



# A new homolid crab, *Cherpihomola italica* gen. nov., sp. nov. (Decapoda, Brachyura), from the Rupelian of the Ligure-Piemontese Basin (Alessandria, northern Italy)

## Nov homolidni rak *Cherpihomola italica* gen. nov., sp. nov. (Decapoda, Brachyura) iz spodnjeoligocenskih (rupelijskih) plasti Ligursko-piemontskega bazena (Alessandria, severna Italija)

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*Ključne besede:* Homolidae, spodnji oligocen, južna Evropa, nova vrsta

### Abstract

A new genus and species of homolid from lower Oligocene (Rupelian) strata in the Ligure-Piemontese Basin (northern Italy) is introduced. *Cherpihomola italica* gen. nov., sp. nov. represents the first record of homolids from Oligocene deposits across Europe and extends the palaeogeographical distribution of extinct homolids.

### Izvleček

V prispevku predstavljamo nov rod in novo vrsto homolidnih rakov iz spodnjeoligocenskih (rupelijskih) plasti v Ligursko-piemontskem bazenu (severna Italija). *Cherpihomola italica* gen. nov., sp. nov. je prva najdba homolidnih desetonožcev iz oligocenskih nahajališč v Evropi, kar nam omogoča boljše poznavanje paleogeografske razširjenosti te skupine fosilne rakov.

### Introduction

Studies of decapod crustaceans of the Ligure Piemontese Basin started with Sismonda (1846, 1861), who recorded brachyurans of Miocene age from the Turin hills. Later, Michelotti (1861) and Crema (1895) added material from Miocene and Pliocene deposits in the same area, while Ristori (1889) described new species from the Rupelian of Sassello, Santa Giustina, Fornaci and Dego. Recently, Allasinaz (1987), Marangon & De Angeli (1997, 2007), De Angeli & Marangon (2001, 2003a, b), Larghi (2003), Busulini et al. (2014), Pasini & Garassinio (2017a, b) and Pasini et al. (2019) described a number of new species from this area.

The carcinological fauna includes the following species: *Hoploparia* sp., *Callianassa canavarii* Ristori, 1889, *Callianassa* sp., *Pagurus* sp., *Zygopa galantensis* (De Angeli & Marangon, 2001), *Alcespina ovadaensis* Pasini & Garassinio, 2017 [= *Ranina (Ranina) speciosa*, sensu Allasinaz, 1987], *Lophoranina* sp. (= *Lophoranina ?aldrovandi*, sensu Sismonda, 1861), *Calappa demarcoi* Pasini & Garassinio, 2017, *Stenodromia mainii* (Allasinaz, 1987) (as *Calappilia*), *Calappilia verrucosa* A. Milne-Edwards in Bouillé, 1873, *Calappilia vicentina* Fabiani, 1910, *Mursiopsis postulosus* Ristori, 1889, *Cherpiocarcinus rostratus* Marangon & De Angeli, 1997, *Retropluma* sp., *Portunus ristorii* Karasawa, Schweitzer

& Feldmann, 2008 (= *P. convexus* Ristori, 1888), *Coeloma vigil* A. Milne-Edwards, 1865, *Palaeocarpilius aquitanicus* A. Milne-Edwards, 1862 (= *P. macrocheilus*, *sensu* Allasinaz, 1987), *Eriphia* sp. and *Grapsus* sp. To this list, we here add *Cherpihomola italica* n. gen., sp. nov.

### Geological and stratigraphical setting

Lithologically, Rupelian strata in the Ligure Piemontese Basin are characterised by an alternation of greyish marls with nodular elements and silt-rich marls, occasionally sandy, resting on the “Formazione di Pianfolco”, which is of Rupelian age. Macrofossils are preserved mainly within pebbles or nodules that were eroded from the highest levels exposed of this sedimentary complex, which is referred to as “Formazione di Molare”. These levels overlies terrestrial units of the “Brecce di Costa Cravara and Pianfolco”, studied by Charrier et al. (1964) and dated as early Rupelian (see also Gelati & Gnaccolini, 1978; Gnaccolini, 1978). The crab-bearing levels were attributed to the transition between the “Formazione di Molare” and the overlying “Marne di Rigoroso” by Allasinaz (1987) and to the biozone of the benthic foraminifer *Operculina complanata* (Bianco, 1985; Balossino & Bianco, 1986). Other studies on Oligocene deposits in this area were carried out by Franceschetti (1967), Gela-

ti & Gnaccolini (1980) and Fantoni et al. (1983). The palaeoenvironment of the Case Cherpione area documents three Rupelian phases, from a fully terrestrial setting with forests and rivers that transported abundant plant remains (early Rupelian), to a marine, warm-water lagoon with moderate currents and coasts nearby (middle Rupelian) and finally, during the late Rupelian, different platform conditions, a bathymetric change and a different benthos/plankton ratio which led to the disappearance of the macrofauna (Gelati & Gnaccolini, 1980; Fantoni et al., 1983).

The material studied here originates from the top levels of the “Molare Formation” (middle Rupelian) at Case Cherpione (Alessandria, northern Italy); it is preserved in nodules of diagenetic origin (Fig. 1).

### Material and methods

Two specimens from the middle Rupelian of Case Cherpione (Ovada, Alessandria) are housed in the palaeontological collections of the Museo Civico “G. Zannato”, Montecchio Maggiore, Vicenza (abbreviation: MCZ). They are three-dimensionally preserved; preparation was easy because of the unconsolidated matrix. Dimensions are in millimetres. For higher-level classification, we follow the recent arrangement proposed by Guinot et al. (2013).

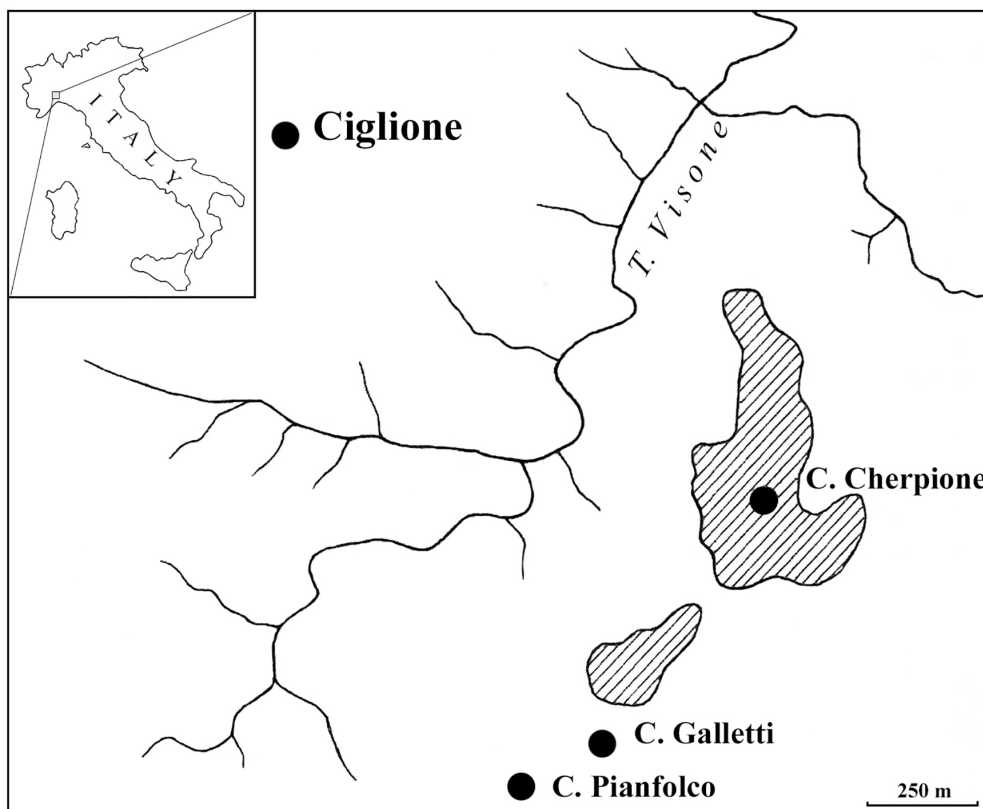


Fig. 1. Outcrops of Rupelian strata in Case Cherpione (Alessandria, northeast Italy).

## Systematic palaeontology

Order Decapoda Latreille, 1802

Infraorder Brachyura Latreille, 1802

Subsection Homoliformia Karasawa, Schweitzer & Feldmann, 2011

Superfamily Homoloidea H. Milne Edwards, 1837

Family Homolidae H. Milne Edwards, 1837

**Discussion:** The superfamily includes the families Homolidae, Poupiniidae Guinot, 1991 and Latreillidae Stimpson, 1858 (Guinot & Richer de Forges, 1995). The typical features of Recent homolids have been outlined in detail by Guinot & Richer de Forges (1995) and Davie et al. (2015), while extinct forms have been discussed by Collins (1997), Schweitzer et al. (2010), Nyborg & Garassino (2017) and Garassino et al. (2015, 2019).

According to several authors (notably Schweitzer et al., 2010; De Angeli & Alberti, 2012; Garassino et al., 2015; Nyborg & Garassino, 2017 and Garassino et al., 2019), eighteen fossil genera (four also with Recent representatives) should be assigned to the Homolidae, as follows: *Cretalamoha* Nyborg & Garassino, 2017, *Dagnaudus* Guinot & Richer de Forges, 1995 (both fossil and Recent), *Doerflesia* Feldmann & Schweitzer, 2009, *Homola* Leach, 1815 (both fossil and Recent), *Homoliformis* Collins, Schulz & Jakobsen, 2005, *Homolopsis* Bell, 1863, *Hoplitocarcinus* Beurlen, 1928, *Latheticocarcinus* Bishop, 1988, *Lignihomola* Collins, 1997, *Lindahomola* Garassino, Weaver, Portell & Vega, 2019, *Londinimola* Collins & Saward, 2006, *Nogarhomola* De Angeli & Alberti, 2012, *Palehomola* Rathbun, 1926, *Paromola* Wood-Mason, in Wood-Mason & Alcock, 1891 (both fossil and Recent), *Paromolopsis* Wood-Mason, in Wood-Mason & Alcock, 1891 (both fossil and Recent), *Peedeehomola* Garassino, Clements & Vega, 2015, *Prohomola* Karasawa, 1992 and *Zygastrocarcinus* Bishop, 1983.

### Genus *Cherpihomola* gen. nov.

**Type species:** *Cherpihomola italica* sp. nov.

**Etymology:** The generic name refers to Case Cherpione, the locality which yielded the type specimens.

**Diagnosis:** Carapace longitudinally square in outline, as long as wide; well-developed *linea homolica*, sinuous in outline, acute rostrum, one pseudorostral spine, one infra-orbital spine, one hepatic spine, one anterolateral spine, two posterolateral spines, regions nearly smooth and slightly raised.

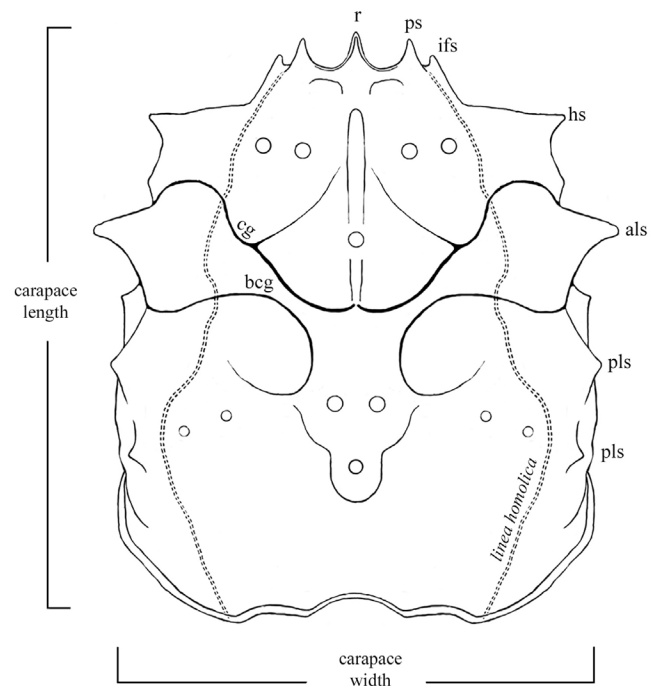


Fig. 2. *Cherpihomola italica* n. gen., n. sp., reconstruction of dorsal carapace (r: rostrum; ps: pseudorostral spine; ifs: infra-orbital spine; hs: subhepatic spine; als: anterolateral spine; pls: posterolateral spine; cg: cervical groove; bcg: branchiocardiac groove).

### *Cherpihomola italica* sp. nov.

Fig. 2; Pl. 1

**Material and measurements:** Two carapaces; the holotype is MCZ 5759 (carapace length 17.5 mm; carapace width 16.4 mm); the paratype is MCZ 5760 (carapace length 20.6 mm).

**Description:** Carapace longitudinally square, as long as wide, well-developed *linea homolica*, sinuous; moderately vaulted transversely, less so longitudinally, lateral sides slanted, nearly subvertical; regions smooth well marked by grooves; triangular rostrum not sulcate axially; one pseudorostral spine, as long as the rostrum; a short infraorbital spine; anterolateral margin with one prominent subhepatic spine directed outwards; a second short spine is present ventrally, not visible in dorsal view; one prominent anterolateral spine directed outwards present between cervical and branchiocardiac grooves; posterolateral margin with two short spines; posterior margin wide, concave and rimmed; deep cervical groove, convex laterally to epibranchial lobe, strongly inclined between inferior margin of mesogastric region; branchiocardiac groove almost straight proximally, downturned posteriorly to gastric lobe, curved and continuous on branchial region; epigastric lobe defined by pair of tubercles positioned just posterior to pseudorostral spines;

## PLATE 1



1a



2



1b



1d



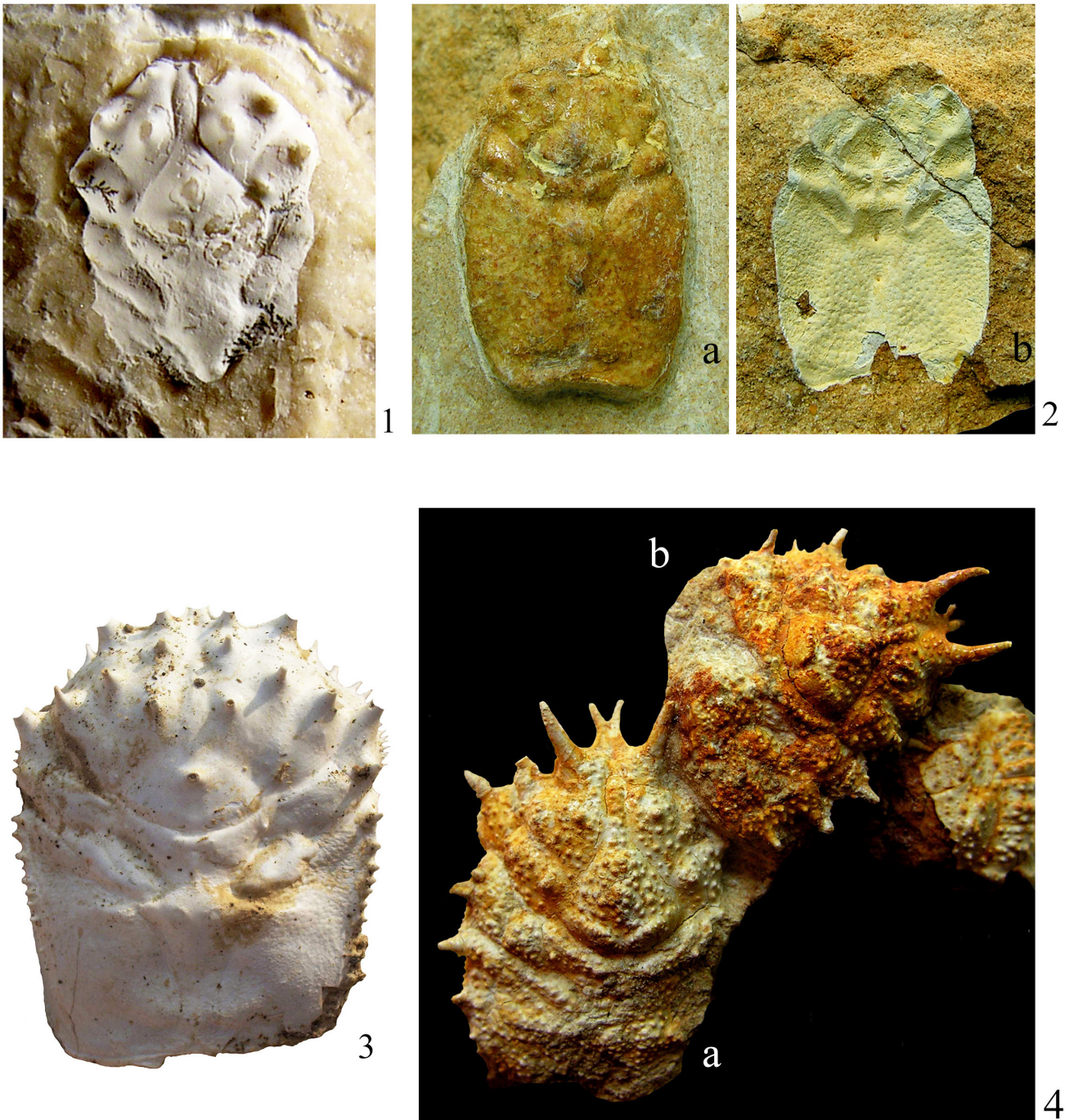
1e



1c

*Cherpihomola italica* n. gen., sp. nov.; 1a-e: MCZ 5759, holotype; a - dorsal view of carapace; b - lateral view of carapace; c - nodules of diagenetic origin associated with cheliped; d - right propodus; e - ambulatory legs; 2 - MCZ 5760, paratype, dorsal view of carapace.

PLATE 2



1. *Latheticocarcinus italicus* De Angeli & Ceccon, 2013, holotype; 2. *Homola vanzoi* Beschin, De Angeli & Zorzin, 2009, holotype, part (a) and counterpart (b); 3. *Homola barbata* (Fabricius, 1793); 4. *Nogarhomola aurorae* De Angeli & Alberti, 2012, holotype (a) and paratype (b).

mesogastric lobe marked by smooth grooves laterally and well-defined cervical groove posteriorly; protogastric lobe with two tubercles; narrow mesogastric lobe; triangular cardiac lobe, with three tubercles; long, narrow and smooth intestinal lobe, slightly depressed; metabranchial lobe with two small tubercles aligned along *linea ho-*

*molica*; smooth dorsal surface. Chelae with elongate palm with upper and lower margins almost parallel; outer surface of palm densely covered by punctuation, fixed finger about two-thirds of palm, long and straight. Long ambulatory legs, with denticulated upper margin.

**Discussion:** The carapace of this new homolid is characterised by a well-marked *linea homolica*, acute rostrum, one pseudorostral spine, one infra-orbital spine, one sub-hepatic spine, one anterolateral spine and two posterolateral spines, a deep cervical groove, nearly smooth and slightly raised dorsal regions and a narrow cardiac region, with three tubercles. Although *Cherpihomola* gen. nov. shares features of the rostrum and pseudorostral spines with *Paromola*, the latter has convex lateral margins with numerous spines and tuberculated dorsal regions, delimited by shallow grooves. *Paromola* is known from six modern and two extinct species, namely *Paromola vetula* Crawford, 2008 from the Paleogene of Río Negro Province (Argentina) and *Paromola roseburgensis* Nyborg & Garassino, 2017 from the Roseburg Formation (lower Oligocene) of Oregon (USA).

The new genus has affinities with *Latreillopsis* in showing near-parallel lateral margins, a similar arrangement of the frontal and lateral spines, a near-smooth dorsal surface and a narrow cardiac region with three tubercles. However, *Latreillopsis* has longer pseudorostral spines and one or more accessory spines in the rostrum, an epibranchial margin without a spine, while the posterolateral margin has a single robust spine.

Of other Cenozoic genera, *Prohomola* has densely tuberculated dorsal regions and deep cervical and branchiocardiac grooves (see Karasawa, 1992; Blow & Manning, 1996). *Dagnaudus* has a triangular, acute rostrum, long pseudorostral spines with two accessory spines, lateral margins with spines and tuberculated regions bounded by shallow grooves (see Jenkins, 1977). *Nogarhomola* has convex lateral margins with spines, a bifid rostrum and dorsal regions with tubercles (De Angeli & Alberti, 2012), while *Palehomola* has an oval carapace (larger posteriorly), a long, pointed rostrum that is strongly downturned, pseudorostral spines that are slightly longer than the rostrum and with two small basal spinules, as well as a large, inflated subhepatic region, with one large triangular spine and well-developed cervical and branchiocardiac grooves (Nyborg & Garassino, 2017).

### Fossil homolids from Italy

To date, only three genera are known from the fossil record. *Homola* Leach, 1815 with *H. vanzoi* Beschin, De Angeli & Zorzin, 2009 pl. 2, figs. 2a-b from the lower Eocene (Ypresian) of San Giovanni Ilarione (Verona) and *H. barbata* (Fabricius, 1793)

pl. 2, fig. 3, inhabiting the modern Atlantic Ocean (Portugal) and the Mediterranean Sea and occurring as a fossil in the upper Pleistocene (Tyrrhenian) of Trumbacà (Reggio Calabria). *Latheticocarcinus italicus* De Angeli & Ceccon, 2013 pl. 2, fig. 1 is known from the lower Eocene (Ypresian) of Monte Magrè (Schio, Vicenza), while *Nogarhomola aurorae* De Angeli & Alberti, 2012 pl. 2, figs. 4a-b has been described from the middle Eocene (Lutetian) of Nogarole Vicentino (Vicenza) (Beschinn et al., 2009; Garassino et al., 2010; De Angeli & Alberti, 2012; De Angeli & Ceccon, 2013). The new genus and species erected herein represents the first record of homolid crabs from Oligocene strata in Europe, thus enlarging their palaeogeographical distribution.

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