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## **Keys and bibliography for the identification of larval stages of brachyuran crabs from the Western Indian Ocean**

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## **Dedicatória**

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## Resumo

Os caranguejos braquiúros são um dos principais grupos animais dos ecossistemas costeiros, estando identificadas 6793 espécies, e são um dos grupos de macroinvertebrados mais abundantes em mangais e plataformas de marés em regiões tropicais. A região geográfica deste estudo do Oceano Índico Ocidental cobre uma vasta extensão, desde a região de Porto Elizabeth (África do Sul) até à Somália e os arquipélagos de Madagáscar, Seicheles, Comores, Reunião e Maurícia. Aproximadamente 430 espécies de braquiúros foram identificadas na região do Oceano Índico Ocidental, das quais 114 espécies apresentam descrições larvares completas (i.e., de todos os estádios larvares) ou parciais (de apenas alguns estádios). A ausência de descrições larvares fidedignas tem impedido a identificação da maioria das espécies de caranguejos braquiúros presentes no plâncton.

Não existe atualmente uma chave de identificação de estádios larvares de caranguejos braquiúros do Oceano Índico Ocidental, sendo que a maioria dos estudos nesta área incidem maioritariamente sobre caranguejos braquiúros do Oceano Atlântico.

A maioria dos caranguejos braquiúros tem um ciclo de vida complexo, durante o qual produzem larvas pelágicas que apresentam morfologia bastante diferente dos seus homólogos adultos. A maioria das espécies de caranguejos braquiúros eclode dos ovos na forma de zoé, sendo esta fase larvar pelágica. A fase zoé pode consistir de dois a nove ou mais estádios. Após o último estádio a larva sofre uma metamorfose e passa a designar-se megalopa, sendo nesta altura mais semelhante ao indivíduo adulto. Neste trabalho apenas foram utilizadas as descrições larvares do primeiro estádio zoé (ZI).

Os caranguejos braquiúros apresentam vários tipos de desenvolvimento larvar. O desenvolvimento regular foi descrito anteriormente e é o mais comum neste grupo de invertebrados juntamente com o abreviado (ocorrem menos estádios larvares ou estádios larvares de menor duração ou ambas as situações). O desenvolvimento também pode ser alargado (surtem mais estádios larvares e de maior duração, o que pode originar um desenvolvimento larvar com duração de vários meses até quase um ano), irregular (neste caso o desenvolvimento larvar de uma espécie apresenta um desvio ao que é considerado normal em espécies taxonomicamente próximas) ou desenvolvimento direto (onde não ocorrem estádios larvares com natação livre, mais comum em espécies de água doce e os indivíduos eclodem com morfologia muito semelhante aos adultos). Vários factores podem influenciar o tipo de desenvolvimento larvar de uma espécie. Em águas polares ou em água doce é mais comum as espécies de caranguejos braquiúros apresentarem desenvolvimento abreviado, devido à menor quantidade de alimento disponível nesses habitats. A quantidade de nutrientes disponível no ovo antes da eclosão também influencia o desenvolvimento larvar. As espécies que depositam ovos maiores tendem a apresentar fases larvares com menos estádios, como por exemplo as fêmeas da espécie *Uca subcylindrica* depositam ovos com um diâmetro médio de 1,06 mm e a fase zoé apresenta dois estádios enquanto que as fêmeas da maioria do género *Uca* depositam ovos com diâmetros médios entre 0,21 mm e 0,38 mm e a fase zoé apresenta cinco estádios larvares. As espécies que ocupam habitats altamente especializados também apresentam desenvolvimento abreviado de forma a reduzir o raio de dispersão larvar.

As descrições larvares devem seguir o padrão corporal básico, desde o sómito mais anterior até ao posterior como se detalha seguidamente: carapaça (espinhos dorsal, rostral e laterais, olhos, cerdas superficiais e cerdas marginais ventrais), anténula (endopódio e exopódio), antena (protopódio, endopódio e exopódio), mandíbula (segmentação do endopódio, presença ou ausência do palpo molar), maxílula (endito coxal, endito basal, presença ou ausência de cerdas no endopódio e exopódio), maxila (endito coxal, endito basal, endopódio e exopódio / escafognatito), primeiro maxilípede (coxopodito, basipodito, endopódio e exopódio), segundo maxilípede (coxopodito, basipodito, endopódio e exopódio), terceiro maxilípede (se está desenvolvido ou não), pereópodes (se estão desenvolvidos ou não), abdómen (número e forma dos sómitos, processos dorsolaterais, cerdas posterolaterais, cerdas dorsais, processo espinhosos posterolaterais e pleópodes) e telson (tamanho e forma, cerdas furcais).

Este trabalho tentou colmatar uma lacuna no conhecimento larvar de caranguejos braquiúros no Oceano Índico Ocidental, visto que o estudo da fase larvar destes invertebrados tem imensas aplicações como estudos de recrutamento e dispersão, depleção de recursos económica e biologicamente importantes e vulneráveis à sobre-exploração, estudos de diversidade populacional numa determinada região, sistemática, análise de comportamento larvar, determinação de tempos de reprodução de espécies de caranguejos braquiúros, entre várias temáticas.

As chaves de identificação apresentadas neste trabalho estão divididas em duas áreas. Primeiro foi elaborada uma chave de identificação geral, separando as 61 famílias presentes na região do Oceano Índico Ocidental, principalmente através de características morfológicas externas e, quando não existia alternativa, através de características que necessitam de disseção para serem observadas. É de notar que das 61 famílias presentes nesta região, oito não foram incluídas na chave de identificação devido a não terem sido encontradas quaisquer descrições larvares de espécies pertencentes a essas famílias nem qualquer descrição geral dessas mesmas famílias. As famílias que não foram incluídas na chave de identificação geral são Cyclodorippidae, Dairoididae, Acidopsidae, Chasmocarcinidae, Mathildellidae, Pseudoziidae, Retroplumidae e Trichopeltariidae.

De seguida foi realizada uma breve descrição de cada família e das 53 famílias presentes na chave de identificação, 23 apresentam mais do que uma espécie com descrição larvar. Para cada uma dessas famílias foi elaborada uma chave de identificação a nível da espécie. As famílias com informação suficiente para a elaboração das chaves de identificação são Dromiidae, Homolidae, Calappidae, Carpiliidae, Dorippidae, Eriphiidae, Oziidae, Goneplacidae, Leucosiidae, Epialtidae, Inachidae, Majidae, Pilumnidae, Portunidae, Tetraliidae, Trapeziidae, Xanthidae, Grapsidae, Plagusiidae, Sesarmidae, Macrophthalmidae, Ocypodidae e Hymenosomatidae. É de notar que a chave de identificação geral não segue uma ordem taxonómica, estando as famílias separadas por caracteres que podem não refletir os grupos taxonómicos. No entanto as descrições e chaves de cada família estão agrupadas por ordem taxonómica.

Apesar deste trabalho terem resultado várias chaves de identificação que poderão ser úteis para investigações futuras, aconselha-se cautela na sua utilização pois, como foi referido anteriormente, apenas 27% das espécies identificadas como presentes na região do Oceano Índico Ocidental têm descrição larvar, o que, devido à elevada semelhança morfológica interespecífica dentro das famílias, pode aumentar a probabilidade de erro em famílias com poucas descrições disponíveis. Para colmatar esta lacuna e no futuro acrescentar valor a estas chaves, será necessário que mais investigação seja feita sobre as larvas de caranguejos braquiúros nesta região. Outro factor que inspira cautela na utilização destas chaves é o facto de apenas se ter utilizado o primeiro estadio larvar zoé (ZI). A decisão de utilizar apenas este estadio foi tomada pois é o único estadio que surge em todas as descrições larvares consultadas, principalmente porque a maioria dos estudos de descrição foram efetuados com espécimes criados em laboratório e, sendo um processo que requer muitos cuidados, por vezes é difícil obter espécimes de estadios larvares posteriores.

**Palavras-chave:** Brachyura; chave de identificação; Oceano Índico Ocidental; primeiro estadio larval; zoé

## **Abstract**

Brachyuran crabs are one of the major animal groups of coastal ecosystems with 6793 species and are one of the most abundant macroinvertebrates in mangroves and tidal flats in tropical regions. Approximately 430 brachyuran species have been identified as inhabiting the Western Indian Ocean (WIO), of which 114 species have full or partial larval descriptions available. The absence of reliable larval descriptions has prevented marine biologists from identifying the majority of species in the plankton.

This geographical area does not have a comprehensive identification key of brachyuran larval stages. An identification key is provided for family level and identification keys to species level are provided for most families, based on available descriptions. These keys were constructed using mostly external morphological characters although, due to the restricted number of morphological features, the observation of some characters require dissection. The larval descriptions should follow the basic body pattern, from the most anterior somite to the posterior, as follows: carapace (dorsal, rostral and lateral spines, eyes, surface setae and ventral marginal setae), antennule (endopod and exopod), antenna (protopodal process/spinous process, endopod and exopod), mandible (segmentation of the endopod/mandibular palp), maxillule (coxal endite, epipod seta, basal endite, endopod and exopod seta), maxilla (coxal endites, basal endites, endopod and exopod/scaphognathite), first maxilliped (coxa, coxal epipod, basis, endopod and exopod), second maxilliped (coxa, coxal epipod and gill, basis, endopod and exopod), third maxilliped (developed or not), pereopods (developed or not), abdomen (number and shape of somites, dorsolateral processes, posterolateral setation, dorsomedial setae, posterolateral spinous processes and pleopods) and telson (telson forks lateral and dorsomedial armature, posterior marginal setae, paired dorsomedial setae and shape and relative size)

This study tries to fill a gap in the knowledge of brachyuran crab larvae in the WIO as it has many useful applications: dispersal and recruitment studies, possible depletion of species vulnerable to overexploitation, evaluating a species diversity in a region and in specifying the reproduction time of brachyuran species, systematics, analyses of physiological ecology and analysis of larval behaviour.

The identification keys provided in this study are separated in two categories. Firstly, a general identification key was elaborated, dividing the 61 families that are present in the WIO region, although eight of those 61 families were not included in this key because no larval description was found for these families. The eight families not included in the family identification key are Cyclodorippidae, Dairoididae, Acidopsidae, Chasmocarcinidae, Mathildellidae, Pseudoziidae, Retroplumidae and Trichopeltariidae. Then a brief description for each of the 61 families is presented and of the 53 families presented in the family identification key, 23 have more than one species with larval description. For each those 23 families an identification key was elaborated to the species level. The following families have an identification key: Dromiidae, Homolidae, Calappidae, Carpiliidae, Dorippidae, Eriphiidae, Oziidae, Goneplacidae, Leucosiidae, Epialtidae, Inachidae, Majidae, Pilumnidae, Portunidae, Tetraliidae, Trapeziidae, Xanthidae, Grapsidae, Plagusiidae, Sesarmidae, Macrophthalmidae, Ocypodidae and Hymenosomatidae.

Although this study contains several keys that will be useful in future projects, the keys must be used with caution as only the first zoeal stage (ZI) was considered and because 73% of the species identified do not have larval descriptions available.

**Key words:** Brachyura; identification key; Western Indian Ocean; first zoea larva; zoea

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# **Chapter 1**

**General introduction**

## **Introduction**

Brachyuran crabs are one of the major animal groups in the coastal ecosystems, with 6793 species (Ng, Guinot and Davie, 2008). The brachyuran crabs, also called true crabs, are a diverse group of animals and occupy several habitats, from abyssal depths of 6000 meters to 2000 meters above sea level and are dominant in estuarine habitats, such as mangroves and tidal flats in tropical regions, where they are subjected to daily variations of temperature and salinity (Clark and Paula, 2003; Ng, Guinot and Davie, 2008). Many species have evolved to be terrestrial, some only returning to water to spawn, others have adapted to live solely in freshwater. The high adaptability and the ability of surviving in extreme habitats by brachyuran crabs makes them very tolerant to environmental changes, natural or anthropogenic (Guinot and Hurtado, 2003; Cannicci *et al.*, 2009; Klaus and Plath, 2011; Fusi *et al.*, 2015). Brachyuran crabs are opportunistic feeders and are an important part of the trophic webs of aquatic ecosystems either as primary or secondary consumers (Dye and Lasiak 1986; Miller and Morgan 2015) or as top predators (Klaus and Plath, 2011).

According to the Food and Agriculture Organization of the United Nations (FAO) data, brachyuran crabs represent 20% of all crustaceans captured and farmed worldwide. In 2015 a total 6562540 tonnes of true crabs were captured or farmed (FAO, 2015). In many communities the capture of these crabs represents the main source of income. For example it is extremely common to encounter human populations near mangrove areas, which function as nursery areas for many species fish, mollusc and brachyuran crabs, that depend directly on these resources as a source of subsistence and income (Rönnbäck, 1999; Santos *et al.* 2014, 2016, 2017; Satyanarayana *et al.* 2013; Walters *et al.* 2008)

. Most fisheries in the Western Indian Ocean (WIO) region are artisanal in nature (35%) followed by subsistence (21%) and small-scale commercial (16%) (Everett *et al.*, 2015).

## **Importance of larval studies**

The larvae of crustaceans, including those of brachyuran crabs, are a significant part of zooplanktonic communities, constituting an ecologically important fraction of the pelagic communities. The study of brachyuran crab larvae has many useful applications: dispersal and recruitment studies, possible depletion of species vulnerable to overexploration (Clark and Paula, 2003), evaluating a species diversity in a region and in specifying the reproduction time of brachyuran species (Kornienko and Korn, 2009), systematics, analyses of physiological ecology and analysis of larval behaviour (Hines, 1986).

There is no comprehensive key for the brachyuran crab larvae for the WIO region. Most of the work on larval identification has been carried out in other regions of the world, in particular in the Atlantic Ocean (Martin, 1984; Paula, 1996; Fransozo, Cuesta and Negreiros-Fransozo, 1998; Pessani, Burri and Salton, 1998; Anosov, 2000; Dos Santos and González-Gordillo, 2004; Rice and Tsukimura, 2007; Kornienko and Korn, 2009; Koettker *et al.*, 2012).

Most of the brachyuran crab larvae from WIO are either undescribed or their descriptions by early authors do not meet the modern requirements for accurate comparative studies (Clark, Calazans and Pohle, 1998). The absence of reliable larval descriptions has prevented marine biologists from identifying the majority of species in the plankton (Clark and Paula, 2003). However, during the past

few years, a number of adequate descriptions was made, which permit to develop a more consistent approach to larval identification in the Western Indian Ocean.

### Brachyuran life history

The majority of brachyuran crabs have a complex life history in which they produce pelagic larvae that present different morphology from their adult counterparts (Anger, 2001). The larvae occupy a different habitat from their juveniles and adults, thus having different ecological requirements. After the larval period in which growth is anamorphic, the larvae will undergo a metamorphosis and a complex return migration to the habitats where they will spend their juvenile and adult phases. The pelagic larval phase is a significant period for dispersal, recruitment and renovation of populations (McConaugha, 1992).

There are several phases in between the egg and the adult form of crustaceans: nauplius, zoea, megalopa and post larva (juvenile and adult forms) (Clark and Cuesta, 2015). In brachyuran crabs, as in most of the decapod crustaceans, the naupliar phase is confined to the egg, and the larvae hatch as zoeae. In this study only the first stage of the zoeal phase was considered.

The zoeal phase can be comprised of as little as two stages (as for example in the Majoidea, figure 1.1) to as many as nine stages (figure 1.2).

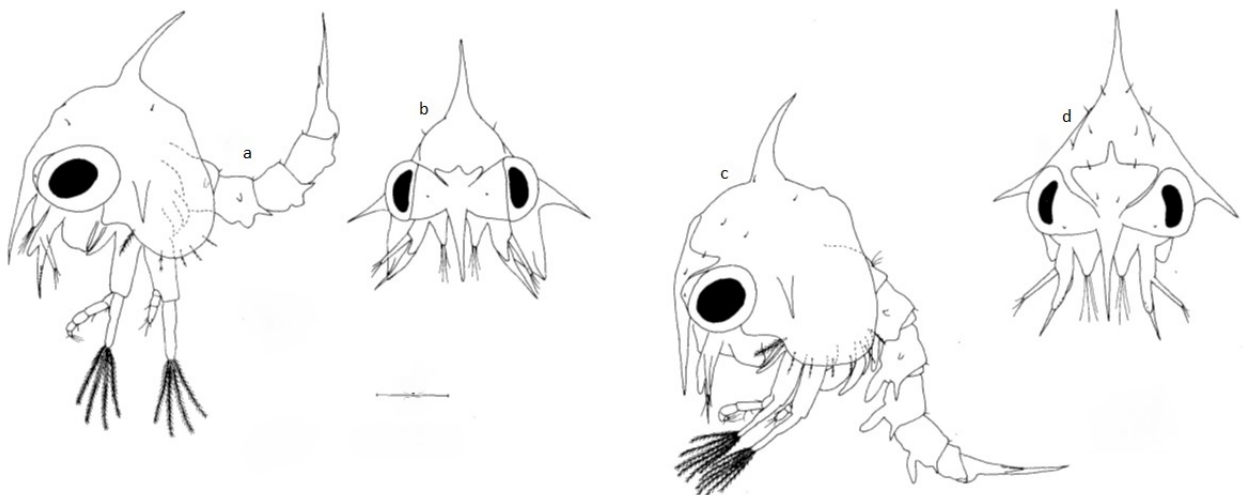


Figure 1.1 – Lateral and frontal view of Zoea I (a-b) and Zoea II (c-d) of *Maja goitziana*, (adapted from Paula, 1988). Scale bar = 0.5 mm

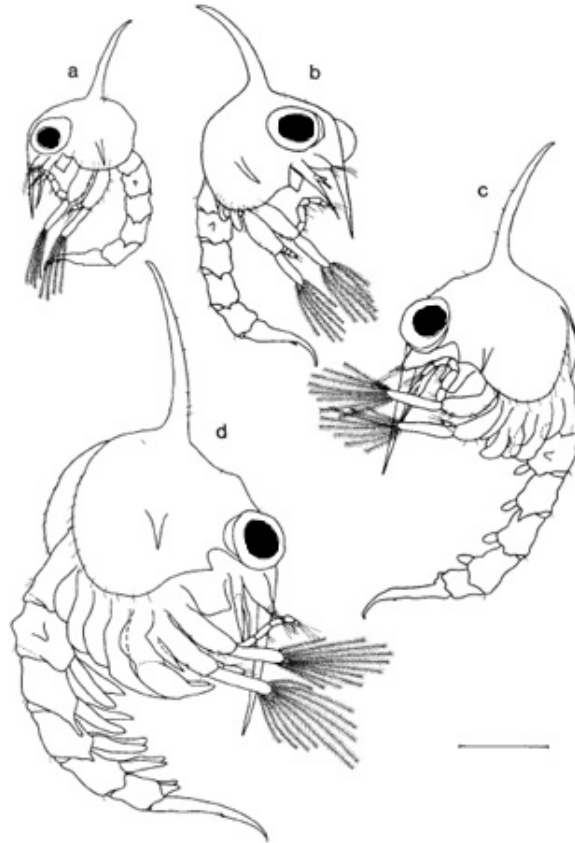


Figure 1.2 – Lateral view of Zoea I to Zoea IV (a-d) of *Pirimela denticulata*. (adapted from Flores and Paula, 2000). Scale bar = 0.5 mm

Brachyuran zoeae have natatory exopods exclusively on maxillipeds 1 and 2, and, except in some of the ancestral taxa, maxilliped 3 and the pereopods are never functional during the zoeal phase (Anger, 2001).

There are several types of larval development in Brachyuran crabs: regular, as described earlier; abbreviated, shorter than normally or even direct development where there are no free-swimming larval stages (this is most common in freshwater species); extended (more larval stages or longer larval stages or both) and irregular development (the duration and number of larval stages deviates from what is seen in related species) (Gore, 1985). The most common types are regular and abbreviated development.

Several factors can contribute to the abbreviated larval development of a species. It tends to be more common in freshwater and polar species, and in species where the adult is terrestrial or abyssal (Williamson, 1982; Anger, 2001). The size of the eggs is also an important variable, as smaller eggs tend to indicate more larval stages. For example most of the species in the *Uca* genus generate small eggs (between 0.21-0.28 or 0.34-0.38 mm in diameter) and present a regular development with five zoeal stages, but *Uca subcylindrica* produces eggs with 1.06 mm in diameter and only presents two zoeal stages (Rabalais and Gore, 1985). Larval nutrition also influences larval development; compared to planktotrophic species, lecithotrophic species present a reduction in the length of each larval stage and frequently with fewer number of stages (Levin and Bridges, 1995; Anger, 2001).

Crabs living in highly specialized habitats also present abbreviated development because it reduces the chances of larval dispersion (Rabalais and Gore, 1985).



## Larval Morphology

The standards of larval descriptions were established by Clark *et al.* (1998) and Clark and Cuesta (2015) to increase accuracy and consistency in larval studies. Most recent available descriptions have followed this standard.

The larval descriptions should follow the basic body pattern, from the most anterior somite to the posterior, as follows: carapace (dorsal, rostral and lateral spines, eyes, surface setae and ventral marginal setae), antennule (endopod and exopod), antenna (protopodal process/spinous process, endopod and exopod), mandible (segmentation of the endopod/mandibular palp), maxillule (coxal endite, epipod seta, basal endite, endopod and exopod seta), maxilla (coxal endites, basal endites, endopod and exopod/scaphognathite), first maxilliped (coxa, coxal epipod, basis, endopod and exopod), second maxilliped (coxa, coxal epipod and gill, basis, endopod and exopod), third maxilliped (developed or not), pereopods (developed or not), abdomen (number and shape of somites, dorsolateral processes, posterolateral setation, dorsomedial setae, posterolateral spinous processes and pleopods) and telson (telson forks lateral and dorsomedial armature, posterior marginal setae, paired dorsomedial setae and shape and relative size) (see figure 1.3).

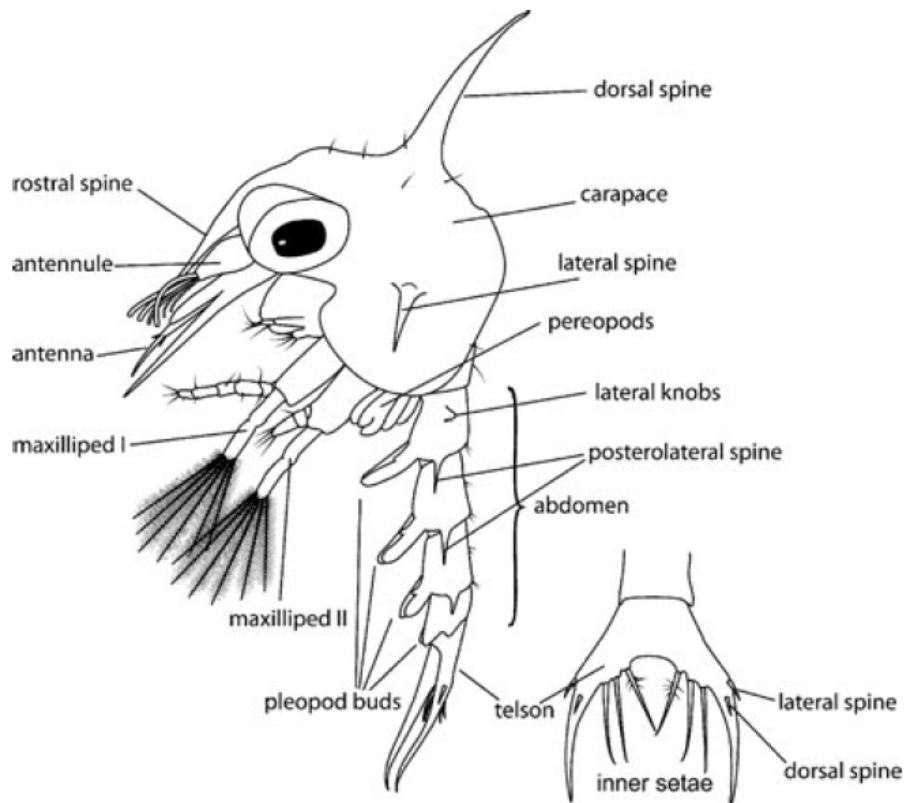


Figure 1.3 – Main characters used for larval descriptions (adapted from Kornienko and Korn, 2009).

## Study area

The geographical area of this study is the Western Indian Ocean (WIO), covering the Eastern coast of Africa, from Somalia to Port Elizabeth in South Africa (including Kenya, Tanzania and Mozambique), Madagascar, Seychelles, Comoros, Reunion and Mauritius (figure 1.4).

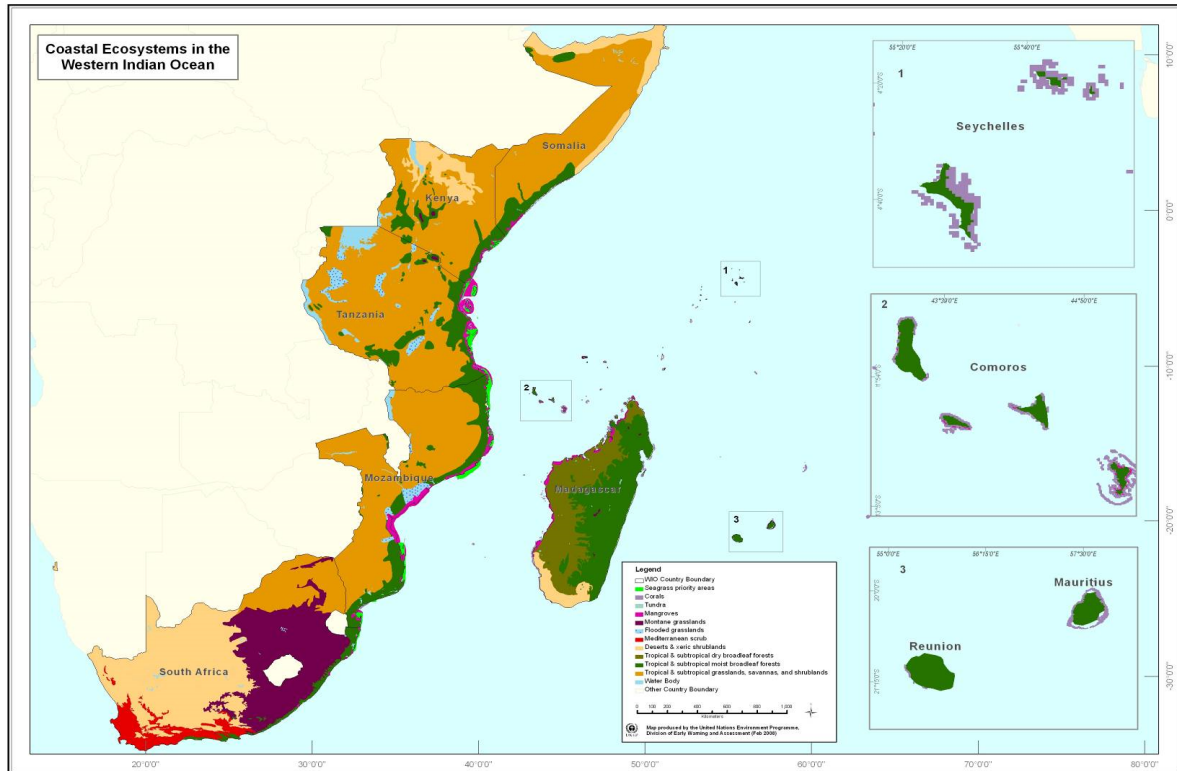


Figure 1.4 - Study area: the Western Indian Ocean (adapted from [http://projects.inweh.unu.edu/inweh/inweh/content/1247/IWLEARN/wiolab-tda-38\\_1.jpg](http://projects.inweh.unu.edu/inweh/inweh/content/1247/IWLEARN/wiolab-tda-38_1.jpg))

## Objectives

The aims of this study are: compiling the available larval descriptions and produce identification keys for the families and for the species in each family. The basic structure of the identification keys is based on the work of Rice (1980) and Clark and Cuesta (2015), on the available published descriptions and on unpublished descriptions from laboratory rearings, which include *Dotilla fenestrata*, *Chaenostoma boscii*, *Macrophthalmus depressus*, *M. grandidieri*, *Uca annulipes*, *U. chlorophthalmus*, *U. urvillei* and *U. vocans* (Paula *et al.*, unpublished).

Due to the restricted number of morphological features used for brachyuran larval identification, some characters require dissection to be observed.

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# **Chapter 2**

**Keys and bibliography for the identification of larval stages of brachyuran crabs from the Western Indian Ocean**

# Keys and bibliography for the identification of larval stages of brachyuran crabs from the Western Indian Ocean

## Abstract

Approximately 430 brachyuran species have been identified as inhabiting the Western Indian Ocean (WIO), of which only 114 species have full or partial larval descriptions available. An identification key is provided for family level and identification keys to species level are provided for most families, based on available descriptions. These keys were constructed using mostly external morphological characters. Only the first zoeal stage was considered.

**Key words:** Brachyura; identification keys; Western Indian Ocean; first zoea larva

## Introduction

Brachyuran crabs are one of the major animal groups in the coastal ecosystems with 6793 species (Ng, Guinot and Davie, 2008) and are one of the most abundant macroinvertebrates in mangroves and tidal flats in tropical regions (Clark and Paula, 2003). Four hundred and thirty species of brachyuran crabs have been identified as inhabiting the Western Indian Ocean (see Appendix A).

The geographical area of this study is the Western Indian Ocean (WIO), covering the Eastern coast of Africa, from Somalia to Port Elizabeth in South Africa (including Kenya, Tanzania and Mozambique), Madagascar, Seychelles, Comoros, Reunion and Mauritius (figure 2.1).

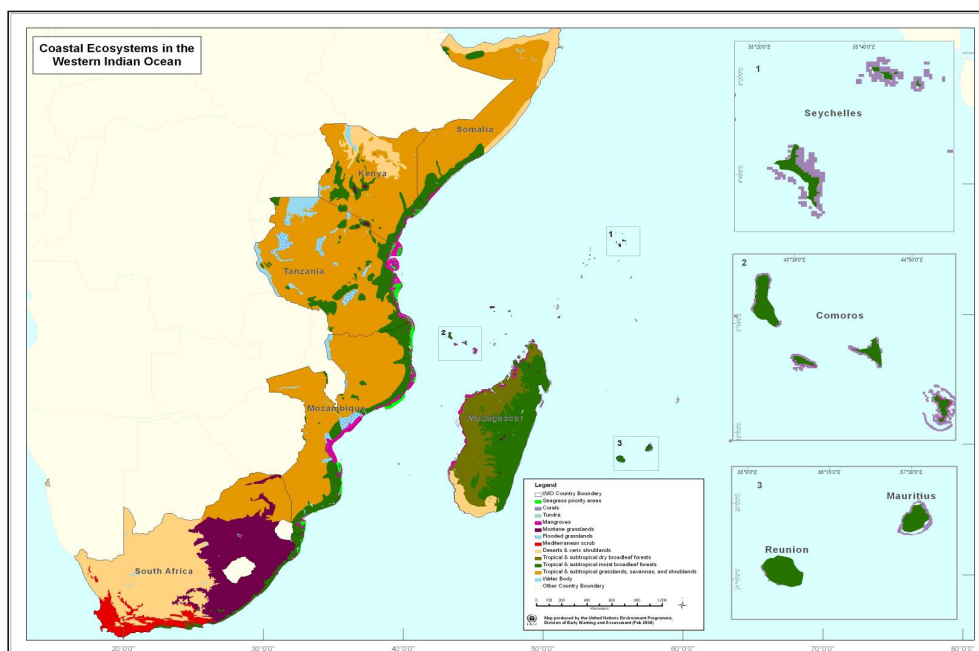


Figure 2.1 - Study area: Western Indian Ocean (adapted from [http://projects.inweh.unu.edu/inweh/inweh/content/1247/IWLEARN/wiolab-tda-38\\_1.jpg](http://projects.inweh.unu.edu/inweh/inweh/content/1247/IWLEARN/wiolab-tda-38_1.jpg))

In this study, a key for the identification of the families is provided, along with keys for the identification of species within each family, together with a bibliography of those larval descriptions. The identification keys are based on the work of Rice (1980) and Clark and Cuesta (2015), on the available published descriptions and on unpublished descriptions from laboratory rearings, which include *Dotilla fenestrata*, *Chaenostoma boscii*, *Macrophthalmus depressus*, *M. grandidieri*, *Uca annulipes*, *U.*

*chlorophthalmus*, *U. urvillei* and *U. vocans* (Paula *et al.*, no date). The majority of the descriptive work has been carried out on Atlantic species, leaving the brachyuran fauna of this geographic area rarely investigated (Flores, Paula and Dray, 2003).

## Materials and Methods

The species in the WIO area were identified through research, mainly using the works of Kensley (1981) and Emmerson (2016), and also using information from the online database GBIF (<http://www.gbif.org>). The identification key of families was primarily based on the work of Rice (1980) and Clark and Cuesta (2015). The keys for individual families were based on published descriptions and on unpublished work (Paula *et al.*, no date). Taxonomic information was revised on Ng *et al.* (2008) and on the online database WoRMS (<http://www.marinespecies.org>).

When possible external morphological characters of brachyuran zoal stage I (ZI) were used to build the keys (figure 2.2), however due to the restricted number of morphological features used for brachyuran larval identification, some characters require dissection to be observed, such as maxillar setation.

The freshwater family Potomonautidae has been excluded from this study as only saltwater and brackish species have been considered, and also due to the fact that species of this family have direct development.

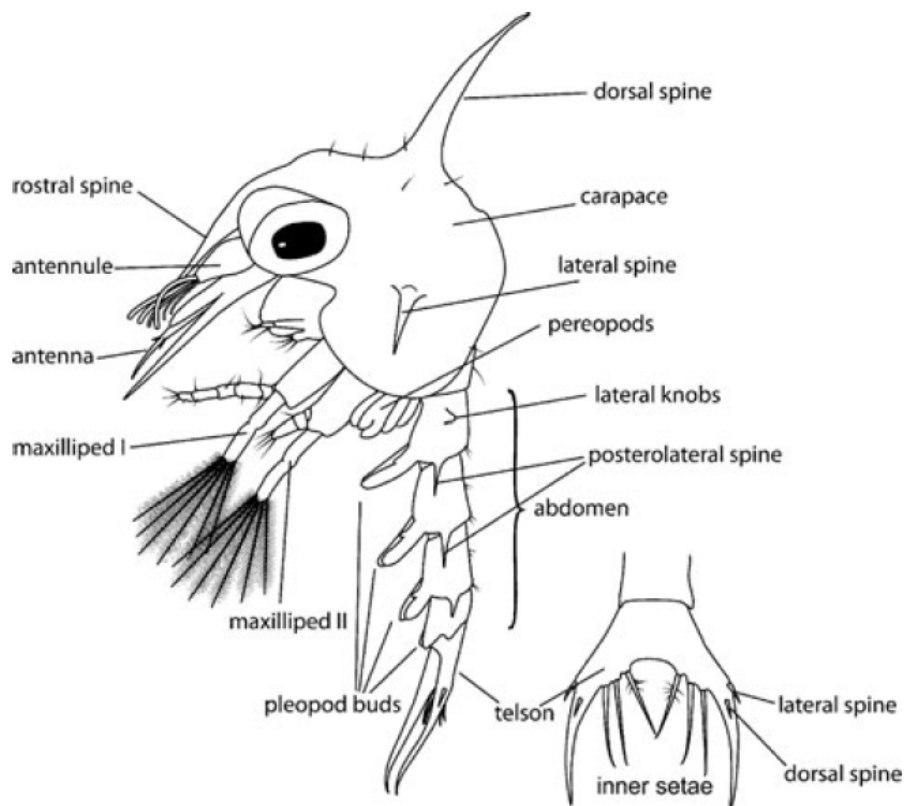


Figure 2.2 - Main characters used for larval descriptions (adapted from Kornienko and Korn, 2009)



## Identification Keys

### Identification Key of Families

1. Antennal exopod flat and scale-like 2  
Antennal exopod rod-like, reduced or absent, but never a flat scale 8
2. Carapace without spines 3  
Carapace with spines 4
3. Telson not furcated, triangular shape, with long marginal plumose setae and spines on posterolateral margins DYNOMENIDAE (page 18)  
Telson furcated with long terminal, serrulate setae along the inner and apical part of the furcal rami HOMOLODROMIIDAE (page 18)
4. Rostral spines anteriorly directed 5  
Rostral spines ventrally directed 7
5. Telson furcated with long terminal, serrulate setae along the inner and apical part of the furcal rami DROMIIDAE (page 17)  
Telson not furcated, triangular shape, with long marginal plumose setae and spines on posterolateral margins 6
6. Carapace lateral spines present; abdominal somites with dorsolateral and posterolateral processes HOMOLIDAE (page 18)  
Carapace lateral spines absent; abdominal somites without dorsolateral and posterolateral processes LATREILLIIDAE (page 18)
7. Telson furcated with long terminal, serrulate setae along the inner and apical part of the furcal rami; maxillule endopod bilobed with 1+3 setae CYMONOMIDAE (page 17)  
Telson not furcated, triangular shape, with long marginal plumose setae and spines on posterolateral margins; maxillule endopod bilobed with 0+(4/5) setae RANINIDAE (page 19)
8. Two zoeal stages, that is never with more than 6 natatory setae on the exopods of the maxillipeds. In stage I (with 4 natatory setae) the scaphognathite has at least 9 marginal setae. In stage II (with 6 natatory setae) there are well-developed pleopods on abdominal somites 2 – 5, at least as long as their respective somites. Basal segment (ischium) of endopod of first maxilliped always with 2 medial setae 9 (MAJOIDEA)  
Almost always with more than two zoeal stages, so that there may be 8 or more natatory setae. In stage I the scaphognathite almost always has less than 9 marginal setae usually 3 or 4); if there are more than 9 marginal setae in stage I, the basal segment of the first maxilliped carries 3 medial setae. Pleopods never well-developed in zoeae with 6 natatory setae 13



21. Carapace lateral spine present, basis of first maxilliped with 9 setae (2,2,2,3)		
		PALICIDAE (page 27)
Carapace lateral spine absent, basis of first maxilliped with 8 setae (2,2,2,2)		
		GRAPSIDAE ( <i>Metopograpsus</i> sp.) (page 34)
22. Telson rectangular; maxilla endopod with 2+2 setae		
		GRAPSIDAE (excluding <i>Metopograpsus</i> sp.) (page 34)
Telson elongate trapezoidal, wider anteriorly; maxilla endopod with 2+3 setae		
		HYMENOSOMATIDAE (page 38)
23. Antennal exopod well developed, generally similar in size or longer than protopod and with medial setae		24
Antennal exopod shorter than protopod, with terminal setae and spines		33
24. Telson furca unarmed		25
Telson furca armed		26
25. Pleonal lateral expansions on abdominal somite 5		
		MACROPHTHALMIDAE (page 36)
Pleonal lateral expansions on abdominal somites absent		
		VARUNIDAE (page 36)
26. Telson furca armed with dorsal and lateral spines		27
Telson furca armed with dorsal or lateral spines		29
27. Posterolateral processes on abdominal somites 2-5		GONEPLACIDAE (page 23)
Posterolateral processes on abdominal somites 3-5		28
28. Dorsolateral processes on abdominal somites 2-3		PILUMNIDAE (page 27)
Dorsolateral processes on abdominal somites 2-4		GERYONIDAE (page 28)
29. Pleonal lateral expansions on abdominal somite 4		CRYPTOCHIRIDAE (page 33)
Pleonal lateral expansions on abdominal somites absent		30
30. Dorsolateral processes on abdominal somite 2		HEXAPODIDAE (page 24)
Dorsolateral processes on abdominal somites 2-3 or 2-4		31
31. Dorsolateral processes on abdominal somites 2-4		CAMPTANDRIIDAE (page 36)
Dorsolateral processes on abdominal somites 2-3		32
32. Telson furca with lateral spines; maxilla endopod bilobed with 3+5 setae; basis of second maxilliped with 4 setae		EURYPLACIDAE (page 23)
Telson furca with lateral or dorsal spines; maxilla endopod bilobed with 2+3 setae; basis of second maxilliped with 3 setae		DOTILLIDAE (part) (page 36)
33. Dorsolateral processes only on abdominal somite 2		34
Dorsolateral processes on abdominal somites 2-3/5		38

34. Telson furcal rami armed with dorsal spines or lateral spines	35
Telson furcal rami armed with dorsal and lateral spines	36
35. Telson furcal rami armed with dorsal spines	CORYSTIDAE (page 21)
Telson furcal rami armed with lateral spines	MENIPPIDAE (page 22)
36. Carapace lateral spines absent	CARCINIDAE (page 28)
Carapace lateral spines present	37
37. Posterolateral processes on abdominal somites 2-4	ATELECYCLIDAE (page 20)
Posterolateral processes on abdominal somites 3-5	CANCRIDAE (page 20)
38. Abdominal somite 1 with middorsal process	39
Abdominal somite 1 without processes	40
39. Two pairs of carapace lateral spines; maxilla endopod bilobed with 3+5 setae	
	TRAPEZIIDAE (page 31)
One pair of carapace lateral spines; maxilla endopod bilobed with 1+2 setae	
	OCYPODIDAE ( <i>Ocypode ceratophthalmus</i> ) (page 37)
40. Dorsolateral processes on abdominal somites 2-5	41
Dorsolateral processes on abdominal somites 2-3	44
41. Telson furcal rami armed with lateral spines	42
Telson furcal rami armed with lateral and dorsal spines	43
42. Basis of first maxilliped with 8 setae arranged 2,2,2,2	
	PLAGUSIIDAE (page 34)
Basis of first maxilliped with 9 setae arranged 2,2,3,2	
	PERCNIDAE (page 34)
43. Carapace lateral spines present	ERIPHIIDAE (page 22)
Carapace lateral spines absent	CARPILIIDAE (page 20)
44. Posterolateral processes on somites 2-5 or absent	45
Posterolateral processes on somites 3-5	48
45. Telson furcal rami unarmed or armed with dorsal spines	
	OCYPODIDAE (except <i>Ocypode ceratophthalmus</i> ) (page 37)
Telson furcal rami armed with dorsal and lateral spines	46
46. Ventral spines present on telson furcal rami	PANOPEIDAE (page 32)
Ventral spines absent on telson furcal rami	47
47. Maxilla endopod with 2+5 setae; basis of first maxilliped with 8 setae (2,2,2,2); maxillule endopod with 0+6 setae	CALAPPIDAE (page 19)

Maxilla endopod with 3+5 setae; basis of first maxilliped with 10 setae (2,2,3,3); maxillule endopod with 1+6 setae	OZIIDAE (page 22)
48. Telson furcal rami unarmed or armed with dorsal or lateral spines	49
Telson furcal rami armed with dorsal and lateral spines	51
49. Carapace lateral spines absent	SESARMIDAE (page 35)
Carapace lateral spines present	50
50. Maxillule endopod with 0+4 setae; basis of second maxilliped with 3 setae (1,1,1); endopod of second maxilliped with 0,1,6 setae	DOTILLIDAE (part) (page 36)
Maxillule endopod with 1+5 setae; basis of second maxilliped with 4 setae (1,1,1,1); endopod of second maxilliped with 1,1,6 setae	GECARCINIDAE (page 33)
51. Proximal segment of maxilla endopod with 2 setae	52
Proximal segment of maxilla endopod with 3 setae	54
52. Maxillule endopod bilobed with 1+5 setae; distal segment of maxilla endopod with 3 setae	TETRALIIDAE (page 30)
Maxillule endopod bilobed with 1+6 setae; distal segment of maxilla endopod with 4 or more setae	53
53. Basis of first maxilliped with 10 setae; distal segment of maxilla endopod with 4 setae	PORTUNIDAE (page 29)
Basis of first maxilliped with 8 setae; distal segment of maxilla endopod with 5 setae	PARTHENOPIDAE (page 27)
54. Basis of first maxilliped with 9 or less setae	55
Basis of first maxilliped with 10 setae	56
55. Basis of first maxilliped with 8 setae (2,2,2,2); endopod of first maxilliped 5- segmented with 2,2,1,2,5 setae	POLYBIIDAE (page 29)
Basis of first maxilliped with 9 setae (2,2,3,2); endopod of first maxilliped 5- segmented with 3,2,1,2,5 setae	AETHRIDAE (page 19)
56. Endopod of first maxilliped 5-segmented with 2,2,1,2,5 setae	OVALIPIDAE (page 28)
Endopod of first maxilliped 5-segmented with 3,2,1,2,5 setae	57
57. Maxilla endopod bilobed with 3+5 setae	XANTHIDAE (page 32)
Maxilla endopod bilobed with 3+3 setae	DAIRIDAE (page 21)

## Cyclodorippidae

The Cyclodorippidae family has four species in the WIO area distributed by two subfamilies, Cyclodorippinae and Xeinostomatinae. The Cyclodorippinae subfamily is represented by three species, *Corycodus decorus*, *C. disjunctipes* and *C. merweae*; the Xeinostomatinae subfamily is represented by one species, *Xeinostoma eucheir*. This family occupies benthic habitats within the depth range of 20 meters to 1200 meters.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

## Cymonomidae

The Cymonomidae family has three species in the WIO area, all belonging to the same genus, *Cymonomus mainbaza*, *C. trifurcus* and *C. valdivae*. This family occupies deep-sea habitats, mostly in the 500 meters to 800 meters depth range.

The zoeae of this family present a ventrally directed rostral spine and a furcated telson with long terminal, serrulate setae along the inner and apical part of the furcal rami.

None of the species identified has larval descriptions.

## Dromiidae

The Dromiidae family has 28 species in WIO area, distributed by 16 genera, *Ascidiophilus caphyraeformis*, *Barnardromia bituberculata*, *B. hirsutimana*, *Conchoecetes artificiosus*, *Cryptodromia bullifera*, *C. fallax*, *Dromia dormia*, *Dromidia aegibotus*, *D. cornuta*, *D. dissothrix*, *D. hirsutissima*, *D. lepidota*, *Eudromidia frontalis*, *E. hendersoni*, *Exodromidia spinosa*, *E. spinosissima*, *Hemisphaerodromia monodous*, *Lauridromia dehaani*, *L. intermedia*, *Lewindromia unidentata*, *Metadromia wilsoni*, *Platydromia spongiosa*, *Pseudodromia cacuminis*, *P. latens*, *P. rotunda*, *P. trepida*, *Speodromia platyarthodes* and *Tumidodromia dormia*, all belonging to the subfamily Dromiinae. This family occupies a diverse range of habitats, from the intertidal to depths of 600 meters. The zoeae of this family present a furcated telson with long terminal, serrulate setae along the inner and apical part of the furcal rami, and rostral spine is anteriorly directed.

Of the 28 species identified only two have larval descriptions: *Conchoecetes artificiosus* and *Lauridromia dehaani* (McLay, Lim and Ng, 2001).

1. Antennule exopod with 1 plumose seta and 6 aesthetascs; basis of first maxilliped with 12 plumose setae (arranged 3,3,3,3); coxa of first maxilliped with 2 plumose setae  
*Conchoecetes artificiosus*  
Antennule exopod with 1 plumose seta and 5 aesthetascs; basis of first maxilliped with 11 plumose setae (arranged 2,3,3,3); coxa of first maxilliped with 1 plumose seta  
*Lauridromia dehaani*

## Dynomenidae

The Dynomenidae family has one species in the WIO area, *Dynomene pilumnoides*. This family is mostly found in Madagascar and it is commonly associated with reefs.

The zoeae of this family present a non furcated telson, triangular and with long setae and spines on the posterolateral margins, and have no carapace spines.

The larvae of the species identified have not been described.

## Homolodromiidae

The Homolodromiidae family has one species in the WIO area, *Homolodromia bouvieri*. This family is benthic, mostly in the 300 meters to 900 meters depth range.

The zoeae present a furcated telson with long terminal, serrulate setae along the inner and apical part of the furcal rami, and have no carapace spines.

The larvae of the species identified have not been described.

## Homolidae

The Homolidae family has 10 species in the WIO area distributed by seven genera, *Homola barbata*, *H. orientalis*, *Homolochunia valdividae*, *Ihlopsis multispinosa*, *Lamoha murotoensis*, *Latreillopsis bispinosa*, *L. tetraspinosa*, *Mohola alcocki*, *M. alisae* and *Paromola cuvieri*. This family is often reef-associated and it also occupies benthic habitats within the depth range 38 meters to 700 meters (although some *Paramola cuvieri* have been captured at 1212 meters).

Of the 10 species identified only 2 have larval descriptions: *Homola barbata* (Rice and Provenzano Jr., 1970; Clark and Cuesta, 2015) and *Paromola cuvieri* (Samuelsen, 1976).

The zoeae of this family present an anteriorly directed rostral spine and lateral spines in the carapace, and dorsolateral and posterolateral processes in the abdominal somites.

1. Antennal exopod with 9 long plumose setae; endopod of first maxilliped 5-segmented with 1,1,1,2,5 setae; exopod of first maxilliped with 4 natatory setae

*Homola barbata*

- Antennal exopod with 5 or 6 long setae; endopod of first maxilliped 5-segmented with 1,1,1,2,4 setae; exopod of first maxilliped with 3 natatory setae

*Paromola cuvieri*

## Latreilliidae

The Latreilliidae family has four species in the WIO area distributed by two genera, *Eplumula phalagium*, *Latreillia metanasa*, *L. pennifera* and *L. valida*. This family is benthic, preferring soft substrates and can be found at depths of 700 meters.

The zoeae of this family present an anteriorly directed rostral spine and no lateral spines in the carapace, and abdominal somites without dorsolateral and posterolateral processes.

None of the species identified has larval descriptions.

## Raninidae

The Raninidae family has five species in the WIO area distributed by four subfamilies, Lyreidinae, Notopodinae, Ranininae and Raninoidinae. The Lyreidinae subfamily is represented by one species, *Lyreidus brevifrons*; the Notopodinae subfamily is represented by two species, *Cosmonotus grayii* and *Notopus dorsipes*; the Ranininae subfamily is represented by one species, *Ranina ranina*; the Raninoidinae subfamily is represented by one species, *Raninoides barnardi*. This family, commonly known as frog crabs due to their elongated cephalothorax, consists of reef-associated and borrowing species, preferring sandy substrates.

The zoeae of this family present a ventrally directed rostral spine and a non furcated telson, triangular, with long marginal plumose setae and spines on posterolateral margins.

Of the five species identified, only one has larval description: *Ranina ranina* (Sakai, 1971).

## Aethridae

The Aethridae family has three species in the WIO area, *Actaeomorpha erosa*, *Aethra scruposa* and *A. seychellensis*. This family is reef-associated and can be found at the depth range of 0 meters to 40 meters.

The zoeae of this family have long lateral carapace spines, one-half the length of the width of the carapace and telson usually with 2 or 3 spines on each furca.

None of the species identified has larval descriptions.

## Calappidae

The Calappidae family has 12 species in the WIO area distributed by two genera, *Calappa africana*, *C. gallus*, *C. guerini*, *C. hepatica*, *C. japonica*, *C. lophos*, *C. pustulosa*, *C. woodmasoni*, *Mursia africana*, *M. armata*, *M. cristiata* and *M. flamma*. The genus *Calappa* inhabit sandy and muddy substrates at depths of 30 meters to 380 meters, with most species inhabiting the 40-72 meters range, except for *C. hepatica* which is present in inter-infratidal habitats; while the genus *Mursia* inhabit sandy and muddy substrates at depths of 10 meters to 510 meters, mostly below the 200 meters range.

The zoeae of this family present a ventrally curved rostral spine with pointed spinules along anterior half, furcated telson with 2 outer spines and ventral spines absent on furcal rami and maxilla endopod with 2+5 setae.

Of the 12 species identified only three have larval description: *Calappa gallus*, *C. japonica* (Taishaku and Konishi, 1995) and *C. lophos* (Seridji, 1993; Taishaku and Konishi, 1995).

1. Rostral carapace spine with 6-10 pointed spinules along its anterior half *Calappa gallus*  
Rostral carapace spine with 4-5 pointed spinules along its anterior half 2
2. Endopod of second maxilliped 3-segmented with 1,1,3 setae *Calappa japonica*  
Endopod of second maxilliped 3-segmented with 1,1,4 setae *Calappa lophos*

## Matutidae

The Matutidae family has one species in the WIO area, *Ashtoret lunaris*. This family, commonly known as the moon crabs, is found in sandy or muddy shores, with a preference for seagrass beds, reaching depths of up to 50 meters.

The zoeae of this family do not present an antennal exopod and have a furcated telson armed with dorsal and lateral spines.

The larvae of the species identified has been described, *Ashtoret lunaris* (Seridji, 1993; Taishaku and Konishi, 1995).

## Atelecyclidae

The Atelecyclidae family has one species in the WIO area, *Atelecyclus rotundatus*. This family has benthic and demersal species, with depth ranges from 0 meters to 1200 meters.

The zoeae of this family present an antennal exopod shorter than the protopod, with terminal seate and spines, the carapace presents lateral spines and the furcated telson is armed with dorsal and lateral spines, and the abdominal somites 2 to 4 present posterolateral processes.

The larvae of the species identified has been described, *Atelecyclus rotundatus* (Hong and Ingle, 1987).



## **Cancridae**

The Cancridae family has one species in the WIO area, *Platapistoma seani*. This family is mostly benthic, preferring rocky substrates, the species are found in the depth range of 0 meters to 50 meters, although some species can be found at 1100 meters.

The zoeae of this family present an antennal exopod shorter than the protopod, with terminal seate and spines, the carapace presents lateral spines and the furcated telson is armed with dorsal and lateral spines, and the abdominal somites 3 to 5 present posterolateral processes.

The larvae of the species identified have not been described.

## **Carpiliidae**

The Carpiliidae family has two species in the WIO area, both belonging to the genus *Carpilius*, *C. convexus* and *C. maculatus*. These species inhabit rocky or coralline substrates in the littoral to sublittoral zones (depths of 0-35 meters).

The zoeae of this family present short dorsal and rostral carapace spines and the first abdominal somite with 4 setae.

Both species have larval descriptions: *Carpilius convexus* and *C. maculatus* (Clark *et al.*, 2005).

1. Carapace with 9 pairs of anterodorsal setae and lateral spines absent; endopod of maxillule 2-segmented with 1+4 setae; scaphognathite (maxilla exopod) with 15 marginal setae; coxa of maxilla bilobed with 6+4 setae *Carpilius convexus*  
Carapace with 4 pairs of anterodorsal setae and lateral spines absent; endopod of maxillule 2-segmented with 1+5 setae; scaphognathite (maxilla exopod) with 17 marginal setae; coxa of maxilla bilobed with 7+4 setae *Carpilius maculatus*

## **Corystidae**

The Corystidae family has one species in the WIO area, *Gomezia bicornis*. This family is composed of burrowing crabs, reaching depths of 10 meters and the species identified in the study area is reef-associated.

The zoeae of this family present an antennal exopod shorter than the protopod, with terminal seate and spines, the furcated telson presents dorsal spines and only the second abdominal somite has dorsolateral processes.

The larvae of the species identified have not been described.

## **Dairidae**

The Dairidae family has one species in the WIO area, *Daira perlata*. This family occupies benthic habitats reaching maximum depths of 6 meters. The genus *Daira* is the only one in this family and is considered a living fossil (Busulini, Tessier and Beschin, 2006).

The zoeae of this family present a furcated telson with dorsal and lateral spines on furcal rami, the basis of first maxilliped with 10 setae and maxilla endopod bilobed with 3+3 setae.

The larvae of the species identified have not been described.

## Dorippidae

The Dorippidae family has four species in the WIO area distributed by three genera, *Dorippe frascione*, *D. quadridens*, *Dorippoides midipes* and *Medorippe lanata*. The genus *Dorippe* inhabits benthic areas between 0-73 meters (with *D. quadridens* sometimes reaching depths of 415 meters); *Dorippoides nudipes* between depths of 2-77 meters; and *Medorippe lanata* inhabits muddy detritic areas between 10-250 meters.

The zoeae of this family present long dorsal and rostral carapace spines, telson bifurcated with conspicuously long and unarmed furcal rami, with a constriction in proximal part and strong lateral spines in some cases, and maxilla endopod with 1+3 setae.

Of the four species identified only two have larval descriptions: *Dorippe frascione* (Quintana, 1987) and *Medorippe lanata* (Paula, 1991).

1. Coxal endite of maxillule with 6 setae; coxal endite of maxilla with 3 setae; basal endite of maxilla bilobed with 5+5 setae *Dorippe frascione*  
Coxal endite of maxillule with 5 setae; coxal endite of maxilla with 2 setae; basal endite of maxilla bilobed with 4+4 setae *Medorippe lanata*

## Ethusidae

The Ethusidae family has six species in the WIO area, distributed by two genera, *Ethusa machaera*, *E. spinespina*, *E. zurstrasseni*, *Ethusina challengerii*, *E. longipes* and *E. somalica*. This family occupies benthic habitats from depths of 0 meters to 4000 meters.

The zoeae of this family present long dorsal and rostral carapace spines, telson bifurcated with conspicuously long and unarmed furcal rami, with a constriction in proximal part and strong lateral spines in some cases, and maxilla endopod with 1+5 setae.

None of the species identified has larval descriptions.

## Dairoididae

The Dairoididae family has two species in the WIO area, *Dairoides kusei* and *D. margaritatus*. This family occupies a several habitats: benthic, demersal, some species are reef-associated, others prefer muddy or rocky substrates and has a depth range from 0 meters to 230 meters.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

## Eriphiidae

The Eriphiidae family has three species in WIO area, all belonging to *Eriphia* genus, *E. scabricula*, *E. sebana* and *E. smithii*. These species are intertidal and associated with reefs or rocky substrates.

The zoeae of this family present dorsal and rostral carapace spines approximately the same length, lateral carapace spine present and furcated telson with lateral and dorsal spines on each rami.

All three species have larval descriptions: *Eriphia scabricula* (Clark and Paula, 2003), *E. sebana* and *E. smithii* (Ko, 2005).

1. Ventral margin of carapace without setae *Eriphia scabricula*  
Ventral margin of carapace with 2 small tubercles posteriorly 2

2. Antennal exopod with 3 terminal simple setae
- Antennal exopod with 4 terminal simple setae

*Eriphia sebana*  
*Eriphia smithii*

### Menippidae

The Menippidae family has three species in the WIO area, *Menippe rumphii*, *Myomenippe fornasinii* and *Sphaerozius nitidus*. This family occupies a several habitats: benthic, demersal, some species are reef-associated, others prefer muddy or rocky substrates and has a depth range from 0 meters to 800 meters.

The zoeae of this family present an antennal exopod shorter than the protopod, with terminal setae and spines, the furcated telson presents lateral spines and only the second abdominal somite has dorsolateral processes.

Of the three species identified, only one has larval descriptions: *Sphaerozius nitidus* (Ko, 2005)

### Oziidae

The Oziidae family has four species in the WIO area, distributed by 3 genera, *Epixanthus dentatus*, *E. frontalis*, *Lydia annulipes* and *Ozius rugulosus*.

This family has a varied habitat range, from demersal species to brackish and reef-associated species, within a depth range of 0 meters to 6 meters.

The zoeae of this family present a ventrally curved rostral spine with pointed spinules along anterior half, furcated telson with 2 outer spines and ventral spines absent on furcal rami and maxilla endopod with 3+5 setae.

Of the four species identified, all have larval descriptions: *Lydia annulipes*, *Epixanthus dentatus* (Clark and Paula, 2003), *E. frontalis* (Clark and Paula, 2003; Al-Aidaros, Al-Haj and Kumar, 2014), and *Ozius rugulosus* (Kakati and Nayak, 1977).

- |  |                             |
|--|-----------------------------|
| 1. Basial endite of maxillule with 7 setal processes | <i>Epixanthus dentatus</i>  |
| Basial endite of maxillule with 5 setal processes    | 2                           |
| 2. Coxal endite of maxilla bilobed with 7+4 setae    | <i>Lydia annulipes</i>      |
| Coxal endite of maxilla bilobed with 5+4 setae       | 3                           |
| 3. Exopod of antennule with 2 aesthetascs and 1 seta | <i>Ozius rugulosus</i>      |
| Exopod of antennule with 5 aesthetascs and 1 seta    | <i>Epixanthus frontalis</i> |

### Acidopsidae

The Acidopsidae family has two species in the WIO area distributed by 2 subfamilies, Acidopsinae and Raouliinae. The Acidopsinae subfamily is represented by the species *Parapilumnus pisifer*; the Raouliinae subfamily is represented by the species *Caecopilumnus piroculatus*. This family is mostly benthic in depths ranging from 0 meters to 40 meters.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

### **Chasmocarcinidae**

The Chasmocarcinidae family has one species in the WIO area, *Camatopsis rubida*. This family is benthic in depths ranging from 40 meters to 2000 meters.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

### **Euryplacidae**

The Euryplacidae family has one species in the WIO area, *Eucrate sulcatifrons*. This family is benthic, usually found in sandy or sandy mud substrates, reaching depths of 200 meters.

The zoeae of this family present an antennal exopod well developed, similar in size or longer than protopod, telson furca armed with lateral spines and maxilla endopod bilobed with 3+5 setae.

The larvae of the species identified have not been described.

### **Goneplacidae**

The Goneplacidae family has nine species in the WIO area distributed by six genera, *Carcinoplax ischurodous*, *C. longimanus*, *Entricoplax vestita*, *Goneplax clevai*, *G. rhomboides*, *Ommatocarcinus pulcher*, *Psopheticus crosnieri*, *P. stirdulans* and *Pycnoplax coryphaea*. This family is mostly benthic and demersal with depths ranging from 3 to 800 meters.

The zoeae of this family present an antennal exopod well developed, similar in size or longer than protopod, telson furca armed with dorsal and lateral spines, and posterolateral processes on abdominal somites 2 to 5.

Of the nine species identified only two have larval descriptions: *Carcinoplax longimanus* (Terada, 1984) and *Goneplax rhomboides* (Ingle and Clark, 1983).

1. Coxal endite of maxillule with 7 setae; coxal endite of maxilla bilobed with 1+3 setae

*Carcinoplax longimanus*

- Coxal endite of maxillule with 6 setae; coxal endite of maxilla bilobed with 4+4 setae

*Goneplax rhomboides*

### **Mathildellidae**

The Mathildellidae family has two species in the WIO area, *Beuroisia duhameli* and *Neopilumnoplax heterochir*. This family is benthic with depths ranging from 100 meters to 800 meters.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

### **Hexapodidae**

The Hexapodidae family has two species in the WIO area, *Hexapus stebbing* and *Spirolax spiralis*. This family is benthic with a depth range from 0 meters to 50 meters.

The zoeae of this family present an antennal exopod well developed, similar in size or longer than protopod, and dorsolateral processes only on the second abdominal somite.

Of the 2 species identified, only 1 has larval descriptions: *Spirolax spiralis* (Pereyra Lago, 1988).

### **Leucosiidae**

The Leucosiidae family has 28 species in the WIO area belonging to three subfamilies, Cryptocneminae, Ebaliinae and Leucosiinae. The Cryptocneminae subfamily is represented by two species *Cryptocnemus*

*holdsworthi* and *Leucisca squalina*; the Ebaliinae subfamily is represented by 24 species distributed by 13 genera, *Afrophila punctata*, *Arcania cornuta*, *A. septemspinosa*, *A. undecimspinosa*, *Ebalia agglomus*, *E. barnardi*, *E. glomus*, *E. pondoensis*, *E. tuberculata*, *E. tuberculosa*, *Heteronucia angulata*, *Hiplyra michellinae*, *H. platycheir*, *Lithadia barnardi*, *Lyphira matalensis*, *Myra fugax*, *M. subgranula*, *Nucia speciosa*, *Nursilia dentata*, *Philyra globus*, *P. samia*, *P. scabriuscula*, *Ryphila cancellus* and *Tanaoa pustulosus*; the Leucosiinae subfamily is represented by two species, *Soceulia marmorea* and *Urnalana whitei*. This family occupies a varied range of habitats, from reef-associated species to demersal and benthic species, with a depth range of 1-420 meters.

The zoeae of this family present a non furcated telson and the antennal exopod is absent.

Of the 28 species identified only six have larval descriptions and all belong to the Ebaliinae subfamily: *Arcania septemspinosa*, *A. undecimspinosa*, *Hiplyra platycheir*, *Myra fugax* (Ko, 2000), *Philyra globus* (Krishnan and Kannupandi, 1990b) and *P. scabriuscula* (Rajabai, 1960).

1. Carapace without dorsal spine	2
Carapace with dorsal spine	3
2. Basis of first maxilliped with 8 setae, arranged 2,2,2,2	<i>Hiplyra platycheir</i>
Basis of first maxilliped with 10 setae, arranged 2,2,3,3	<i>Philyra globus</i>
3. Coxal endite of maxillule with 5 setae	4
Coxal endite of maxillule with 6 setae	5
4. Endopod of maxillule 2-segmented with 2+2 setae	<i>Arcania septemspinosa</i>
Endopod of maxillule 2-segmented with 0+4 setae	<i>Myra fugax</i>
5. Endopod of first maxilliped 5-segmented with 2,2,1,2,5 setae	<i>Arcania undecimspinosa</i>
Endopod of first maxilliped 5-segmented with 4,0,1,0,3 setae	<i>Philyra scabriuscula</i>

### Epialtidae

The Epialtide family has 22 species in the WIO area distributed by 13 genera, belonging to 3 subfamilies, Epialtinae, Pisinae and Tychinae. In the subfamily Epialtinae are 11 species distributed by 6 genera, *Acanthonyx dentatus*, *A. quadridentatus*, *A. scutellatus*, *A. undulatus*, *Antilibinia smithii*, *Huenia heraldica*, *Menaethiops delagoae*, *M. fascicularis*, *M. natalensis*, *Menaethius monoceros* and *Xenocarcinus tuberculatus*; in the subfamily Pisinae are 10 species distributed by six genera, *Cyphocarcinus capreolus*, *Doclea muricata*, *Hyastenus convexus*, *H. diacanthus*, *H. spinosus*, *H. uncifer*, *Naxioides hirtus*, *Rochinia natalensis*, *R. pulchra* and *Tiarinia cornigera*; the subfamily Tychinae in the WIO area is only represented by one species *Stilbognathus cervicornis*.

This family occupies a wide range of habitats: subfamily Epialtinae mostly intertidal reaching depths of 290 meters; subfamily Pisinae intertidal, subtidal, with a depth range of 23 meters to 636 meters; subfamilu Tychinae reaching depths of 62 meters.

The zoeae of this family only present two zoeal stages (as all species belonging to the superfamily Majoidea), the antennal exopod is similar in size or longer than protopod and endopod of second maxilliped three-segmented with 1,1,4/6 setae.

Of the 22 species identified only three have larval descriptions: *Huenia heraldica*, *Menaethius monoceros* (Colavite, Santana and Pohle, 2014) and *Doclea muricata* (Krishnan and Kannupandi, 1987).

- |   |                             |
|---|-----------------------------|
| 1. Carapace with dorsal spine                                   | <i>Doclea muricata</i>      |
| Carapace without dorsal spine                                   | 2                           |
| 2. Endopod of first maxilliped 5-segmented with 3,2,1,2,4 setae | <i>Menaethius monoceros</i> |
| Endopod of first maxilliped 5-segmented with 3,2,1,2,5 setae    | <i>Huenia heraldica</i>     |

### Inachidae

The Inachidae family has 22 species in WIO Area, distributed by 12 genera, *Achaeopsis spinulosa*, *Achaeus barnardi*, *A. curvirostris*, *A. lacertosus*, *A. laevioculus*, *A. spinosissimus*, *Camposcia retusa*, *Chorinachus dolichorhynchus*, *Cyrtomaia murrayi*, *Dorhynchus thomsoni*, *Inachus dorsettensis*, *I. guentheri*, *Macropodia falcifera*, *M. formosa*, *M. intermedia*, *M. rostrata*, *Oncinopus neptunus*, *Paratymolus barnardi*, *P. pubescens*, *Platymaia alcocki*, *P. turbynei* and *Sunipea indicus*. This family is found in benthic habitats, mostly in the 0 meters to 200 meters range, although *Dorhynchus thomsoni* has been found at 2080 meters.

The zoeae of this family only present two zoeal stages (as all species belonging to the superfamily Majoidea), the antennal exopod is similar in size or longer than protopod and endopod of second maxilliped three-segmented with 0,1,4 setae.

Of the 22 species identified only three have larval descriptions: *Dorhynchus thomsoni* (Williamson, 1982), *Inachus dorsettensis* (Lebour, 1927; Ingle, 1977) and *Macropodia rostrata* (Ingle, 1982).

- |  |                             |
|--|-----------------------------|
| 1. Endopod of first maxilliped 5-segmented with 3,2,1,2,3 setae                                  | <i>Dorhynchus thomsoni</i>  |
| Endopod of first maxilliped 5-segmented with 3,2,1,2,5 setae                                     | 2                           |
| 2. Distal segment of endopod of maxillule with 4 setae; basis of second maxilliped without setae | <i>Inachus dorsettensis</i> |
| Distal segment of endopod of maxillule with 3 setae; basis of second maxilliped with 1 seta      | <i>Macropodia rostrata</i>  |

### Majidae

The Majidae family has 12 species in the WIO area, distributed by nine genera, *Choniognathus elegans*, *Entomonyx soinosus*, *Eurynome aspera*, *Maja cornuta*, *M. squinado*, *Majella brevipes*, *Micippa philyra*, *M. thalia*, *Prismatopus longispinus*, *P. tosaensis*, *Sakaija africana* and *Schizophrys aspera*. This family occupies various habitats, like benthic, demersal and reefs.

The zoeae of this family only present two zoeal stages (as all species belonging to the superfamily Majoidea), 'majid' seta on inner lateral margin of carapace.

Of the 12 species identified five have larval descriptions: *Eurynome aspera* (Salman, 1982), *Maja squinado* (Lebour, 1927; Guerao *et al.*, 2008), *Micippa philyra* (Ko, 1995b), *M. thalia* (Gore, Scotto and Yang, 1982) and *Schizophrys aspera* (Ghory, 2012).

#### (Genera *Micippa* and *Schizophrys*)

- |  |                           |
|--|---------------------------|
| 1. Antennule with 6 aesthetascs and 1 seta | <i>Schizophrys aspera</i> |
| Antennule with 3 aesthetascs and 1 seta    | 2                         |

- |    |   |                        |
|----|---|------------------------|
| 2. | Antennal spinous process slightly longer than exopod  | <i>Micippa philyra</i> |
|    | Antennal spinous process slightly shorter than exopod | <i>Micippa thalia</i>  |

**(Genera *Eurynome* and *Maja*)**

- |    |   |                        |
|----|---|------------------------|
| 1. | Lateral spines of carapace absent; basis of first maxilliped with 10 setae, arranged<br>2,2,3,3 | <i>Eurynome aspera</i> |
|    | Lateral spines of carapace present; basis of first maxilliped with 9 setae, arranged<br>2,2,2,3 | <i>Maja squinado</i>   |

**Oregoniidae**

The Oregoniidae family has three species in the WIO area, *Pleistacantha moseleyi*, *P. ori* and *P. oryx*. This family is benthic with a depth range from 0 meters to 500 meters.

The zoeae of this family only present two zoeal stages (as all species belonging to the superfamily Majoidea), antennal exopod shorter than protopod and maxilla endopod bilobed.

None of the species identified has larval descriptions.

**Palicidae**

The Palicidae family has three species in the WIO area, *Paliculus kyusyuensis*, *Parapallicus elaniticus* and *Pseudopallicus sexlobatus*. This family, sometimes referred to as stilt crabs, is benthic with a depth range from 0 meters to 800 meters, with some species reaching 1000 meters.

The zoeae of this family present a lateral carapace spine, furcal rami of telson armed with lateral spines and the antennal exopod is absent.

None of the species identified has larval descriptions.

**Parthenopidae**

The Parthenopidae family has three species in the WIO area distributed by two subfamilies, Daldorfiinae and Parthenopinae. The Daldorfiinae subfamily is represented by 1 species, *Daldorfia horrida*; the Parthenopinae subfamily is represented by 2 species, *Enoplolambrus carenatus* and *Lambrachaeus ramifer*. This family is reef-associated with a depth range from 0 meters to 40 meters.

The zoeae of this family present a furcated telson armed with dorsal and lateral spines on each rami, endopod of maxillule with 1+6 setae, maxilla endopod bilobed with 3+5 setae and basis of first maxilliped with 8 setae.

None of the species identified has larval descriptions.

**Pilumnidae**

The Pilumnidae family has 14 species in the WIO area belonging to three subfamilies, Eumodoninae, Pilumninae and Xenophthalmodinae. The Eumodoninae subfamily is represented by two species, *Eumodonus niger* and *Gonatonotus granulatus*; the Pilumninae subfamily is represented by nine species distributed by five genera, *Actumnus setifer*, *Benthipanope indica*, *Eurycarcinus natalensis*, *Pilumnus dofleini*, *P. longicornis*, *P. minutus*, *P. trichophoroides*, *P. vespertilio* and *Serenepilumnus pisifer*; the Xenophthalmodinae subfamily is represented by three species belonging to the genus *Xerophthalmodes*,

*Xerophthalmodes brachyphallus*, *X. dolichophallus* and *X. moebii*. This family includes demersal, benthic and reef-associated species and occurs within a depth range of 0 meters to 33 meters.

The zoeae of this family present a well developed antennal exopod, similar in size or longer than protopod, a furcated telson armed with dorsal and lateral spines and dorsolateral processes on abdominal somites 2 and 3.

Of the 14 species identified, only six have larval descriptions, all belonging to the Pilumninae subfamily: *Actumnus setifer* (Clark and Ng, 2004), *Benthopanope indica* (Ko, 1995a), *Eurycarcinus natalensis*, *Pilumnus longicornis* (Clark and Paula, 2003), *P. minutus* (Ko, 1994) and *P. vespertilio* (Lim and Tan, 1979; Clark and Paula, 2003).

1. Antennule with 3 aesthetascs	2
Antennule with 4 aesthetascs	3
2. Right molar process of mandible with 5 teeth	<i>Benthopanope indica</i>
Right molar process of mandible with 4 teeth	<i>Pilumnus minutus</i>
3. Dorsal carapace spine slightly longer than rostral spine	<i>Pilumnus longicornis</i>
Dorsal carapace spine at least 2 times longer than rostral spine	4
4. Dorsal carapace spine 2 times longer than rostral spine	<i>Actumnus setifer</i>
Dorsal carapace spine 3 times longer than rostral spine	5
5. Third maxilliped present and biramous	<i>Pilumnus vespertilio</i>
Third maxilliped absent	<i>Eurycarcinus natalensis</i>

### **Carcinidae**

The Carcinidae family has one species in the WIO area, *Xaiva mcleayi*. This family includes demersal and benthic species, with a depth range from 0 meters to 200 meters. As part of the Portunoidea superfamily these species are commonly known as swimming crabs.

The zoeae of this family present an antennal exopod shorter than the protopod, with terminal seate and spines, carapace lateral spines are absent and the furcated telson is armed with dorsal and lateral spines, and the abdominal somites 3 to 5 present posterolateral processes.

The larvae of the species identified have not been described.

### **Geryonidae**

The Geryonidae has two species in the WIO area, *Chaceon collettei* and *C. macphersoni*. This family is benthic and is found within the depth range of 200 meters to 2000 meters. As part of the Portunoidea superfamily these species are commonly known as swimming crabs.

The zoeae of this family present a well developed antennal exopod, similar in size or longer than protopod, a furcated telson armed with dorsal and lateral spines and dorsolateral processes on abdominal somites 2 to 4.

None of the species identified has larval descriptions.



### Ovalipidae

The Ovalipidae family has three species in the WIO area, *Ovalipes iridescens*, *O. punctatus* and *O. trimaculata*. This family is benthic and occurs within the 0 meters to 50 meters depth range, although some species occur at 580 meters. As part of the Portunoidea superfamily these species are commonly known as swimming crabs.

The zoeae of this family present a furcated telson with dorsal and lateral spines on furcal rami, the basis of first maxilliped with 10 setae and maxilla endopod bilobed with 3+4 setae.

Of the three species identified, one has larval description: *Ovalipes trimaculata* (Schoeman and Cockcroft, 1996).

### Polybiidae

The Polybiidae family has one species in the WIO area, *Parathranites orientalis*. This family is benthic and occurs within the 70 meters to 600 meters depth range, more commonly found in rocky substrate or pebbles. As part of the Portunoidea superfamily these species are commonly known as swimming crabs.

The zoeae of this family present a furcated telson with dorsal and lateral spines on furcal rami, the basis of first maxilliped with 8 setae and maxilla endopod bilobed with 3+5 setae.

The larvae of the species identified have not been described.

### Portunidae

The Portunidae family has 38 species in the WIO area distributed by six subfamilies, Caphyrinae, Carupinae, Lupocyclusinae, Podophthalminae, Portuninae and Thalamitinae. The Caphyrinae subfamily is represented by five species distributed by three genera, *Caphyra alata*, *C. unidentata*, *coelocarcinus foliatus*, *Lissocarcinus laevis* and *L. orbicularis*; the Carupinae subfamily is represented by one species, *Carupa tenuipes*; the Lupocyclusinae subfamily is represented by one species, *Lupocyclus tugelae*; the Podophthalminae subfamily is represented by one species, *Podophthalmus vigil*; the Portuninae subfamily is represented by 10 species distributed by four genera, *Carupella natalensis*, *Cycloachelous granulatus*, *C. orbicularis*, *Portunus argentatus*, *P. gladiator*, *P. hastatooides*, *P. pelagicus*, *P. sanguinolentus*, *P. segnis* and *Scylla serrata*; the Thalamitinae subfamily is represented by 20 species distributed by two genera, *Charybdis africana*, *C. annulata*, *C. feriata*, *C. hellerii*, *C. natator*, *C. orientalis*, *C. smithii*, *C. variegata*, *Thalamita admete*, *T. bevisi*, *T. bouvieri*, *T. crenata*, *T. danae*, *T. delagoae*, *T. helleri*, *T. integra integra*, *T. picta*, *T. prymna*, *T. sima* and *T. woodmasoni*.

This family is benthic and is found in sandy or muddy substrates, as long as some rocks are near for shelter, these crabs are mostly found in the intertidal zone within the depth range of 0-70 m (although some species have been found at depths of 400m). As part of the Portunoidea superfamily these species are commonly known as swimming crabs.

The zoeae of this family present a furcated telson with dorsal and lateral spines on furcal rami, the basis of first maxilliped with 10 setae and maxilla endopod bilobed with 2+4 setae.

Of the 38 species identified 11 have larval descriptions: *Portunus pelagicus* (Shinkarenko, 1979; Josileen and Menon, 2004), *P. sanguinolentus*, *Scylla serrata* (Naidu, 1955), *Charybdis annulata*, *C. natator*, *C. orientalis*, *C. variegata* (Islam, Shokita and Higa, 2000), *C. feriata* (Motoh and Villaluz, 1976; Fielder, Greenwood and Campell, 1984), *C. hellerii* (Dineen *et al.*, 2001), *Thalamita crenata* (Krishnan and Kannupandi, 1990a) and *T. danae* (Krishnan and Kunnapandi, 1988b).

1. Basial endite of maxillule with 4 setae	<i>Thalamita crenata</i>	
Basial endite of maxillule with 5 or more setae		2
2. Exopod of antenulle with 5 aesthetascs	<i>Thalamita danae</i>	
Exopod of antenulle with 2 or 3 aesthetascs		3
3. Exopod of antenulle with 2 aesthetascs		4
Exopod of antenulle with 3 aesthetascs		6
4. Proximal segment of second maxilliped unarmed	<i>Scylla serrata</i>	
Proximal segment of second maxilliped with one seta		5
5. Basis of first maxilliped with 8 setae	<i>Portunus sanguinolentus</i>	
Basis of first maxilliped with 10 setae	<i>Charybdis helleri</i>	
6. Coxal endite of maxilla bilobed with 3+3 setae		7
Coxal endite of maxilla with 2+3 setae		9
7. Endopod of second maxilliped 4-segmented	<i>Portunus pelagicus</i>	
Endopod of second maxilliped 3-segmented		8
8. Basis of first maxilliped with 10 setae	<i>Charybdis variegata</i>	
Basis of first maxilliped with 12 setae	<i>Charybdis orientalis</i>	
9. Endopod of second maxilliped with 1,1,5 setae	<i>Charybdis annulata</i>	
Endopod of second maxilliped with 1,1,4 setae		10
10. Dorsolateral spines on abdominal somites 2- 3 (proximally and distally directed, respectively)	<i>Charybdis natator</i>	
Pair of lateral hooks on abdominal somites 2-3	<i>Charybdis feriata</i>	

### **Pseudoziidae**

The Pseudoziidae family has one species in the WIO area, *Pseudozius caystrus*. This family is benthic with depths ranging from 0 meters to 800 meters and some species are reef-associated.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

### **Retroplumidae**

The Retroplumidae has one species in the WIO area, *Retropluma planiforma*. This family occupies deep sea habitats.

No larval description has been found, therefore no identifying characteristics of the family can be determined.

### **Tetraliidae**

The Tetraliidae family has four species in the WIO area distributed by two genera, *Tetralia cinctipes*, *T. glaberrima*, *T. rubridactyla* and *Tetraloides nigrifrons*. This family consists of reef-associated

species, all members of this family are obligate associates of cnidarians (Castro, 1997), giving them the common designation of coral crabs.

The zoeae of this family present a furcated telson with dorsal and lateral spines on furcal rami, the basis of first maxilliped with 10 setae and maxilla endopod bilobed with 2+3 setae.

Of the four species identified two have larval descriptions: *Tetralia glaberrima* (Clark and Galil, 1988) and *T. rubridactyla* (Clark and Ng, 2006).

- |   |                              |
|---|------------------------------|
| 1. Endopod of first maxilliped 5-segmented with 2,2,1,2,5 | <i>Tetralia glaberrima</i>   |
| Endopod of first maxilliped 5-segmented with 3,2,1,2,5    | <i>Tetralia rubridactyla</i> |

### Trapeziidae

The Trapeziidae family has 12 species in the WIO area distributed by two genera, *Quadrella boopsis*, *Q. coronata*, *Q. maculosa*, *Q. serenei*, *Trapezia bidentata*, *T. cymodoce*, *T. digitalis*, *T. guttata*, *T. lutea*, *T. richtersi*, *T. rufopunctata* and *T. speciosa*. This family consists of reef-associated species, and like the Tetraliidae all members of this family are obligate associates of cnidarians (Castro, 1997), giving them the common designation of coral crabs. The adults are more often identified by the colour patterns than by morphological characters (Castro, 1997).

The zoeae of this family present an antennal exopod shorter than protopod and a middorsal process on abdominal somite 1.

Of the 12 species identified six have larval descriptions: *Quadrella maculosa*, *Q. serenei*, *Trapezia richtersi* (Clark and Ng, 2006), *T. bidentata*, *T. digitalis* (Al-Aidaros, 1992) and *T. cymodoce* (Clark and Galil, 1988).

- |  |   |
|--|---|
| 1. Ventral margin of carapace without setae  | 2   |
| Ventral margin of carapace with minute denticles   | 4   |
| 2. Dorsal spine of carapace spinulate  | <i>Quadrella maculosa</i>                             |
| Dorsal spine of carapace not spinulate   | 3   |
| 3. Carapace with one pair of lateral spines; maxillule endopod 2-segmented with 1+5 setae; coxa of first maxilliped with one seta        | <i>Trapezia richtersi</i>                             |
| Carapace with 2 pairs of lateral spines; maxillule endopod 2-segmented with 1+6 setae; coxa of first maxilliped without setae            | <i>Quadrella serenei</i>                              |
| 4. Antennule with 4 aesthetascs  | <i>Trapezia cymodoce</i>                              |
| Antennule with 5 aesthetascs   | 5   |
| 5. Prong (fourth process) of telson about twice of length of lateral spine; 3 pairs of inner setae, outer most about 3/4 length of prong | <i>Trapezia bidentata</i>                             |
| Prong (fourth process) of telson less than twice of length of lateral spine; 3 pairs of inner setae, outer most about as long as prong   | <i>Trapezia digitalis</i><br><i>Quadrella serenei</i> |

## Trichopeltariidae

The Trichopeltariidae has one species in the WIO area, *Trichopeltarion glaucus*. This family is benthic with depths ranging from 20 meters to 2000 meters, predominantly in the 70 meters to 120 meters range. No larval description has been found, therefore no identifying characteristics of the family can be determined.

## Panopeidae

The Panopeidae family has one species in the WIO area, *Panopeus africanus*. This family, commonly known as mud crabs, is benthic and usually occurs in muddy substrates, reaching depths of 20 meters. The zoeae of this family present a furcated telson armed with dorsal, ventral and lateral spines and dorsolateral processes on abdominal somites 2 and 3.

The larvae of the species identified has been described, *Panopeus africanus* (Rodríguez and Paula, 1993).

## Xanthidae

The Xanthidae family has 66 species in the WIO area distributed by 11 subfamilies, Actaeinae, Banareiinae, Chlorodiellinae, Cymoinae, Etisinae, Euxanthinae, Kraussiinae, Liomerinae, Polydectinae, Xanthinae and Zosiminae. The Actaeinae subfamily is represented by 13 species distributed by 8 genera, *Actaea polyacantha*, *A. savignii*, *A. spinosissima*, *Actaeodes hirsutissimus*, *A. tomentosus*, *Epiactaea nodulosa*, *Forestiana depressa*, *Gaillardiellus rueppelli*, *Paractaea rebieri*, *P. rufopunctata*, *Psaumis cavipes*, *Pseudoliomera speciosa* and *P. variolosa*; the Banareiinae subfamily is represented by one species, *Banareia parvula*; the Chlorodiellinae subfamily is represented by nine species distributed by five genera, *Chlorodiella laevissima*, *C. nigra*, *Cyclodius obscurus*, *C. unguatus*, *Luniella pugil*, *Phymodius unguatus*, *Pilodius areolatus*, *P. melanospinis* and *P. pilumnoides*; the Cymoinae subfamily is represented by three species, *Cymo andreossyi*, *C. melanodactylus* and *C. quadrilobatus*; the Etisinae subfamily is represented by three species, *Etisus anaglyptus*, *E. electra* and *E. laevimanus*. The Euxanthinae subfamily is represented by three species distributed by three genera, *Hypocolpus diverticulatus*, *Medaeops granulatus*, *M. neglectus* and *Monodaeus tuberculidens*; the Kraussiinae subfamily is represented by one species, *Kraussia rugulosa*; the Liomerinae subfamily is represented by eight species distributed by two genera, *Liomera bella*, *L. cinctimanus*, *L. monticulosa*, *L. rugata*, *L. stimpsonii*, *L. tristis*, *Neoliomera sabaeta* and *N. themisto*; the Polydectinae subfamily is represented by three species, *Lybia leptochelis*, *L. plumosa* and *L. tessellata*; the Xanthinae subfamily is represented by nine species distributed by five genera, *Lachnopodus subacutus*, *Leptodius exaratus*, *L. sanguineus*, *Macromedaeus quinquedentatus*, *M. voeltzkowi*, *Neoxanthias impressus*, *Xanthias lamarckii*, *X. maculatus* and *X. punctatus*; the Zosiminae subfamily is represented by 12 species distributed by seven genera, *Atergatis floridus*, *A. granulatus*, *A. ocyroe*, *A. roseus*, *Atergatopsis obesa*, *A. signata*, *Lophozozymus dodone*, *Paratergatis longimanus*, *Platypodia granulosa*, *Zosimus aeneus*, *Zozymodes cavipes* and *Z. xanthoides*. Species belonging to this family are usually reef-associated species, reaching depths of 50 meters, although most are in the 0 meters to 10 meters range; these species are commonly referred to as mud crabs, pebble crabs or rubble crabs.

The zoeae of this family present a furcated telson with dorsal and lateral spines on furcal rami, the basis of first maxilliped with 10 setae and maxilla endopod bilobed with 3+5 setae.

Of the 66 species identified only nine have larval descriptions: *Actaeodes hirsutissimus*, *A. tomentosus* (Clark and Al-Aidaros, 1996), *Pseudoliomera speciosa* (Clark and Galil, 1998), *Etisus laevimanus* (Suzuki, 1978), *Liomera bella* (Yang and Ko, 2005), *Lybia plumosa*, *Leptodius exaratus*, *Zozymodes xanthoides* (Clark and Paula, 2003) and *Atergatis floridus* (Tanaka and Konishi, 2001).

1. Endopod of second maxilliped 3-segmented with 1,1,5 setae		2
Endopod of second maxilliped 3-segmented with 1,1,6 setae		4
2. Lateral carapace spines short and slightly bent upwards at the tips	<i>Etisus laevimanus</i>	
Lateral carapace spines long and straight		3
3. Antennal exopod with 3 setae (2 terminal, 1 subterminal)	<i>Lybia plumosa</i>	
Antennal exopod with 1 terminal seta	<i>Leptodius exaratus</i>	
4. Coxal endite of maxilla with 5+4 setae	<i>Liomera bella</i>	
Coxal endite of maxilla with 4+4 setae		3
5. Antennule with 4 aesthetascs		6
Antennule with 3 aesthetascs		7
6. Dorsal carapace spine longer than rostral spine covered with small spines	<i>Pseudoliomera speciosa</i>	
Dorsal carapace spine approximately equal in length as rostral spine and unarmed	<i>Zozymodes xanthoides</i>	
7. Rostral carapace spine as long as antennal protopod	<i>Atergatis floridus</i>	
Rostral carapace spine shorter than antennal protopod		8
8. Antennal exopod small with 1 terminal seta	<i>Actaeodes hirsutissimus</i>	
Antennal exopod elongated with 3 terminal unequal setae	<i>Actaeodes tomentosus</i>	

### **Cryptochiridae**

The Cryptochiridae family has two species in the WIO area, *Cryptochirus coralliodytes* and *Hapalocarcinus marsupialis*. This family is reef-associated, living in shallow waters and forming associations with stony corals, causing the formation of galls in the coral structure, earning the common name of gall crabs or coral gall crabs (Johnsson *et al.*, 2006).

The zoeae of this family present pleonal lateral expansions on abdominal somite 4 and a furcated telson armed with lateral spines.

Of the two species, one has larval description: *Hapalocarcinus marsupialis* (Gore, Scotto and Reed, 1983).

### **Gecarcinidae**

The Gecarcinidae family has one species in the WIO area, *Cardisoma carnifex*. This family, known as land crabs, is terrestrial with spawning and larval development occurring in marine habitats.

The zoeae of this family present an antennal exopod shorter than protopod, lateral carapace spines and maxillule endopod with 1+5 setae.

The larvae of the species identified has been described, *Cardisoma carnifex* (Flores, Paula and Dray, 2003).

## Grapsidae

The Grapsidae family has 10 species in the WIO area distributed by five genera, *Geograpsus stormi*, *Grapsus fourmanoiri*, *G. tenuicrustatus*, *Metopograpsus messor*, *M. thukuhar*, *Pachygrapsus minutus*, *P. plicatus*, *Planes major*, *P. marinus* and *P. minutus*. This family is mostly reef-associated, reaching depths of 10 meters (most common range 0-6 meters). The genus *Metopograpsus* is excluded from this key because it does not present antennal exopod and all other species present a reduced antennal exopod. The zoeae of this family present a rectangular telson and a maxilla endopod with 2+2 setae. Of the 10 species identified seven have larval descriptions: *Grapsus fourmanoiri*, *G. tenuicrustatus*, *Metopograpsus messor*, *Pachygrapsus minutus*, *P. plicatus* (Flores, Paula and Dray, 2003), *Planes marinus* (Wear, 1970) and *P. minutus* (Cuesta, González-Gordillo and Rodríguez, 1997).

### (excluding genus *Metopograpsus*)

- |  |                               |
|--|-------------------------------|
| 1. Dorsal carapace spine long  | <i>Planes marinus</i>         |
| Dorsal carapace spine short  | 2                             |
| 2. Lateral carapace spines minute and as small hooked projections          | <i>Planes minutus</i>         |
| Lateral carapace spines absent   | 3                             |
| 3. Coxal endite of maxilla bilobed with 4+5 setae                          | 4                             |
| Coxal endite of maxilla bilobed with 5+4 setae                             | 5                             |
| 4. Telson with 2 posterolateral pairs of spines, the posterior one smaller | <i>Grapsus fourmanoiri</i>    |
| Telson with 2 posterolateral pairs of spines, the posterior one larger     | <i>Grapsus tenuicrustatus</i> |
| 5. Telson with 2 posterolateral pairs of spines of similar size            | <i>Pachygrapsus minutus</i>   |
| Telson with 2 posterolateral pairs of spines, the posterior one larger     | <i>Pachygrapsus plicatus</i>  |

## Percnidae

The Percnidae family has two species in the WIO area, *Percnon guinotae* and *P. planissimum*. This family is benthic and some species are reef-associated, can be found at depths up to 20 meters. The zoeae of this family present a furcated telson armed with lateral spines and the basis of the first maxilliped with 9 setae. None of the species identified has larval descriptions.

## Plagusiidae

The Plagusiidae family has 5 species in the WIO area distributed by 4 genera, *Euchirograpsus polydous*, *Guinusia chabrus*, *Miersiograpsus kingsleyi*, *Plagusia depressa* and *P. squamosa*. This family occupies mostly intertidal and subtidal habitats. The zoeae of this family present a furcated telson armed with lateral spines and the basis of the first maxilliped with 8 setae.

Of the 5 species identified 2 have larval description: *Guinusia chabrus* (Schubart and Cuesta, 2010) and *Plagusia depressa* (Wilson and Gore, 1980).

- |   |                          |
|---|--------------------------|
| 1. Basis of first maxilliped with 8 setae, arranged 2,2,2,2; antennal exopod less than 1/4 length of protopod | <i>Plagusia depressa</i> |
| Basis of first maxilliped with 10 setae, arranged 2,2,3,3 antennal exopod less than 1/6 length of protopod    | <i>Guinusia chabrus</i>  |

### Sesarmidae

The Sesarmidae family has 13 species in the WIO area distributed by seven genera, *Chiromantes eulimene*, *C. ortmanni*, *Neosarmatium africanum*, *N. meinerti*, *N. smithi*, *Parasesarma catenatum*, *P. leptosoma*, *P. plicatum*, *Perisesarma guttatum*, *P. samawati*, *Sarmatium crassum*, *Selatium elongatum* and *Sesarmoides longipes*. This family consists of semi-terrestrial and tree-climbing species (some genera like *Sesarma*, *Metopaulias* and *Geosesarma*, are true terrestrial crabs and do not need to return to the sea for spawning (Schubart, Liu and Cuesta, 2003)) and can be found mainly in mangroves.

The zoeae of this family present an antennal exopod shorter than protopod, lateral carapace spines are absent and maxillule endopod with 1+5 setae.

Of the 13 species identified eight have larval descriptions: *Chiromantes eulimene* (Pereyra Lago, 1993b; Flores, Paula and Dray, 2003; Guerao *et al.*, 2011), *C. ortmanni* (Guerao *et al.*, 2012), *Neosarmatium meinerti* (Pereyra Lago, 1989; Flores, Paula and Dray, 2003), *Parasesarma catenatum* (Pereyra Lago, 1987; Flores, Paula and Dray, 2003), *P. plicatum* (Selvakumar, 1999), *P. leptosoma*, *Sarmatium crassum* (Flores, Paula and Dray, 2003) and *Perisesarma guttatum* (Pereyra Lago, 1993a).

- |   |                              |
|---|------------------------------|
| 1. Antennal exopod with 4 or more setae   | 2                            |
| Antennal exopod with 3 or less setae  | 4                            |
| 2. Antennal exopod with 5 setae   | <i>Parasesarma leptosoma</i> |
| Antennal exopod with 4 setae  | 3                            |
| 3. Antennule with 3 unequal terminal aesthetascs                                  | <i>Sarmatium crassum</i>     |
| Antennule with 5 terminal aesthetascs   | <i>Chiromantes ortmanni</i>  |
| 4. Antennule with 3 aesthetascs   | 5                            |
| Antennule with 4 aesthetascs  | 6                            |
| 5. Coxal endite of maxillule with 6 setae; basis of first maxilliped with 8 setae | <i>Parasesarma catenatum</i> |
| Coxal endite of maxillule with 5 setae; basis of first maxilliped with 10 setae   | <i>Parasesarma plicatum</i>  |
| 6. Antennal exopod with 2 setae   | <i>Perisesarma guttatum</i>  |
| Antennal exopod with 3 setae  | 7                            |
| 7. Coxal endite of first maxilliped with 5 setae                                  | <i>Neosarmatium meinerti</i> |
| Coxal endite of first maxilliped with 6 setae                                     | <i>Chiromantes eulimene</i>  |

## Varunidae

The Varunidae has seven species in the WIO area distributed by three subfamilies, Cyclograpsinae, Gaeticinae and Varuninae. The Cyclograpsinae is represented by three species, *Cyclograpsus punctatus*, *Parahelice balssi* and *Pseudohelice subquadrata*; the Gaeticinae subfamily is represented by one species, *Brankocleistostoma fossulum*; the Varuninae subfamily is represented by three species, *Pseudograpsus elongatus*, *Ptychognathus onyx* and *Varuna litterata*. This family is predominantly found in the intertidal zone, on muddy or rocky substrates.

The zoeae of this family present a furcated unarmed telson and an antennal exopod well developed, similar in size or longer than protopod.

Of the seven species, one has larval descriptions: *Cyclograpsus punctatus* (Fagetti and Campodónico, 1971).

## Camptandriidae

The Camptandriidae family has three species in the WIO area, *Danielella edwardsii*, *Paratyloidiplax algoensis* and *P. blephariskios*. This family is adapted to brackish environments and can be found in the intertidal zone.

The zoeae of this family present an antennal exopod well developed, similar in size or longer than protopod and dorsolateral processes on abdominal somites 2 to 4.

None of the species identified has larval descriptions.

## Dotillidae

The Dotillidae family has two species in the WIO area, *Dotilla fenestrata* and *Lazarocleistostoma dentatum*. This family is found in the intertidal zone, in sandy beaches; the genera *Dotilla* and *Scopimera* live in burrows where at high tides they trap air, forming bubble that allow them to breathe, thus earning them the common name sand bubbler crabs.

The zoeae of this family are very diverse and as such it is very difficult to determine defining characters. Of the 2 species identified, 1 has larval descriptions: *Dotilla fenestrata* (Paula *et al.*, no date).

## Macrophthalmidae

The Macrophthalmidae family has eight species in the WIO area belonging to two subfamilies, Ilyograpsinae and Macrophthalminae. The Ilyograpsinae subfamily is represented by two species *Ilyograpsus paludicola* and *I. rhizophorae*; the Macrophthalminae subfamily is represented by six species distributed by 3 genera, *Chaenostoma boscii*, *C. sinuspersici*, *Macrophthalmus convexus*, *M. depressus*, *M. grandidieri* and *Venitus latreillei*. This family is benthic, reaching depths of 0 meters to 5 meters and prefers brackish habitats.

The zoeae of this family present a furcated unarmed telson, an antennal exopod well developed, similar in size or longer than protopod and pleonal expansions on abdominal somite 5.

Of the eight species identified five have larval descriptions: *Ilyograpsus paludicola* (Flores, Paula and Dray, 2003), *Chaenostoma boscii*, *Macrophthalmus depressus*, *M. grandidieri* (Paula *et al.*, no date) and *Venitus latreillei* (Selvakumar, Ajmalkhan and Natarajan, 1988).

1. Dorsal carapace spine absent  
Dorsal carapace spine present

*Ilyograpsus paludicola*  
2



- |  |                                   |   |
|--|-----------------------------------|---|
| 2. Lateral carapace spine present  | <i>Venitus latreillei</i>         |   |
| Lateral carapace spine absent  |                                   | 3 |
| 3. Denticles present in abdominal somite 4   | <i>Macrophthalmus depressus</i>   |   |
| Denticles present in abdominal somites 4 and 5   |                                   | 4 |
| 4. Dorsal carapace spine with half the length of carapace; posterolateral margin of carapace slightly crenulated; antennal exopod with 1/3 length of protopod                |                                   |   |
|  | <i>Chaenostoma boscii</i>         |   |
| Dorsal carapace spine with 5/8 length of carapace; posterolateral margin of carapace with a small tooth and slightly crenulated; antennal exopod with 1/4 length of protopod |                                   |   |
|  | <i>Macrophthalmus grandidieri</i> |   |

### Ocypodidae

The Ocypodidae family has 11 species in the WIO area belonging to two subfamilies, Ocypodinae and Ucinae. The Ocypodinae subfamily is represented by four species belonging to the genus *Ocypode*, *Ocypode ceratophthalmus*, *O. cordimana*, *O. madagascariensis* and *O. rydery*; the Ucinae subfamily is represented by 7 species belonging to the genus *Uca*, *Uca annulipes*, *U. chlorophthalmus*, *U. crassipes*, *U. hesperiae*, *U. inversa*, *U. urvillei* and *U. vocans*. This family is semi-terrestrial and can be found in mangroves, salt marshes, sandy or muddy beaches, mostly in the intertidal zone.

The zoeae of this family are very diverse and as such it is very difficult to determine defining characters. Of the 11 species identified, six have larval descriptions: *Ocypode ceratophthalmus*, *O. cordimana* (Jiang *et al.*, 2014), *Uca annulipes*, *U. chlorophthalmus*, *U. urvillei* and *U. vocans* (Paula *et al.*, no date).

- |   |                                |   |
|---|--------------------------------|---|
| 1. Lateral carapace spine present   |                                | 2 |
| Lateral carapace spine absent   |                                | 3 |
| 2. Abdominal somite 1 naked   | <i>Ocypode cordimana</i>       |   |
| Abdominal somite 1 with rounded posterolateral processes  | <i>Ocypode ceratophthalmus</i> |   |
| 3. Denticles absent on abdominal somites 4 and 5  |                                | 4 |
| Denticles present on abdominal somites 4 and 5  |                                | 5 |
| 4. Dorsal spine of carapace 1/3 length of carapace; rostral spine 1/3 bigger than antenna; telson forks with innumerable small spines and denticles; basis of first maxilliped with 8 setae (1,2,3,2) | <i>Uca annulipes</i>           |   |
| Dorsal spine of carapace 1/2 length of carapace; rostral spine double the length of antenna; telson forks with innumerable small spines; basis of first maxilliped with 9 setae (2,2,3,2)             | <i>Uca urvillei</i>            |   |

5. Rostral spine with 1/4 length of antenna; dorsal spine of carapace with 1/3 length of carapace; mandible incisive process with 3 teeth projections and 1 subterminal tooth; basis of first maxilliped with 9 setae (2,2,3,2)

*Uca vocans*

Rostral spine with 3/4 length of antenna; dorsal spine of carapace with 1/6 length of carapace; mandible incisive process with 5 teeth projections and 2 subterminal teeth; basis of first maxilliped with 10 setae (3,2,3,2)

*Uca chlorophthalmus*

### Pinnotheridae

The Pinnotheridae family has five species in the WIO area distributed by 4 genera, *Pinnixa penultipedalis*, *Osttracotheres tridacnae*, *Pinnotheres dofleini*, *P. globosus* and *Xanthasia murigera*. The species in this family are soft-bodied crabs that are commensal, most living in the mantle of bivalves. Their small size and roundish shape earned them the common name pea crabs.

The zoea of this family present a furcated telson and all abdominal somites do not have any posterolateral processes.

None of the species identified has larval descriptions.

### Hymenosomatidae

The Hymenosomatidae family has six species in WIO area, distributed by five genera, *Elamena mathoei*, *Halicarcinus planatus*, *Hymenosoma geometricum*, *H. orbiculare*, *Neorhynchoplax bovis* and *Trigonoplax unguiformis*. This family occupies a diverse range of habitats, from estuarine to subtidal reaching depths of 270 meters.

The zoeae of this family present a reduced antennal exopod and an elongated trapezoidal telson, wider anteriorly.

Of the six species identified four have larval descriptions: *Elamena mathoei* (Krishnan and Kannupandi, 1988a), *Halicarcinus planatus* (Boschi, Scelzo and Goldstein, 1969), *Hymenosoma orbiculare* and *Trigonoplax unguiformis* (Dornelas, Paula and Macia, 2003).

- |   |   |                                |
|---|---|--------------------------------|
| 1. Dorsal carapace spine absent                             | 2 |                                |
| Dorsal carapace spine present                               | 3 |                                |
| 2. Basial endite of first maxilliped with 9 setae (2,2,2,3) |   | <i>Halicarcinus planatus</i>   |
| Basial endite of first maxilliped with 10 setae (2,2,3,3)   |   | <i>Elamena mathoei</i>         |
| 3. Coxal endite of maxilla with 1 seta                      |   | <i>Trigonoplax unguiformis</i> |
| Coxal endite of maxilla with 2 setae                        |   | <i>Hymenosoma orbiculare</i>   |

## Discussion and conclusion

Four hundred and thirty species of Brachyuran crabs have been identified as inhabiting the WIO region, of which 114 (about 27%) have larval descriptions available. Many species included in Kensley (1981) needed their names updated as they were no longer taxonomically valid; the online database WoRMS (<http://www.marinespecies.org>) was used to update and correct those names.

There is still much descriptive work required for these keys to become more complete of the diversity of the brachyuran fauna that inhabits the WIO area. As stated before, most of the species in this geographic area are either undescribed or the descriptions available do not meet the standard requirements defined by Clark *et al.* (1998).

The most representative groups present in the WIO region are the families Xanthidae (66 species present), Portunidae (38 species present) and the superfamily Ocypodoidea (24 species present), which comprises of the families Camptandriidae (3 species present), Dotillidae (2 species present), Macrophthalmidae (8 species present) and Ocypodidae (11 species present). Some families, such as Raninidae, Aethridae or Panopeidae, do not have an identification key as none of the species identified in the area has larval descriptions or only one of the species has a description available. The families Cycloporippidae, Dairoididae, Acidopsidae, Chasmocarcinidae, Mathildellidae, Pseudoziidae, Retroplumidae and Trichopeltariidae are not included in the identification key of families because no larval description was found for these families, not allowing determining the identifying characteristics of the families.

Many challenges came up when developing the identification key for families. For example, separating the families Portunidae, Parthenopidae, Polybiidae; Aethridae; Ovalipidae; Xanthidae and Dairidae was particularly hard and was only possible using the setation of segments of the first maxilliped and of the maxilla (Clark and Cuesta, 2015). Within the families there is also a high level of intraspecific similarity and again the necessity to use characters that require dissection was the only way to differentiate between species. This is a concern in families that have a high percentage of undescribed species, as it increases the probability of mistaking a described species for an undescribed one.

The identification key of families does not reflect taxonomic groupings; however, the individual family keys are organized taxonomically according to Ng *et al.* (2008).

These keys should be used with caution as only 27% of the species that are present in the WIO region have larval descriptions and because only the first Zoal stage was considered.

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# **Appendix A**

**List of Brachyuran species in the Western Indian Ocean**

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Cyclodorippoidea	Cyclodorippidae	Cyclodorippinae	<i>Corycodus decorus</i> Tavares, 1993
Cyclodorippoidea	Cyclodorippidae	Cyclodorippinae	<i>Corycodus disjunctipes</i> (Stebbing, 1910)
Cyclodorippoidea	Cyclodorippidae	Cyclodorippinae	<i>Corycodus merweae</i> Tavares, 1993
Cyclodorippoidea	Cyclodorippidae	Xeinostomatinae	<i>Xeinostoma eucheir</i> Stebbing, 1920
Cyclodorippoidea	Cymonomidae		<i>Cymonomus mainbaza</i> Ahyong, 2014
Cyclodorippoidea	Cymonomidae		<i>Cymonomus trifurcus</i> Stebbing, 1920
Cyclodorippoidea	Cymonomidae		<i>Cymonomus valdivae</i> (Lankester, 1903)
Dromioidea	Dromiidae	Dromiinae	<i>Ascidiophilus caphyraeformis</i> Richters, 1880
Dromioidea	Dromiidae	Dromiinae	<i>Barnardromia bituberculata</i> (Stebbing, 1920)
Dromioidea	Dromiidae	Dromiinae	<i>Barnardromia hirsutimana</i> (Kensley & Buxton, 1984)
Dromioidea	Dromiidae	Dromiinae	<i>Conchoecetes artificiosus</i> (Fabricius, 1798)
Dromioidea	Dromiidae	Dromiinae	<i>Cryptodromia bullifera</i> (Alcock, 1900)
Dromioidea	Dromiidae	Dromiinae	<i>Cryptodromia fallax</i> (Latreille in Milberts, 1812)
Dromioidea	Dromiidae	Dromiinae	<i>Dromia dormia</i> (Linnaeus, 1763)
Dromioidea	Dromiidae	Dromiinae	<i>Dromidia aegibotus</i> Barnard, 1946
Dromioidea	Dromiidae	Dromiinae	<i>Dromidia cornuta</i> (Barnard, 1946)
Dromioidea	Dromiidae	Dromiinae	<i>Dromidia dissothrix</i> Barnard, 1946
Dromioidea	Dromiidae	Dromiinae	<i>Dromidia hirsutissima</i> Lamarck, 1818
Dromioidea	Dromiidae	Dromiinae	<i>Dromidia lepidota</i> (Barnard, 1946)
Dromioidea	Dromiidae	Dromiinae	<i>Eudromidia frontalis</i> (Henderson, 1888)
Dromioidea	Dromiidae	Dromiinae	<i>Eudromidia hendersoni</i> (Stebbing, 1921)
Dromioidea	Dromiidae	Dromiinae	<i>Exodromidia spinosa</i> (Studer, 1883)
Dromioidea	Dromiidae	Dromiinae	<i>Exodromidia spinosissima</i> (Kensley, 1977)
Dromioidea	Dromiidae	Dromiinae	<i>Hemisphaerodromia monodous</i> (Stebbing, 1918)
Dromioidea	Dromiidae	Dromiinae	<i>Lauridromia dehaani</i> (Rathbun, 1923)
Dromioidea	Dromiidae	Dromiinae	<i>Lauridromia intermedia</i> (Laurie, 1906)
Dromioidea	Dromiidae	Dromiinae	<i>Lewindromia unidentata</i> (Rüppell, 1830)
Dromioidea	Dromiidae	Dromiinae	<i>Metadromia wilsoni</i> (Fulton & Grant, 1902)
Dromioidea	Dromiidae	Dromiinae	<i>Platydromia spongiosa</i> (Stimpson, 1858)

(Continua)

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Dromioidea	Dromiidae	Dromiinae	<i>Pseudodromia cacuminis</i> Kensley, 1980
Dromioidea	Dromiidae	Dromiinae	<i>Pseudodromia latens</i> Stimpson, 1858
Dromioidea	Dromiidae	Dromiinae	<i>Pseudodromia rotunda</i> (MacLeay, 1838)
Dromioidea	Dromiidae	Dromiinae	<i>Pseudodromia trepida</i> Kensley, 1978
Dromioidea	Dromiidae	Dromiinae	<i>Speodromia platyarthrodes</i> (Stebbing, 1905)
Dromioidea	Dromiidae	Dromiinae	<i>Tumidodromia dormia</i> (Linnaeus, 1763)
Dromioidea	Dynomenidae		<i>Dynomene pilumnoides</i> Alcock, 1900
Homolodromioidea	Homolodromiidae		<i>Homolodromia bouvieri</i> Doflein, 1904
Homoloidea	Homolidae		<i>Homola barbata</i> (Fabricius, 1793)
Homoloidea	Homolidae		<i>Homola orientalis</i> Henderson, 1888
Homoloidea	Homolidae		<i>Homolochunia valdiviae</i> Doflein, 1904
Homoloidea	Homolidae		<i>Ihlopsiopsis multispinosa</i> (Ihle, 1912)
Homoloidea	Homolidae		<i>Lamoha murotoensis</i> (Sakai, 1979)
Homoloidea	Homolidae		<i>Latreillopsiopsis bispinosa</i> Henderson, 1888
Homoloidea	Homolidae		<i>Latreillopsiopsis tetraspinosa</i> Dai & Chen, 1980
Homoloidea	Homolidae		<i>Moloha alcocki</i> (Stebbing, 1920)
Homoloidea	Homolidae		<i>Moloha alisae</i> Guinot & Richer de Forges, 1995
Homoloidea	Homolidae		<i>Paromola cuvieri</i> (Risso, 1816)
Homoloidea	Latreilliidae		<i>Eplumula phalangium</i> (De Haan, 1839)
Homoloidea	Latreilliidae		<i>Latreillia metanesa</i> Williams, 1982
Homoloidea	Latreilliidae		<i>Latreillia pennifera</i> Alcock, 1900
Homoloidea	Latreilliidae		<i>Latreillia valida</i> De Haan, 1839
Raninoidea	Raninidae	Lyreidinae	<i>Lyreidus brevifrons</i> Sakai, 1937
Raninoidea	Raninidae	Notopodinae	<i>Cosmonotus grayii</i> Adams in Belcher, 1848
Raninoidea	Raninidae	Notopodinae	<i>Notopus dorsipes</i> (Linnaeus, 1758)
Raninoidea	Raninidae	Ranininae	<i>Ranina ranina</i> (Linnaeus, 1758)
Raninoidea	Raninidae	Raninoidinae	<i>Raninoides barnardi</i> Sakai, 1974
Aethroidea	Aethridae		<i>Actaeomorpha erosa</i> Miers, 1877
Aethroidea	Aethridae		<i>Aethra scruposa</i> (Linnaeus, 1764)

(Continua)

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Aethroidea	Aethridae		<i>Aethra seychellensis</i> Takeda, 1975
Calappoidea	Calappidae		<i>Calappa africana</i> Lai & Ng, 2006
Calappoidea	Calappidae		<i>Calappa gallus</i> (Herbst, 1803)
Calappoidea	Calappidae		<i>Calappa guerini</i> Brito Capello, 1871
Calappoidea	Calappidae		<i>Calappa hepatica</i> (Linnaeus, 1758)
Calappoidea	Calappidae		<i>Calappa japonica</i> Ortmann, 1892
Calappoidea	Calappidae		<i>Calappa lophos</i> (Herbst, 1782)
Calappoidea	Calappidae		<i>Calappa pustulosa</i> Alcock, 1896
Calappoidea	Calappidae		<i>Calappa woodmasoni</i> Alcock, 1896
Calappoidea	Calappidae		<i>Mursia africana</i> Galil, 1993
Calappoidea	Calappidae		<i>Mursia armata</i> de Haan, 1837
Calappoidea	Calappidae		<i>Mursia cristiata</i> H. Milne-Edwards, 1837
Calappoidea	Calappidae		<i>Mursia flamma</i> Galil, 1993
Calappoidea	Matutidae		<i>Ashtoret lunaris</i> (Forskål, 1775)
Cancroidea	Atelecyclidae		<i>Atelecyclus rotundatus</i> (Olivi, 1792)
Cancroidea	Cancridae		<i>Platepistoma seani</i> Davie & Ng, 2012
Carpilioidea	Carpiliidae		<i>Carpilius convexus</i> (Forskål, 1775)
Carpilioidea	Carpiliidae		<i>Carpilius maculatus</i> (Linnaeus, 1758)
Corystoidea	Corystidae		<i>Gomezia bicornis</i> Gray 1831
Dairoidea	Dairidae		<i>Daira perlata</i> (Herbst, 1790)
Dorippoidea	Dorippidae		<i>Dorippe frascone</i> (Herbst, 1785)
Dorippoidea	Dorippidae		<i>Dorippe quadridens</i> (Fabricius, 1793)
Dorippoidea	Dorippidae		<i>Dorippoides nudipes</i> Manning & Holthuis, 1986
Dorippoidea	Dorippidae		<i>Medorippe lanata</i> (Linnaeus, 1767)
Dorippoidea	Ethusidae		<i>Ethusa machaera</i> Castro, 2005
Dorippoidea	Ethusidae		<i>Ethusa sinespina</i> Kensley, 1969
Dorippoidea	Ethusidae		<i>Ethusa zurstrasseni</i> Doflein, 1969
Dorippoidea	Ethusidae		<i>Ethusina challengerii</i> (Miers, 1886)
Dorippoidea	Ethusidae		<i>Ethusina longipes</i> Chen, 1987

(Continua)

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Dorippoidea	Ethusidae		<i>Ethusina somalica</i> (Doflein, 1904)
Eriphioidea	Dairoididae		<i>Dairoides kusei</i> (Sakai, 1938)
Eriphioidea	Dairoididae		<i>Dairoides margaritatus</i> Stebbing, 1920
Eriphioidea	Eriphiidae		<i>Eriphia scabricula</i> Dana, 1852
Eriphioidea	Eriphiidae		<i>Eriphia sebana</i> (Shaw & Nodder, 1803)
Eriphioidea	Eriphiidae		<i>Eriphia smithii</i> MacLeay, 1838
Eriphioidea	Menippidae		<i>Menippe rumphii</i> (Fabricius, 1798)
Eriphioidea	Menippidae		<i>Myomenippe fornasinii</i> (Bianconi, 1851)
Eriphioidea	Menippidae		<i>Sphaerozius nitidus</i> Stimpson, 1858
Eriphioidea	Oziidae		<i>Epixanthus dentatus</i> (White, 1848)
Eriphioidea	Oziidae		<i>Epixanthus frontalis</i> (H.Milne-Edwards, 1834)
Eriphioidea	Oziidae		<i>Lydia annulipes</i> (H.Milne-Edwards, 1834)
Eriphioidea	Oziidae		<i>Ozius rugulosus</i> Stimpson, 1858
Goneplacoidea	Acidopsidae	Acidopsinae	<i>Parapilumnus pisifer</i> (MacLeay, 1838)
Goneplacoidea	Acidopsidae	Raouliinae	<i>Caecopilumnus piroculatus</i> (Rathburn, 1911)
Goneplacoidea	Chasmocarcinidae	Chasmocarcininae	<i>Camatopsis rubida</i> Alcock & Anderson, 1899
Goneplacoidea	Euryplacidae		<i>Eucrate sulcatifrons</i> (Stimpson, 1858)
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Carcinoplax ischurodous</i> (Stebbing, 1923)
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Carcinoplax longimanus</i> (de Haan, 1833)
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Entricoplax vestita</i> (de Haan, 1835)
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Goneplax clevai</i> Guinot & Castro, 2007
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Goneplax rhomboides</i> (Linnaeus, 1758)
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Ommatocarcinus pulcher</i> Barnard, 1950
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Psopheticus crosnieri</i> Guinot, 1990
Hexapodoidea	Goneplacidae	Goneplacinae	<i>Psopheticus stridulans</i> Wood-Mason, 1892
Goneplacoidea	Goneplacidae	Goneplacinae	<i>Pycnoplax coryphaea</i> Castro, 2012
Goneplacoidea	Mathildellidae		<i>Beuroisia duhameli</i> Guinot & Richer de Forges, 1981
Goneplacoidea	Mathildellidae		<i>Neopilumnoplax heterochir</i> (Studer, 1883)
Hexapodoidea	Hexapodidae		<i>Hexapus stebbingi</i> Barnard, 1947

(Continua)

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Hexapodoidea	Hexapodidae		<i>Spiroplax spiralis</i> (Barnard, 1950)
Leucosioidea	Leucosiidae	Cryptocneminae	<i>Cryptocnemus holdsworthi</i> Miers, 1877
Leucosioidea	Leucosiidae	Cryptocneminae	<i>Leucisca squalina</i> (MacLeay, 1838)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Afrophila punctata</i> (Bell, 1855)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Arcania cornuta</i> (MacGilchrist, 1905)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Arcania septemspinosa</i> (Fabricius, 1787)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Arcania undecimspinosa</i> de Haan, 1841
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ebalia agglomus</i> Barnard, 1955
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ebalia barnardi</i> Stebbing, 1914
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ebalia glomus</i> Stebbing, 1921
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ebalia pondoensis</i> Barnard, 1955
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ebalia tuberculata</i> Miers, 1881
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ebalia tuberculosa</i> (A.Milne-Edwards, 1873)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Heteronucia angulata</i> Barnard, 1946
Leucosioidea	Leucosiidae	Ebaliinae	<i>Hiplyra michellinae</i> Galil, 2009
Leucosioidea	Leucosiidae	Ebaliinae	<i>Hiplyra platycheir</i> (de Haan, 1841)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Lithadia barnardi</i> Stebbing, 1920
Leucosioidea	Leucosiidae	Ebaliinae	<i>Lyphira natalensis</i> Galil, 2009
Leucosioidea	Leucosiidae	Ebaliinae	<i>Myra fugax</i> (Fabricius, 1798)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Myra subgranulata</i> Kossman, 1877
Leucosioidea	Leucosiidae	Ebaliinae	<i>Nucia speciosa</i> Dana, 1852
Leucosioidea	Leucosiidae	Ebaliinae	<i>Nursilia dentata</i> Bell, 1855
Leucosioidea	Leucosiidae	Ebaliinae	<i>Philyra globus</i> (Fabricius, 1775)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Philyra samia</i> Galil, 2009
Leucosioidea	Leucosiidae	Ebaliinae	<i>Philyra scabriuscula</i> (Fabricius, 1798)
Leucosioidea	Leucosiidae	Ebaliinae	<i>Ryphila cancellus</i> Galil, 2009
Leucosioidea	Leucosiidae	Ebaliinae	<i>Tanaoa pustulosus</i> (Wood-Mason in Wood-Mason & Alcock, 1891)
Leucosioidea	Leucosiidae	Leucosiinae	<i>Soceulia marmorea</i> (Bell, 1855)
Leucosioidea	Leucosiidae	Leucosiinae	<i>Urnalana whitei</i> (Bell, 1955)

(Continua)

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Majoidea	Epialtidae	Epialtinae	<i>Acanthonyx dentatus</i> H.Milne-Edwards, 1834
Majoidea	Epialtidae	Epialtinae	<i>Acanthonyx quadridentatus</i> Krauss, 1843
Majoidea	Epialtidae	Epialtinae	<i>Acanthonyx scutellatus</i> MacLeay, 1838
Majoidea	Epialtidae	Epialtinae	<i>Acanthonyx undulatus</i> Barnard, 1947
Majoidea	Epialtidae	Epialtinae	<i>Antilibinia smithii</i> MacLeay, 1838
Majoidea	Epialtidae	Epialtinae	<i>Huenia heraldica</i> (de Haan, 1837)
Majoidea	Epialtidae	Epialtinae	<i>Menaethiops delagoae</i> Barnard, 1955
Majoidea	Epialtidae	Epialtinae	<i>Menaethiops fascicularis</i> (Krauss, 1843)
Majoidea	Epialtidae	Epialtinae	<i>Menaethiops natalensis</i> Barnard, 1955
Majoidea	Epialtidae	Epialtinae	<i>Menaethius monoceros</i> (Latreille, 1825)
Majoidea	Epialtidae	Epialtinae	<i>Xenocarcinus tuberculatus</i> White, 1847
Majoidea	Epialtidae	Pisinae	<i>Cyphocarcinus capreolus</i> (Paul'son,1875)
Majoidea	Epialtidae	Pisinae	<i>Doclea muricata</i> (Herbst, 1788)
Majoidea	Epialtidae	Pisinae	<i>Hyastenus convexus</i> Miers, 1884
Majoidea	Epialtidae	Pisinae	<i>Hyastenus diacanthus</i> (de Haan, 1839)
Majoidea	Epialtidae	Pisinae	<i>Hyastenus spinosus</i> A.Milne-Edwards, 1872
Majoidea	Epialtidae	Pisinae	<i>Hyastenus uncifer</i> Calman, 1900
Majoidea	Epialtidae	Pisinae	<i>Naxioides hirtus</i> A.Milne-Edwards, 1865
Majoidea	Epialtidae	Pisinae	<i>Rochinia natalensis</i> Kensley, 1977
Majoidea	Epialtidae	Pisinae	<i>Rochinia pulchra</i> (Miers, 1886)
Majoidea	Epialtidae	Pisinae	<i>Tiarinia cornigera</i> (Latreille, 1825)
Majoidea	Epialtidae	Tychinae	<i>Stilbognathus cervicornis</i> (Herbst, 1803)
Majoidea	Inachidae		<i>Achaeopsis spinulosa</i> Stimpson,1857
Majoidea	Inachidae		<i>Achaeus barnardi</i> Griffin, 1968
Majoidea	Inachidae		<i>Achaeus curvirostris</i> (A.Milne-Edwards, 1873)
Majoidea	Inachidae		<i>Achaeus lacertosus</i> Stimpson, 1858
Majoidea	Inachidae		<i>Achaeus laeviculis</i> Miers, 1884
Majoidea	Inachidae		<i>Achaeus spinosissimus</i> Griffin, 1968
Majoidea	Inachidae		<i>Camposcia retusa</i> (Latreille, 1829)

(Continua)



**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Majoidea	Inachidae		<i>Chorinachus dolichorhynchus</i> (Alcock & Anderson, 1894)
Majoidea	Inachidae		<i>Cyrtomaia murrayi</i> Miers, 1885
Majoidea	Inachidae		<i>Dorhynchus thomsoni</i> Thomson, 1873
Majoidea	Inachidae		<i>Inachus dorsettensis</i> (Pennant, 1777)
Majoidea	Inachidae		<i>Inachus guentheri</i> (Miers, 1879)
Majoidea	Inachidae		<i>Macropodia falcifera</i> (Stimpson, 1858)
Majoidea	Inachidae		<i>Macropodia formosa</i> Rathbun, 1911
Majoidea	Inachidae		<i>Macropodia intermedia</i> Bouvier, 1940
Majoidea	Inachidae		<i>Macropodia rostrata</i> (Linnaeus, 1761)
Majoidea	Inachidae		<i>Oncinopus neptunus</i> Adams & White, 1848
Majoidea	Inachidae		<i>Paratymolus barnardi</i> Loh & Ng, 1999
Majoidea	Inachidae		<i>Paratymolus pubescens</i> Miers, 1879
Majoidea	Inachidae		<i>Platymaia alcocki</i> Rathbun, 1918
Majoidea	Inachidae		<i>Platymaia turbynei</i> Stebbing, 1902
Majoidea	Inachidae		<i>Sunipea indicus</i> (Alcock, 1895)
Majoidea	Majidae	Majinae	<i>Choniognathus elegans</i> (Stebbing, 1921)
Majoidea	Majidae	Majinae	<i>Entomonox spinosus</i> Miers, 1884
Majoidea	Majidae	Majinae	<i>Eurynome aspera</i> (Pennant, 1777)
Majoidea	Majidae	Majinae	<i>Maja cornuta</i> (Linnaeus, 1758)
Majoidea	Majidae	Majinae	<i>Maja squinado</i> (Herbst, 1788)
Majoidea	Majidae	Majinae	<i>Majella brevipes</i> Ortmann, 1893
Majoidea	Majidae	Majinae	<i>Micippa philyra</i> (Herbst, 1803)
Majoidea	Majidae	Majinae	<i>Micippa thalia</i> (Herbst, 1803)
Majoidea	Majidae	Majinae	<i>Prismatopus longispinus</i> (de Haan, 1839)
Majoidea	Majidae	Majinae	<i>Prismatopus tosaensis</i> (Sakai, 1969)
Majoidea	Majidae	Majinae	<i>Sakaija africana</i> (Griffin & Tranter, 1986)
Majoidea	Majidae	Majinae	<i>Schizophrys aspera</i> (H.Milne-Edwards, 1834)
Majoidea	Oregoniidae	Pleistacanthinae	<i>Pleistacantha moseleyi</i> (Miers, 1886)
Majoidea	Oregoniidae	Pleistacanthinae	<i>Pleistacantha ori</i> Ahyong & Ng, 2007

(Continua)

**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Majoidea	Oregoniidae	Pleistacanthinae	<i>Pleistacantha oryx</i> Ortmann, 1893
Palicoidea	Palicidae		<i>Paliculus kyusyuensis</i> (Yokoya, 1933)
Palicoidea	Palicidae		<i>Parapalicus elaniticus</i> (Holthuis, 1977)
Palicoidea	Palicidae		<i>Pseudopalicus sexlobatus</i> (Kensley, 1969)
Parthenopoidea	Parthenopidae	Daldorfiinae	<i>Daldorfia horrida</i> (Linnaeus, 1758)
Parthenopoidea	Parthenopidae	Parthenopinae	<i>Enoplolambrus carenatus</i> (H. Milne-Edwards, 1834)
Parthenopoidea	Parthenopidae	Parthenopinae	<i>Lambrachaeus ramifer</i> Alcock, 1895
Pilumnoidea	Pilumnidae	Eumodoninae	<i>Eumedonus niger</i> H.Milne-Edwards, 1834
Pilumnoidea	Pilumnidae	Eumodoninae	<i>Gonatonotus granulosis</i> (MacGilchrist, 1905)
Pilumnoidea	Pilumnidae	Pilumninae	<i>Actumnus setifer</i> (de Haan, 1835)
Pilumnoidea	Pilumnidae	Pilumninae	<i>Benthopanope indica</i> (de Man, 1887)
Pilumnoidea	Pilumnidae	Pilumninae	<i>Eurycarcinus natalensis</i> (Krauss, 1843)
Pilumnoidea	Pilumnidae	Pilumninae	<i>Pilumnus dofleini</i> Blass, 1933
Pilumnoidea	Pilumnidae	Pilumninae	<i>Pilumnus longicornis</i> Hilgendorf, 1878
Pilumnoidea	Pilumnidae	Pilumninae	<i>Pilumnus minutus</i> de Haan, 1835
Pilumnoidea	Pilumnidae	Pilumninae	<i>Pilumnus trichophoroides</i> de Man, 1895
Pilumnoidea	Pilumnidae	Pilumninae	<i>Pilumnus vespertilio</i> (Fabricius, 1793)
Pilumnoidea	Pilumnidae	Pilumninae	<i>Serenepilumnus pisifer</i> (MacLeay, 1838)
Pilumnoidea	Pilumnidae	Xenophthalmodinae	<i>Xenophthalmodes brachyphallus</i> Barnard, 1955
Pilumnoidea	Pilumnidae	Xenophthalmodinae	<i>Xenophthalmodes dolichophallus</i> Tesch, 1918
Pilumnoidea	Pilumnidae	Xenophthalmodinae	<i>Xenophthalmodes moebii</i> Richters, 1880
Portunoidea	Carcinidae	Carcininae	<i>Xaiva mcleayi</i> (Barnard, 1947)
Portunoidea	Geryonidae	Geryoninae	<i>Chaceon collettei</i> Manning, 1992
Portunoidea	Geryonidae	Geryoninae	<i>Chaceon macphersoni</i> (Manning & Holthuis, 1988)
Portunoidea	Ovalipidae		<i>Ovalipes iridescens</i> (Miers, 1885)
Portunoidea	Ovalipidae		<i>Ovalipes punctatus</i> (de Haan, 1833)
Portunoidea	Ovalipidae		<i>Ovalipes trimaculatus</i> (de Haan, 1833)
Portunoidea	Polybiidae		<i>Parathranites orientalis</i> (Miers, 1886)
Portunoidea	Portunidae	Caphyrinae	<i>Caphyra alata</i> Richters, 1880

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Superfamily	Family	Subfamily	Species
Portunoidea	Portunidae	Caphyrinae	<i>Caphyra unidentata</i> Lenz, 1910
Portunoidea	Portunidae	Caphyrinae	<i>Coelocarcinus foliatus</i> Edmonson, 1930
Portunoidea	Portunidae	Caphyrinae	<i>Lissocarcinus laevis</i> Miers, 1886
Portunoidea	Portunidae	Caphyrinae	<i>Lissocarcinus orbicularis</i> Dana, 1852
Portunoidea	Portunidae	Carupinae	<i>Carupa tenuipes</i> Dana; 1852
Portunoidea	Portunidae	Lupocyclinae	<i>Lupocyclus tugelae</i> Barnard, 1950
Portunoidea	Portunidae	Podophthalminae	<i>Podophthalmus vigil</i> (Fabricius, 1798)
Portunoidea	Portunidae	Portuninae	<i>Carupella natalensis</i> Lenz & Strunck, 1914
Portunoidea	Portunidae	Portuninae	<i>Cycloachelous granulatus</i> (H.Milne-Edwards, 1834)
Portunoidea	Portunidae	Portuninae	<i>Cycloachelous orbicularis</i> (Richters, 1880)
Portunoidea	Portunidae	Portuninae	<i>Portunus argentatus</i> (A.Milne-Edwards, 1861)
Portunoidea	Portunidae	Portuninae	<i>Portunus gladiator</i> Fabricius, 1798
Portunoidea	Portunidae	Portuninae	<i>Portunus hastatoides</i> Fabricius, 1798
Portunoidea	Portunidae	Portuninae	<i>Portunus pelagicus</i> (Linnaeus, 1758)
Portunoidea	Portunidae	Portuninae	<i>Portunus sanguinolentus</i> (Herbst, 1783)
Portunoidea	Portunidae	Portuninae	<i>Portunus segnis</i> (Forskål, 1775)
Portunoidea	Portunidae	Portuninae	<i>Scylla serrata</i> (Forskål, 1775)
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis africana</i> Shen, 1935
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis annulata</i> (Fabricius, 1798)
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis feriata</i> (Linnaeus, 1758)
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis hellerii</i> (A.Milne-Edwards, 1867)
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis natator</i> (Herbst, 1794)
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis orientalis</i> Dana, 1852
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis smithii</i> MacLeay, 1838
Portunoidea	Portunidae	Thalamitinae	<i>Charybdis variegata</i> (Fabricius, 1798)
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita admete</i> (Herbst, 1803)
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita bevisi</i> (Stebbing, 1921)
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita bouvieri</i> Nobili, 1906
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita crenata</i> Rüppell, 1830

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Superfamily	Family	Subfamily	Species
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita danae</i> Stimpson, 1858
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita delagoae</i> Barnard, 1950
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita helleri</i> Hoffmann, 1874
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita integra integra</i> Dana, 1852
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita picta</i> Stimpson, 1858
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita prymna</i> (Herbst, 1803)
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita sima</i> H.Milne-Edwards, 1834
Portunoidea	Portunidae	Thalamitinae	<i>Thalamita woodmasoni</i> Alcock, 1899
Pseudozioidea	Pseudoziidae		<i>Pseudozius caystrus</i> (Adams & White, 1849)
Retroplumoidea	Retroplumidae		<i>Retropluma planiforma</i> Kensley, 1969
Trapezioidea	Tetraliidae		<i>Tetralia cinctipes</i> Paul'son, 1875
Trapezioidea	Tetraliidae		<i>Tetralia glaberrima</i> (Herbst, 1790)
Trapezioidea	Tetraliidae		<i>Tetralia rubridactyla</i> Garth, 1971
Trapezioidea	Tetraliidae		<i>Tetraloides nigrifrons</i> (Dana, 1852)
Trapezioidea	Trapeziidae	Quadrellinae	<i>Quadrella boopsis</i> Alcock, 1898
Trapezioidea	Trapeziidae	Quadrellinae	<i>Quadrella coronata</i> Dana, 1852
Trapezioidea	Trapeziidae	Quadrellinae	<i>Quadrella maculosa</i> Alcock, 1898
Trapezioidea	Trapeziidae	Quadrellinae	<i>Quadrella serenei</i> Galil, 1986
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia bidentata</i> (Forskål, 1775)
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia cymodoce</i> (Herbst, 1801)
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia digitalis</i> Latreille, 1828
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia guttata</i> Rüppell, 1830
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia lutea</i> Castro, 1997
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia richtersi</i> Galil & Lewinsohn, 1983
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia rufopunctata</i> (Herbst, 1799)
Trapezioidea	Trapeziidae	Trapeziinae	<i>Trapezia speciosa</i> Dana, 1852
Trichopeltarioidea	Trichopeltariidae		<i>Trichopeltarion glaucus</i> (Alcock & Anderson, 1899)
Xanthoidea	Panopeidae	Panopeinae	<i>Panopeus africanus</i> A.Milne-Edwards, 1867
Xanthoidea	Xanthidae	Actaeinae	<i>Actaea polyacantha</i> (Heller, 1861)

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Superfamily	Family	Subfamily	Species
Xanthoidea	Xanthidae	Actaeinae	<i>Actaea savignii</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Actaeinae	<i>Actaea spinosissima</i> Borradaile, 1902
Xanthoidea	Xanthidae	Actaeinae	<i>Actaeodes hirsutissimus</i> (Rüppell, 1830)
Xanthoidea	Xanthidae	Actaeinae	<i>Actaeodes tomentosus</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Actaeinae	<i>Epiactaea nodulosa</i> (White, 1848)
Xanthoidea	Xanthidae	Actaeinae	<i>Forestiana depressa</i> (White, 1848)
Xanthoidea	Xanthidae	Actaeinae	<i>Gaillardiiellus rueppelli</i> (Krauss, 1843)
Xanthoidea	Xanthidae	Actaeinae	<i>Paractaea rebieri</i> Guinot, 1969
Xanthoidea	Xanthidae	Actaeinae	<i>Paractaea rufopunctata</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Actaeinae	<i>Psaumis cavipes</i> (Dana, 1852)
Xanthoidea	Xanthidae	Actaeinae	<i>Pseudoliomera speciosa</i> (Dana, 1852)
Xanthoidea	Xanthidae	Actaeinae	<i>Pseudoliomera variolosa</i> (Borradaile, 1902)
Xanthoidea	Xanthidae	Banareinae	<i>Banareia parvula</i> (Krauss, 1843)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Chlorodiella laevissima</i> (Dana, 1852)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Chlorodiella nigra</i> (Forskål, 1775)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Cyclodius obscurus</i> (Hombron & Jacquinot, 1846)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Cyclodius ungulatus</i> (H. Milne Edwards, 1834)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Luniella pugil</i> (Dana, 1852)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Phymodius ungulatus</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Pilodius areolatus</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Pilodius melanospinis</i> (Rathbun, 1911)
Xanthoidea	Xanthidae	Chlorodiellinae	<i>Pilodius pilumnoides</i> (White, 1848)
Xanthoidea	Xanthidae	Cymoinae	<i>Cymo andreossyi</i> (Audouin, 1826)
Xanthoidea	Xanthidae	Cymoinae	<i>Cymo melanodactylus</i> Dana, 1852
Xanthoidea	Xanthidae	Cymoinae	<i>Cymo quadrilobatus</i> Miers, 1884
Xanthoidea	Xanthidae	Etisinae	<i>Etisus anaglyptus</i> H. Milne-Edwards, 1834
Xanthoidea	Xanthidae	Etisinae	<i>Etisus electra</i> (Herbst, 1801)
Xanthoidea	Xanthidae	Etisinae	<i>Etisus laevimanus</i> Randall, 1840
Xanthoidea	Xanthidae	Euxanthinae	<i>Hypocolpus diverticulatus</i> (Strahl, 1861)

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**List of Brachyuran species in the Western Indian Ocean**

Superfamily	Family	Subfamily	Species
Xanthoidea	Xanthidae	Euxanthinae	<i>Medaeops granulosus</i> (Haswell, 1882)
Xanthoidea	Xanthidae	Euxanthinae	<i>Medaeops neglectus</i> (Balss, 1922)
Xanthoidea	Xanthidae	Euxanthinae	<i>Monodaeus tuberculidens</i> (Rathbun, 1911)
Xanthoidea	Xanthidae	Kraussiinae	<i>Kraussia rugulosa</i> (Krauss, 1843)
Xanthoidea	Xanthidae	Liomerinae	<i>Liomera bella</i> (Dana, 1852)
Xanthoidea	Xanthidae	Liomerinae	<i>Liomera cinctimanus</i> (White, 1847)
Xanthoidea	Xanthidae	Liomerinae	<i>Liomera monticulosa</i> (A.Milne-Edwards, 1973)
Xanthoidea	Xanthidae	Liomerinae	<i>Liomera rugata</i> (H. Milne Edwards, 1834)
Xanthoidea	Xanthidae	Liomerinae	<i>Liomera stimpsonii</i> (A. Milne-Edwards, 1865)
Xanthoidea	Xanthidae	Liomerinae	<i>Liomera tristis</i> (Dana, 1852)
Xanthoidea	Xanthidae	Liomerinae	<i>Neoliomera sabaea</i> (Nobili, 1906)
Xanthoidea	Xanthidae	Liomerinae	<i>Neoliomera themisto</i> (de Man, 1889)
Xanthoidea	Xanthidae	Polydectinae	<i>Lybia leptochelis</i> (Zehntner, 1894)
Xanthoidea	Xanthidae	Polydectinae	<i>Lybia plumosa</i> Barnard, 1946
Xanthoidea	Xanthidae	Polydectinae	<i>Lybia tessellata</i> (Latreille in Milbert, 1812)
Xanthoidea	Xanthidae	Xanthinae	<i>Lachnopodus subacutus</i> (Stimpson, 1858)
Xanthoidea	Xanthidae	Xanthinae	<i>Leptodius exaratus</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Xanthinae	<i>Leptodius sanguineus</i> (H. Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Xanthinae	<i>Macromedaeus quinquedentatus</i> (Krauss, 1843)
Xanthoidea	Xanthidae	Xanthinae	<i>Macromedaeus voeltzkowi</i> (Lenz, 1905)
Xanthoidea	Xanthidae	Xanthinae	<i>Neoxanthias impressus</i> (Latreille in Milbert, 1812)
Xanthoidea	Xanthidae	Xanthinae	<i>Xanthias lamarckii</i> (H.Milne-Edwards, 1834)
Xanthoidea	Xanthidae	Xanthinae	<i>Xanthias maculatus</i> Sakai, 1961
Xanthoidea	Xanthidae	Xanthinae	<i>Xanthias punctatus</i> (H.Milne-Edwards, 1934)
Xanthoidea	Xanthidae	Zosiminae	<i>Atergatis floridus</i> (Linnaeus, 1767)
Xanthoidea	Xanthidae	Zosiminae	<i>Atergatis granulatus</i> de Man, 1889
Xanthoidea	Xanthidae	Zosiminae	<i>Atergatis ocyroe</i> (Herbst, 1801)
Xanthoidea	Xanthidae	Zosiminae	<i>Atergatis roseus</i> (Rüppell, 1830)
Xanthoidea	Xanthidae	Zosiminae	<i>Atergatopsis obesa</i> (A. Milne-Edwards, 1865)

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Superfamily	Family	Subfamily	Species
Xanthoidea	Xanthidae	Zosiminae	<i>Atergatopsis signata</i> (Adams & White, 1849)
Xanthoidea	Xanthidae	Zosiminae	<i>Lophozozymus dodone</i> (Herbst, 1801)
Xanthoidea	Xanthidae	Zosiminae	<i>Paratergatis longimanus</i> Sakai, 1965
Xanthoidea	Xanthidae	Zosiminae	<i>Platypodia granulosa</i> (Rüppell, 1830)
Xanthoidea	Xanthidae	Zosiminae	<i>Zosimus aeneus</i> (Linnaeus, 1758)
Xanthoidea	Xanthidae	Zosiminae	<i>Zozymodes cavipes</i> (Dana, 1852)
Xanthoidea	Xanthidae	Zosiminae	<i>Zozymodes xanthoides</i> (Krauss, 1843)
Cryptochiroidea	Cryptochiridae		<i>Cryptochirus coralliodytes</i> Heller, 1861
Cryptochiroidea	Cryptochiridae		<i>Hapalocarcinus marsupialis</i> Stimpson, 1859
Grapsoidea	Gecarcinidae		<i>Cardisoma carnifex</i> (Herbst, 1796)
Grapsoidea	Grapsidae		<i>Geograpsus stormi</i> de Man, 1895
Grapsoidea	Grapsidae		<i>Grapsus fourmanoiri</i> Crosnier, 1965
Grapsoidea	Grapsidae		<i>Grapsus tenuicrustatus</i> (Herbst, 1783)
Grapsoidea	Grapsidae		<i>Metopograpsus messor</i> (Forskål, 1775)
Grapsoidea	Grapsidae		<i>Metopograpsus thukuhar</i> (Owen, 1839)
Grapsoidea	Grapsidae		<i>Pachygrapsus minutus</i> A.Milne-Edwards, 1873
Grapsoidea	Grapsidae		<i>Pachygrapsus plicatus</i> (H.Milne-Edwards, 1837)
Grapsoidea	Grapsidae		<i>Planes major</i> (MacLeay, 1838)
Grapsoidea	Grapsidae		<i>Planes marinus</i> Rathbun, 1914
Grapsoidea	Grapsidae		<i>Planes minutus</i> (Linnaeus, 1758)
Grapsoidea	Percnidae		<i>Percnon guinotae</i> Crosnier, 1965
Grapsoidea	Percnidae		<i>Percnon planissimum</i> (Herbst, 1804)
Grapsoidea	Plagusiidae		<i>Euchirograpsus polyodous</i> (Stebbing, 1921)
Grapsoidea	Plagusiidae		<i>Guinusia chabrui</i> (Linnaeus, 1758)
Grapsoidea	Plagusiidae		<i>Miersiograpsus kingsleyi</i> (Miers, 1885)
Grapsoidea	Plagusiidae		<i>Plagusia depressa</i> (Fabricius, 1775)
Grapsoidea	Plagusiidae		<i>Plagusia squamosa</i> (Herbst, 1790)
Grapsoidea	Sesarmidae		<i>Chiromantes eulimene</i> (de Man, 1897)
Grapsoidea	Sesarmidae		<i>Chiromantes ortmanni</i> (Crosnier, 1965)

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Grapsoidea	Sesarmidae		<i>Neosarmatium africanum</i> Ragonieri, Fratini & Schubart, 2012
Grapsoidea	Sesarmidae		<i>Neosarmatium meinerti</i> (de Man, 1887)
Grapsoidea	Sesarmidae		<i>Neosarmatium smithi</i> (H.Milne-Edwards, 1853)
Grapsoidea	Sesarmidae		<i>Parasesarma catenatum</i> (Ortmann, 1897)
Grapsoidea	Sesarmidae		<i>Parasesarma leptosoma</i> (Hilgendorf, 1869)
Grapsoidea	Sesarmidae		<i>Parasesarma plicatum</i> (Latreille, 1803)
Grapsoidea	Sesarmidae		<i>Perisesarma guttatum</i> (A.Milne-Edwards, 1869)
Grapsoidea	Sesarmidae		<i>Perisesarma samawati</i> Gillikin & Schubart, 2004
Grapsoidea	Sesarmidae		<i>Sarmatium crassum</i> Dana, 1851
Grapsoidea	Sesarmidae		<i>Selatium elongatum</i> (A.Milne-Edwards, 1869)
Grapsoidea	Sesarmidae		<i>Sesarmoides longipes</i> (Krauss, 1843)
Grapsoidea	Varunidae	Cyclograpsinae	<i>Cyclograpsus punctatus</i> H.Milne-Edwards, 1937
Grapsoidea	Varunidae	Cyclograpsinae	<i>Parahelice balsi</i> (K. Sakai, Türkay & Yang, 2006)
Grapsoidea	Varunidae	Cyclograpsinae	<i>Pseudohelice subquadrata</i> (Dana, 1851)
Grapsoidea	Varunidae	Gaeticinae	<i>Brankocleistostoma fossulum</i> (Barnard, 1955)
Grapsoidea	Varunidae	Varuninae	<i>Pseudograpsus elongatus</i> (A.Milne-Edwards, 1873)
Grapsoidea	Varunidae	Varuninae	<i>Ptychognathus onyx</i> Alcock, 1900
Grapsoidea	Varunidae	Varuninae	<i>Varuna litterata</i> (Fabricius, 1798)
Ocypodoidea	Camptandriidae		<i>Danielella edwardsii</i> (MacLeay, 1838)
Ocypodoidea	Camptandriidae		<i>Paratyloidiplax algoensis</i> (Barnard, 1954)
Ocypodoidea	Camptandriidae		<i>Paratyloidiplax blephariskios</i> (Stebbing, 1924)
Ocypodoidea	Dotillidae		<i>Dotilla fenestrata</i> Hilgendorf, 1869
Ocypodoidea	Dotillidae		<i>Lazarocleistostoma dentatum</i> (Tesch, 1918)
Ocypodoidea	Macrophthalmidae	Ilyograpsinae	<i>Ilyograpsus paludicola</i> (Rathbun, 1909)
Ocypodoidea	Macrophthalmidae	Ilyograpsinae	<i>Ilyograpsus rhizophorae</i> Barnard, 1955
Ocypodoidea	Macrophthalmidae	Macrophthalminae	<i>Chaenostoma boscii</i> (Audouin, 1826)
Ocypodoidea	Macrophthalmidae	Macrophthalminae	<i>Chaenostoma sinuspersici</i> (Naderloo & Türkay, 2011)
Ocypodoidea	Macrophthalmidae	Macrophthalminae	<i>Macrophthalmus convexus</i> Stimpson, 1858
Ocypodoidea	Macrophthalmidae	Macrophthalminae	<i>Macrophthalmus depressus</i> Stimpson, 1859

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Superfamily	Family	Subfamily	Species
Ocypodoidea	Macrophthalmidae	Macrophthalminae	<i>Macrophthalmus grandidieri</i> A.Milne-Edwards, 1867
Ocypodoidea	Macrophthalmidae	Macrophthalminae	<i>Venitus latreillei</i> (Desmarest, 1822)
Ocypodoidea	Ocypodidae	Ocypodinae	<i>Ocypode ceratophthalmus</i> (Pallas, 1772)
Ocypodoidea	Ocypodidae	Ocypodinae	<i>Ocypode cordimana</i> Latreille, 1818
Ocypodoidea	Ocypodidae	Ocypodinae	<i>Ocypode madagascariensis</i> Crosnier, 1965
Ocypodoidea	Ocypodidae	Ocypodinae	<i>Ocypode ryderi</i> Kingsley, 1880
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca annulipes</i> (H.Milne-Edwards, 1837)
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca chlorophthalmus</i> (H. Milne Edwards, 1837)
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca crassipes</i> (White, 1847)
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca hesperiae</i> Crane, 1975
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca inversa</i> (Hoffman, 1874)
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca urvillei</i> (H.Milne-Edwards, 1852)
Ocypodoidea	Ocypodidae	Ucinae	<i>Uca vocans</i> (Linnaeus, 1758)
Pinnotheroidea	Pinnotheridae	Pinnothereliinae	<i>Pinnixa penultipedalis</i> Stimpson, 1859
Pinnotheroidea	Pinnotheridae	Pinnotherinae	<i>Ostracotheres tridacnae</i> (Rüppell, 1830)
Pinnotheroidea	Pinnotheridae	Pinnotherinae	<i>Pinnotheres dofleini</i> Lenz, 1915
Pinnotheroidea	Pinnotheridae	Pinnotherinae	<i>Pinnotheres globosus</i> Hombron & Jacquinot, 1847
Pinnotheroidea	Pinnotheridae	Pinnotherinae	<i>Xanthasia murigera</i> White, 1847
Hymenosomatoidea	Hymenosomatidae	Hymenosomatinae	<i>Elamena mathoei</i> (Desmarest, 1823)
Hymenosomatoidea	Hymenosomatidae	Hymenosomatinae	<i>Halicarcinus planatus</i> (Fabricius, 1775)
Hymenosomatoidea	Hymenosomatidae	Hymenosomatinae	<i>Hymenosoma geometricum</i> Stimpson, 1858
Hymenosomatoidea	Hymenosomatidae	Hymenosomatinae	<i>Hymenosoma orbiculare</i> Desmarest, 1823
Hymenosomatoidea	Hymenosomatidae	Hymenosomatinae	<i>Neorhynchoplax bovis</i> (Barnard, 1946)
Hymenosomatoidea	Hymenosomatidae	Hymenosomatinae	<i>Trigonoplax unguiformis</i> (de Haan, 1839)