convexa*.

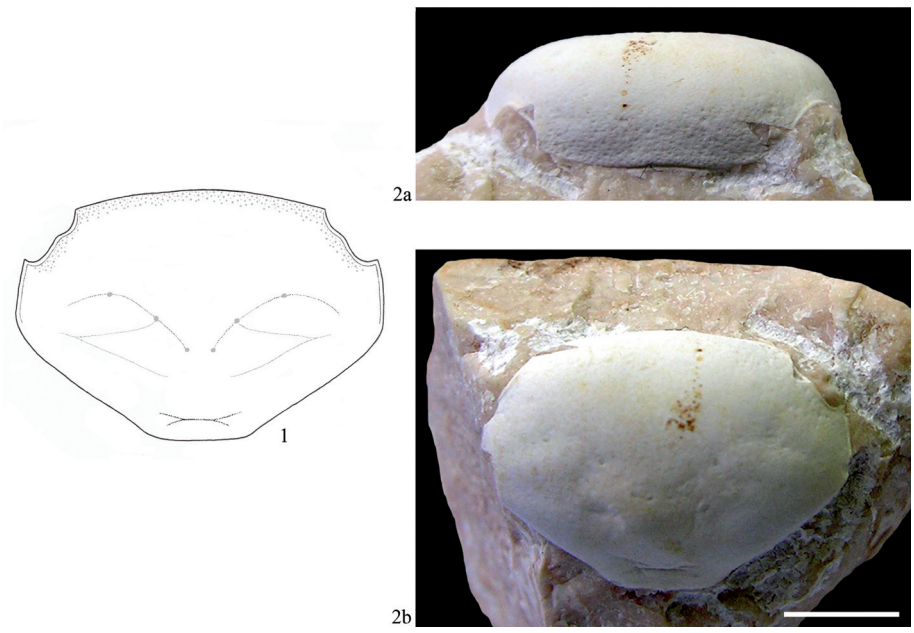


Fig. 7 - *Paratetralia sulcata* n. sp., **1**) carapace reconstruction / ricostruzione del carapace; **2**) MCV 12/23-I.G.360329, holotype, a = frontal view, b = dorsal view / olotipo, a = visione frontale, b = visione dorsale. Scale bar / Scala metrica = 5 mm.

Conclusions

The two families, Tetraliidae and Trapeziidae, include small crabs, living in symbiosis with some corals (*Pocillopora*, *Acropora* e *Stylophora*) (Schweitzer, 2005). These crabs are widespread in tropical Indo-Pacific oceans and the extant species are identifiable by showy colour of the body. The knowledge of these fossil crabs is scarce because of the small-sized of the body and the preservation, usually inside hard coral-reef rocks.

The discovery of six species from Monte Magrè, associated with other decapods (see Beschin *et al*., 2007, for a complete check list) in the coral-reef environment, is very important because these occurences represent the oldest species known to date in the fossil record.

Additionally, the discovery of six trapezid species from the Early Eocene of Monte Magrè is unusual for the fossil record and, as already point out by some authors (Fabiani, 1910; Beschin *et al*., 1988), it documents the relationships between the Eocene decapods from the venetian region and the extant community of the Indo-Pacific areas.

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