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Crustacean Fauna of Iskenderun Bay: A Review of Nearly a Century of Studies

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Abstract

Iskenderun Bay, located in the northeastern Levantine Sea, is a biologically diverse coastal system exposed to urbanisation, industrial activities, fisheries, port infrastructure, and the introduction of alien species. This review compiles and synthesises published information on the crustacean fauna of Iskenderun Bay based on studies conducted since the 1930s. A total of 56 scientific publications, including taxonomic studies, species inventories, benthic community investigations, ecological assessments, fisheries studies, and reports of alien species, were evaluated. Records were included when they directly referred to Iskenderun Bay or when the study area explicitly encompassed the bay. A total of 256 crustacean species larger than 0.5 mm, representing ten taxonomic orders, were recorded. Amphipoda was the most species-rich order (104 species), followed closely by Decapoda (101 species). The remaining species were distributed among Isopoda (24 species), Cumacea (8 species), Balanomorpha and Mysida (5 species each), Stomatopoda (4 species), Tanaidacea (3 species), and Scalpellomorpha and Leptostraca (1 species each). Of these, 34 were reported as alien species, accounting for approximately 13% of the total crustacean fauna. Decapoda constituted the largest component of the alien species records, with 30 species. The results are a species richness based on the literature and not a direct estimate of the current abundance or distribution, due to differences in sampling effort, habitat coverage, geographical extent and taxonomic resolution of the reviewed studies. This synthesis provides a regional baseline for future taxonomic, ecological and biodiversity studies of crustaceans in Iskenderun Bay and emphasizes the need for standardised, long-term monitoring programmes.

Keywords: Iskenderun Bay; crustacean fauna; biodiversity; alien species.

Introduction

Iskenderun Bay is a semi-enclosed coastal system located in the northeastern Levantine Basin of the eastern Mediterranean. Its geographical position, hydrographic characteristics and proximity to the Suez Canal make the bay an important area for studying marine biodiversity, species dispersal and biogeographical change. At the same time, the bay is exposed to various anthropogenic pressures, including industrial activities, port operations, fisheries, coastal settlements and land-based pollution. Industrial contamination has been detected in several coastal areas of the bay, with some stations showing distinct pollution signatures associated

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with factory-related inputs (Yücel & Çam, 2021). Land-based nutrient inputs have also been reported to influence the physicochemical conditions and phytoplankton dynamics of coastal waters, particularly in nearshore areas (Polat, 2002). In addition, historical changes in river discharge and sedimentation indicate that human activities have influenced the environmental development of the bay over long time scales (Spezzaferri et al., 2000).

The biological structure of the eastern Mediterranean has been substantially modified since the opening of the Suez Canal. The canal created a pathway for the movement of Red Sea and Indo-Pacific organisms into the Mediterranean, resulting in the establishment of numerous alien species, especially in the eastern Mediterranean subregion. This process is generally referred to as Lessepsian migration or Erythraean migration and is regarded as a major biogeographical process in the Mediterranean Sea (Zakaria, 2015). The eastern Mediterranean contains a particularly high proportion of thermophilic non-indigenous species, and crustaceans, molluscs and fishes are among the taxonomic groups in which alien species are especially well represented (Zenetos et al., 2010). In addition to migration through the Suez Canal, maritime transport, including the movement of organisms through ballast water and ship-associated vectors, may contribute to the introduction and spread of alien species (Streftaris et al., 2005).

Crustaceans also have ecological and economic importance as components of marine food webs and fisheries. They may act as consumers, detritivores, predators and prey, and they constitute important food items for commercially and ecologically significant fish species. In Iskenderun Bay, fishes such as lionfish have been reported to consume crustaceans, including shrimps, indicating that crustaceans contribute to predator–prey interactions in the bay's benthic and demersal food webs (Demirci & Demirhan, 2022). Penaeid and other commercially important shrimp species are also associated with regional fisheries and may be affected by environmental contamination. Microplastics have been detected in commercially important shrimp species from the northeastern Mediterranean, including species collected from Iskenderun Bay, demonstrating both the exposure of crustaceans to marine pollutants and the potential for human exposure through seafood consumption (Yücel & Kılıç, 2025). Recent research has additionally identified localized metal accumulation in green tiger shrimp from Iskenderun Bay, emphasizing the need to consider the bay as a potential contamination hotspot in assessments of crustacean health and seafood safety (Göçer et al., 2026).

Despite their ecological, biogeographical and economic importance, information on the crustacean fauna of Iskenderun Bay remains fragmented across taxonomic, faunistic, ecological, fisheries and biogeographical studies. Earlier investigations generally focused on particular taxonomic groups or habitats, whereas more recent studies have increasingly addressed community-level distribution patterns, biological invasions and environmental pressures. Direct comparisons among these studies are often difficult because of differences in sampling design, gear type, station distribution, depth range, taxonomic resolution and habitat classification. A comprehensive synthesis is therefore needed to integrate the available records and establish a reliable baseline for future research.

In this study, data from 56 scientific publications covering approximately a century of research are synthesized to evaluate the crustacean fauna of Iskenderun Bay. The recorded species are assessed in terms of taxonomic composition, habitat preference, depth distribution and biogeographical origin, with particular emphasis on alien. This synthesis provides a reference framework for future taxonomic revisions, biodiversity assessments, ecological monitoring and the detection of long-term changes in benthic communities of the eastern Mediterranean.

Materials and Methods

Iskenderun Bay is surrounded by densely populated coastal areas, industrial facilities, port infrastructure, agricultural land and fishing grounds. Its coastal morphology includes a variety of natural and artificial habitats such as soft-bottom areas (Mutlu 2002; 2015; Özcan et al.,

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2008; 2010b), rocky shores (Bakır et al., 2007; Özcan et al., 2010a; İnandı et al., 2014; Ergüden et al., 2021; Özcan & Özcan, 2025), bivalve beds (Doğan et al., 2008), vegetated habitats (Çevik et al., 2012), port structures (Şen et al., 2010) and shallow coastal zones (Sezgin et al., 2007; Türeli & Leba, 2023; Alkan & Özcan, 2025).
The area shown in Figure 1 was used in this study. Only records from sampling stations located in this designated area of Iskenderun Bay were considered. Some studies covered a larger geographical area than Iskenderun Bay, but only the Crustacea species reported from stations within the boundaries specified were included in the list in Table 1 (Kocataş & Katağan, 1978; Çınar et al., 2008).

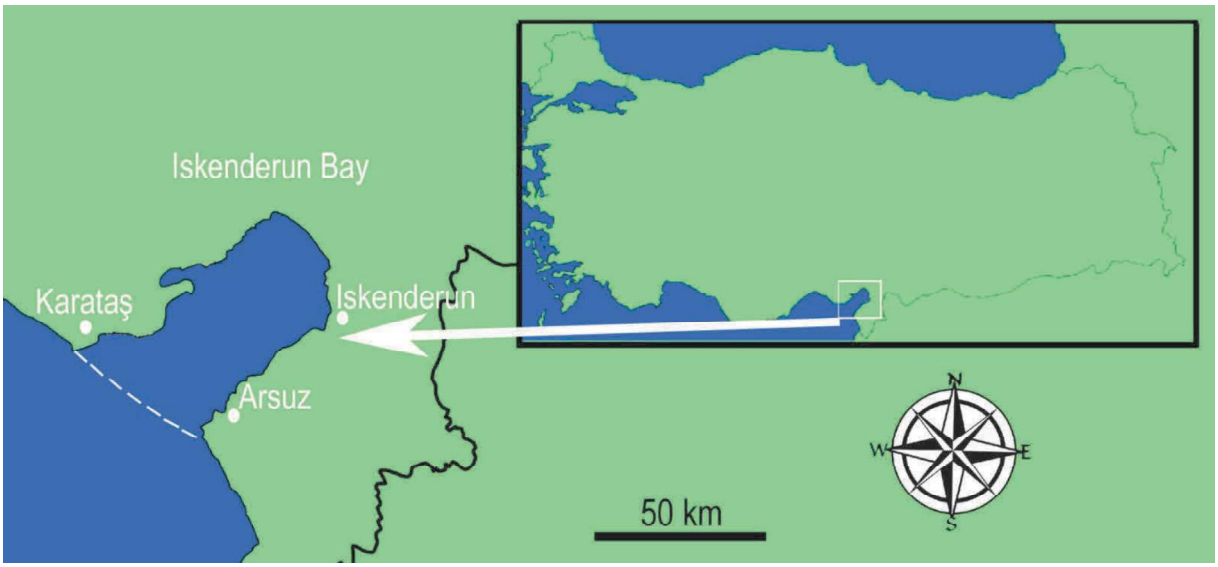


Figure 1. Map of the study area. The dashed line between Karataş and Arsuz in the right panel delineates the geographical boundary applied for the inclusion of species records in this review.

A comprehensive literature search was conducted across open-access scientific publications, conference proceedings, and research project reports documenting Crustacea species in Iskenderun Bay. This review covers taxonomic studies, species inventories, benthic community studies, ecological assessment, fisheries research and reports on alien species, but does not include data from academic theses.
The present review was restricted to crustacean taxa larger than 0.5 mm. This 0.5-mm threshold was established as an operational inclusion criterion to increase comparability of data between studies using different sampling gears and targeting different habitats. Thus records of predominantly microcrustacean taxa such as Copepoda and Cladocera were excluded.

Results and Discussion

The literature review found 56 studies that were conducted within the defined regional limits and during the years 1932 to 2026, reporting a total of 256 species of Crustacea. Based on these compiled data records, it was observed that the identified species in the region are distributed along a broad depth gradient from shallow coastal waters (≤ 50 m) to deep marine environments (> 50 m) and include a highly diverse range of benthic and pelagic habitats, both soft and hard substrates (Table 1).
The early studies of Iskenderun Bay by Monod (1932) and Gruvel (1936) documented both Red Sea/Indo-Pacific and native Mediterranean crustacean species, such as *Penaeus* (*Eopenaeus*) *semisulcatus*, *Penaeus* (*Marsupenaeus*) *pulchricaudatus*, *Portunus pelagicus*, and *Myra subgranulata*, as well as the native Mediterranean species such as *Penaeus* (*Melicertus*) *kerathurus* and *Parapenaeus longirostris* These historical records indicate that Iskenderun Bay

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has long been an important area for the northward expansion and establishment of Lessepsian species introduced through the Suez Canal. However, because the early studies did not provide station-specific sampling information, they cannot be used to make reliable assessments of habitat preferences, depth distributions or relative abundances. Accordingly, these publications should be considered primarily as historical and biogeographical records of crustacean research in Iskenderun Bay rather than as standardized ecological surveys.

Among the studies conducted in Iskenderun Bay, the investigation by Çınar et al. (2008), which examined the structural characteristics of zoobenthic communities along the Levantine coast, recorded the highest number of crustacean species. This study also represents the most comprehensive survey conducted in the region to date. Samples were collected between 0 and 50 m depth from a range of biotopes, including rocky and sandy bottoms, mussel beds formed by *Brachidontes pharaonis* and *Modiolus barbatus*, and algal assemblages dominated by *Jania rubens*, *Cystoseira elegans*, *Padina pavonica*, *Ulva* sp. and *Dictyota dichotoma*. A total of 109 crustacean species were identified.

During the literature review, *Penaeus japonicus* was also encountered in several historical records. However, this species was excluded from the checklist because recent genetic evidence indicates that specimens reported from the Turkish coast correspond to *P. pulchricaudatus* rather than *P. japonicus* (Deval et al., 2023). Accordingly, the records of *P. japonicus* reported by Monod (1932), Enzenross and Enzenross (1987) and Can et al. (2004) were reassigned to *P. pulchricaudatus*. Similarly, the record of *Myra fugax* reported by Monod (1932) was regarded as a misidentification and omitted from the checklist. Recent taxonomic studies have shown that specimens from the Turkish coast identified as *M. fugax* actually belong to *Myra subgranulata* (Bakır et al., 2024).

Table 1. Reported marine crustacean taxa from Iskenderun Bay, including source references, depth range, habitat type [Alien species are marked with an asterisk (*). Depth categories are defined as S: shallow water (≤50 m) and D: deep water (>50 m). Habitat codes are as follows: Hs, hard substratum, including algae, sponges, and mussels; Ss, soft substratum, including sediments and seagrass-associated habitats; P, pelagic habitat; Ps, parasitic association; and W, submerged wood. E: economic importance, BC: Barcelona Convention and BN: Bern Convention.].

Species	Sources	Depth range	Habitat
Order: Balanomorpha			
Amphibalanus amphitrite (Darwin, 1854)	22, 28	S	Hs
**Amphibalanus improvisus* (Darwin, 1854)	12	S	Hs
Chthamalus montagui Southward, 1976	22, 35	S	Hs
Chthamalus stellatus (Poli, 1791)	22, 35	S	Hs
Microeuraphia depressa (Poli, 1791)	22	S	Hs
Order: Scalpellomorpha			
Scalpellum scalpellum (Linnaeus, 1767)	42	D	Hs
Order: Leptostraca			
Nebalia bipes (Fabricius, 1780)	12	S	Ss
Order: Stomatopoda			
**Clorida albolitura* Ahyong & Naiyanetr, 2000	42, 43, 55	S	Ss
**Erugosquilla massavensis* (Kossmann, 1880)	5, 42, 43, 50, 52, 55	S-D	Ss
Rissoides desmaresti (Risso, 1816)	55	S	Ss
Squilla mantis (Linnaeus, 1758)	42	S-D	Ss
Order: Mysida			

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Gastrosaccus sanctus (Van Beneden, 1861)	22	S	Ss
Gastrosaccus spinifer (Goës, 1864)	12, 22	S	Ss
Mesopodopsis slabberi (Van Beneden, 1861)	45	S	Ss-P
Paramysis (*Longidentia*) *helleri* (G.O. Sars, 1877)	22	S	Ss
Siriella clausii G.O. Sars, 1877	22	S	Ss-P
Order: Amphipoda			
Ampelisca brevicornis (A. Costa, 1853)	12, 31, 34	S	Ss
Ampelisca diadema (A. Costa, 1853)	31, 37	S	Ss
Ampelisca gibba G.O. Sars, 1883	34	S	Ss
Ampelisca massiliensis Bellan-Santini & Kaim-Malka, 1977	37	D	Ss
Ampelisca multispinosa Bellan-Santini & Kaim-Malka, 1977	34	S-D	Ss
Ampelisca provincialis Bellan-Santini & Kaim-Malka, 1977	34	D	Ss
Ampelisca pseudosarsi Bellan-Santini & Kaim-Malka, 1977	22	S-D	Ss
Ampelisca ruffoi Bellan-Santini & Kaim-Malka, 1977	37	S-D	Ss
Ampelisca sarsi Chevreux, 1888	34	S-D	Ss
Ampelisca tenuicornis Liljeborg, 1856	34	S	Ss
Ampelisca truncata Bellan-Santini & Kaim-Malka, 1977	34	S-D	Hs-Ss
Ampelisca typica (Spence Bate, 1857)	34	S-D	Ss
Ampithoe ferox (Chevreux, 1902)	4	S	Hs-Ss
Ampithoe ramondi Audouin, 1826	4, 22, 31, 51	S	Hs-Ss
Ampithoe riedli Krapp-Schickel, 1968	4, 22, 31	S	Hs-Ss
Aora spinicornis Afonso, 1976	4	S-D	Hs-Ss
Apherusa chiereghinii Giordani Soika, 1950	22	S	Ss
Apohyale crassipes (Heller, 1866)	4, 22	S	Hs-Ss
Apohyale perieri (Lucas, 1846)	4, 22	S	Hs
Apolochus neapolitanus (Della Valle, 1893)	4	S	Ss
Apolochus picadurus (J.L. Barnard, 1962)	22, 31	S	Hs-Ss
Apocorophium acutum (Chevreux, 1908)	22	S	Hs-Ss
Bathyporeia lindstromi Stebbing, 1906	12	S-D	Ss
Bathyporeia guilliamsoniana (Spence Bate, 1857)	4, 12, 22, 34	S-D	Ss
Biancolina algicola Della Valle, 1893	4	S	Hs-Ss
Caprella acanthifera Leach, 1814	22	S	Hs-Ss
Caprella grandimana Mayer, 1882	22	S	Hs
Caprella hirsuta Mayer, 1890	22	S	Hs
Centraloecetes dellavallei (Stebbing, 1899)	22, 34	S	Ss
Cheirocratus sp.	37	S-D	Hs
Cheiriphotis mediterranea Myers, 1983	34	S	Ss
Chelura terebrans Philippi, 1839	22	S	Hs-Ss-W
Colomastix pusilla Grube, 1861	34	S	Hs
Deflexilodes acutipes (Ledoyer, 1983)	34	S	Ss
Dexamine spiniventris (A. Costa, 1853)	22, 31	S	Hs-Ss
Dexamine spinosa (Montagu, 1813)	4, 12, 22, 34	S	Hs-Ss
Echinogammarus sp.	31	S	Hs
Elasmopus pectenicrus (Spence Bate, 1863)	21, 22	S	Hs-Ss
Elasmopus pocillimanus (Spence Bate, 1863)	4, 22, 31, 44	S	Hs-Ss
Ericthonius brasiliensis (Dana, 1853)	4, 12, 22, 31	S	Hs
Ericthonius difformis H. Milne Edwards, 1830	31	S	Hs

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Ericthonius punctatus (Spence Bate, 1857)	22, 31	S	Hs
Eriopisa elongata (Bruzelius, 1859)	34, 37	D	Ss
Gammarella fucicola (Leach, 1814)	4, 22, 31	S	Hs-Ss
Gammaropsis sophiae (Boeck, 1861)	31	D	Hs-Ss
Haploops nirae Kaïm-Malka, 1976	34	S-D	Ss
Harpinia antennaria Meinert, 1890	37	S-D	Ss
Harpinia crenulata (Boeck, 1871)	37	S-D	Ss
Harpinia dellavallei Chevreux, 1911	34, 37	S-D	Ss
Harpinia pectinata G.O. Sars, 1891	34, 37	S-D	Ss
Harpinia truncata Sars, 1891	34	S-D	Ss
Hippomedon massiliensis Bellan-Santini, 1965	34	S-D	Ss
Jassa falcata (Montagu, 1808)	4	S	Ss
Jassa marmorata Holmes, 1905	22, 31	S	Ss
Kroyera carinata Spence Bate, 1857	12	S-D	Ss
**Latigammaropsis togoensis* (Schellenberg, 1925)	19, 22	S	Hs-Ss
Lembos websteri Spence Bate, 1856	22, 34	S	Hs-Ss
Leptocheirus bispinosus Norman, 1908	37	S	Hs-Ss
Leptocheirus pectinatus (Norman, 1869)	34	S-D	Ss
Leptocheirus pilosus Zaddach, 1844	22	S-D	Hs-Ss
Leucothoe lilljeborgi Boeck, 1861	4, 34	S-D	Ss
Leucothoe occulta Krapp-Schickel, 1975	34	S	Ss
Leucothoe richiardii Lessona, 1865	12, 37	S-D	Ss
Leucothoe spinicarpa (Abildgaard, 1789)	22, 44	S	Ss
Liropus elongatus Mayer, 1890	34	S	Ss
Lysianassa caesarea Ruffo, 1987	22	S	Hs-Ss
Lysianassa costae H. Milne Edwards, 1830	22, 34	S-D	Ss
Lysianassa pilicornis Heller, 1866	4	S-D	Ss
Lysianassina longicornis (Lucas, 1846)	22	S-D	Ss
Maera grossimana (Montagu, 1808)	22	S	Ss
Maera sodalis Karaman & Ruffo, 1971	34	D	Ss
Medicorophium rotundirostre (Stephensen, 1915)	37	S	Ss
Megaluropus massiliensis Ledoyer, 1976	22	S	Ss
Melita hergensis Reid, 1939	22	S	Ss
Metaphoxus gruneri Karaman, 1986	34	S	Ss
Metaphoxus simplex (Spence Bate, 1858)	12	S-D	Ss
Microdeutopus anomalus (Rathke, 1843)	22	S	Ss
Microdeutopus bifidus Myers, 1977	34	S	Hs-Ss
Microdeutopus similis Myers, 1977	22	S	Ss
Microdeutopus stationis Della Valle, 1893	4	S	Ss
Neoischyrocerus inexpectatus (Ruffo, 1959)	22	S	Hs
Nototropis massiliensis (Bellan-Santini, 1975)	22	S-D	Ss
Othomaera schmidtii (Stephensen, 1915)	22, 34, 37	S-D	Ss
Paraphoxus oculatus (G. O. Sars, 1879)	37	S-D	Ss
Parhyale aquilina (Costa, 1857)	4	S	Hs
Pereionotus testudo (Montagu, 1808)	22	S	Ss
Perioculodes aequimanus (Kossman, 1880)	22, 34	S-D	Ss
Perioculodes longimanus (Spence Bate & Westwood, 1868)	12, 22	S-D	Ss

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Phtisica marina Slabber, 1769	4, 31, 34	S-D	Ss
Platorchestia platensis (Krøyer, 1845)	4	S	Ss
Plumulojassa ocia (Spence Bate & Westwood, 1862)	31	S	Ss
Podocerus variegatus Leach, 1814	22	S	Hs
Pontocrates arenarius (Spence Bate, 1858)	22, 34	S	Ss
Protohyale (*Boreohyale*) *camptonyx* (Heller, 1866)	4, 22	S	Hs
Protohyale (*Protohyale*) *schmidtii* (Heller, 1866)	4, 22	S	Hs
Pseudoprotella phasma (Montagu, 1804)	22	S	Ss
Ptilohyale littoralis (Stimpson, 1853)	22	S	Hs
Quadrimaera inaequipes (A. Costa in Hope, 1851)	22, 44	S	Ss
Stenothoe eduardi Krapp-Schickel, 1976	22	S-D	Hs-Ss
Stenothoe gallensis Walker, 1904	22	S	Hs
Tritaeta gibbosa (Spence Bate & Westwood, 1862)	22, 34	S	Hs-Ss
Tryphosa nana (Krøyer, 1846)	12, 37	S	Ss
Urothoe grimaldii Chevreux, 1895	12, 22, 34	S	Ss
Urothoe poseidonis Reibish, 1905	12	S	Ss
Order: Isopoda			
Anilocra physodes (Linnaeus, 1758)	12	S-D	Ps
Anthura gracilis (Montagu, 1808)	37	S	Hs
Apanthura corsica Amar, 1953	22	S	Ss
Cleantis prismatica (Risso, 1827)	22	S	Hs
Compecopea sp.	22	S	Hs
Cyathura carinata (Krøyer, 1847)	22	S-D	Ss
Cymodoce spinosa (Risso, 1816)	22	S	Hs-Ss
Cymodoce truncata Leach, 1814	22	S	Hs-Ss
Cymodoce tuberculata A. Costa in Hope, 1851	22	S	Hs-Ss
Dynamene bicolor (Rathke, 1836)	22, 44	S	Hs-Ss
Dynamene edwardsi (Lucas, 1849)	22	S	Hs-Ss
Eurydice affinis Hansen, 1905	22	S	Hs-Ss
Eurydice pulchra Leach, 1816	12, 37	S-D	Ss
Eurydice spinigera Hansen, 1890	22	S	Ss-P
Eurydice truncata (Norman, 1868)	37	S-D	Ss
Gnathia vorax (Lucas, 1849)	22, 44	S-D	Ss
Idotea balthica (Pallas, 1772)	51	S	Hs-Ss-P
Jaera sp.	22	S	Hs
Janira maculosa Leach, 1814	22, 44	S-D	Hs-Ss
Lekanesphaera monodi (Arcangeli, 1934)	22	S	Ss
Ligia italica Fabricius, 1798	22	S	Hs
Limnoria tripunctata Menzies, 1951	28	S	Hs-W
Paradella sp.	22	S	Hs
Paranthura costana Bate & Westwood, 1866	22	S	Ss
Order: Tanaidacea			
Apseudopsis latreillii (Milne Edwards, 1828)	12, 22, 31, 37, 44	S	Hs-Ss
Chondrochelia savignyi (Kroyer, 1842)	22, 44, 51	S-D	Hs-Ss
*Tanais dulongii (*Audouin, 1826)	22	S	Hs-Ss
Order: Cumacea			
Bodotria scorpioides (Montagu, 1804)	12, 22	S-D	Hs-Ss

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Campylaspis glabra Sars, 1878	37	D	Ss
Cumella (*Cumella*) *limicola* Sars, 1879	22	S	Hs-Ss-P
Cumella (*Cumella*) *pygmaea* G.O. Sars, 1865	37	S	Ss-P
Eudorella truncatula (Bate, 1856)	37	S-D	Ss
Iphinoe elisae Băcescu, 1950	12	S-D	Ss
Eucuma sp.	22	S	Hs
Pseudocuma (*Pseudocuma*) *longicorne* (Bate, 1858)	12	S-D	Hs-Ss-P
Order: Decapoda			
Acanthonyx lunulatus (Risso, 1816)	22, 29	S	Hs-Ss
Achaeus gracilis (O.G. Costa, 1839)	22	S	Hs-Ss
Aegaeon cataphractus (Olivi, 1792)	42	S	Hs
Aegaeon lacazei (Gourret, 1887)	42	D	Ss
Albunea carabus (Linnaeus, 1758)	14	S	Ss
Alpheus dentipes Guérin, 1832	29	S-D	Hs
Alpheus glaber (Olivi, 1792)	12, 22	S-D	Hs
**Alpheus inopinatus* Holthuis & Gottlieb, 1958	31	S-D	Hs
**Alpheus migrans* Lewinsohn & Holthuis, 1978	22, 31, 37	S	Hs
**Alpheus rapacida* De Man, 1908	22, 31	S-D	Hs
Anapagurus laevis (Bell, 1845)	37	S-D	Ss
Ashtoret lunaris (Forskål, 1775)	38	S	Ss
**Atergatis roseus* (Rüppell, 1830)	5, 6, 7, 15, 42	S	Hs-Ss
Athanas nitescens (Leach, 1814)	22, 29	S-D	Hs-Ss
Brachynotus foresti Zariquiey Álvarez, 1968	22	S	Hs
Calcinus tubularis (Linnaeus, 1767)	22	S	Hs
Callianassa subterranea (Montagu, 1808)	12, 37	S	Ss
*, [E]*Callinectes sapidus* Rathbun, 1896	5, 10, 15, 17, 32, 43, 55	S	Ss
[E]*Carcinus aestuarii* Nardo, 1847	55	S	Hs-Ss
**Carupa tenuipes* Dana, 1852	42	S	Hs
Cestopagurus timidus (Roux, 1830)	22	S-D	Hs
**Charybdis* (*Charybdis) hellerii* (A. Milne-Edwards, 1867)	5, 6, 15, 20, 22, 27	S	Hs-Ss
**Charybdis* (*Archias*) *longicollis* Leene, 1938	6, 15, 24, 41, 42, 43, 55	S	Ss
Clibanarius erythropus (Latreille, 1818)	22	S	Hs-Ss
**Coleusia signata* (Paulson, 1875)	5, 6	S	Hs-Ss
Crangon crangon (Linnaeus, 1758)	12	S-D	Ss
Dardanus calidus (Risso, 1827)	14	S	Ss
Diogenes pugilator (Roux, 1829)	12, 22	S	Hs-Ss
Dromia personata (Linnaeus, 1758)	15, 22	S-D	Hs-Ss
[E]*Eriphia verrucosa* (Forskål, 1775)	15	S	Hs-Ss
Ethusa mascarone (Herbst, 1785)	15, 42	S-D	Hs-Ss
**Eucrate crenata* (De Haan, 1835)	6, 7	S	Ss
**Eurycarcinus integrifrons* De Man, 1879	26, 30, 31	S	Ss
Gilvossius tyrrhenus (Petagna, 1792)	12	S	Hs-Ss
Goneplax rhomboides (Linnaeus, 1758)	12, 15, 42	S-D	Ss
Homola barbata (Fabricius, 1793)	42	S-D	Hs
Hippolyte leptocerus (Heller, 1863)	22	S	Hs-Ss
Latreillia elegans Roux, 1830	42	S-D	Ss

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**Leptochela pugnax* De Man, 1916	12, 22, 31, 37	S-D	Ss
Liocarcinus depurator (Linnaeus, 1758)	15, 42	S-D	Ss
**Liomera rugipes* (Heller, 1861)	54	S	Hs
Inachus communissimus Rizza, 1839	42	S	Hs-Ss
**Ixa monodi* Holthuis & Gottlieb, 1956	5, 6, 15, 42, 43, 55	S-D	Ss
Macrophthalmus (*Macrophthalmus*) *graeffei* A. Milne-Edwards, 1873	8, 12, 22, 31, 37	S-D	Hs-Ss
Macropodia linaresi Forest & Zariquiey Álvarez, 1964	42	S-D	Hs-Ss
Macropodia longirostris (Fabricius, 1775)	42	S-D	Hs-Ss
Macropodia rostrata (Linnaeus, 1761)	15, 31, 42	S-D	Hs-Ss
Macropodia tenuirostris (Leach, 1814)	42	S-D	Hs-Ss
[BN, E]*Maja squinado* (Herbst, 1788)	15	S-D	Hs-Ss
**Matuta victor* (Fabricius, 1781)	46, 49	S-D	Ss
Medorippe lanata (Linnaeus, 1767)	15, 42	S	Ss
**Metapenaeopsis aegyptia* Galil & Golani, 1990	43, 55	S-D	Ss
*, [E]*Metapenaeus monoceros* (Fabricius, 1798)	9, 13, 16, 40, 42, 43, 47, 53, 55	S	Ss
*, [E]*Metapenaeus stebbingi* Nobili, 1904	9, 55	S	Ss
**Micippa thalia* (Herbst, 1803)	8	S	Hs
Monodaeus couchii (Couch, 1851)	42	S	Ss
Munida sp.	42	S-D	Hs
**Myra subgranulata* Kossmann, 1877	1, 15, 55	S-D	Hs-Ss
[BC, BN]*Ocypode cursor* (Linnaeus, 1758)	15	S-D	Ss
**Ogyrides mjoebergi* (Balss, 1921)	22, 25	S	Ss
Pachygrapsus marmoratus (Fabricius, 1787)	15, 22, 23, 35	S	Hs
Pachygrapsus maurus (Lucas, 1846)	22, 23	S	Hs
Paguristes eremita (Linnaeus, 1767)	14	S	Hs-Ss
Pagurus alatus Fabricius, 1775	14	S-D	Ss
Pagurus anachoretus Risso, 1827	22	S-D	Hs-Ss
Pagurus chevreuxi (Bouvier, 1896)	42	S-D	Hs-Ss
Pagurus prideaux Leach, 1815	42	S-D	Ss
Palaemon serratus (Pennant, 1777)	12,	S-D	Hs-Ss
Paragalene longicrura (Nardo, 1869)	36	S	Hs
[E]*Parapenaeus longirostris* (Lucas, 1846)	1, 40, 42	S-D	Ss
Pasiphaea sivado (Risso, 1816)	42	D	Ss
*, [E]*Penaeus* (*Eopenaeus*) *semisulcatus* De Haan, 1844	1, 2, 5, 9, 16, 24, 40, 42, 43, 47, 53, 55, 56	S-D	Ss
*, [E]*Penaeus* (*Farfantepenaeus*) *aztecus* Ives, 1891	33, 53	S	Ss
*[E]*Penaeus* (*Fenneropenaeus*) *merguiensis* De Man, 1888	18	S	Ss
*[E]*Penaeus* (*Marsupenaeus*) *pulchricaudatus* Stebbing, 1914	1, 2, 5, 13, 16, 42	S	Ss
[E]*Penaeus* (*Melicertus*) *kerathurus* (Forskål, 1775)	1, 13, 16, 42, 43, 55	S-D	Ss
*, [E]*Penaeus* (*Oleopenaeus*) *hathor* Burkenroad, 1959	11, 16, 20, 40	S	Ss
Pilumnus hirtellus (Linnaeus, 1761)	15, 22, 23, 29, 42	S-D	Hs
Pisa armata (Latreille, 1803)	42	S	Hs-Ss
Pisa nodipes Leach, 1815	42	S-D	Hs-Ss
Pisidia bluteli (Risso, 1816)	22	S	Hs-Ss
[E]*Plesionika edwardsii* (Brandt, 1851)	42	D	Ss

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Polycheles perarmatus Holthuis, 1952	42	D	Ss
Portumnus latipes (Pennant, 1777)	12, 15	S	Hs-Ss
Portunus pelagicus (Linnaeus, 1758)	1, 2, 3, 6, 9, 10, 15, 17	S	P
[E]Portunus segnis (Forskål, 1775)	32, 43, 55	S	P
Processa canaliculata Leach, 1815	42	S-D	Hs-Ss
Processa edulis (Risso, 1816)	37	S	Hs-Ss
Processa elegantula Nouvel & Holthuis, 1957	12	S-D	Hs-Ss
Processa nouveli Al-Adhub & Williamson, 1975	12	S-D	Hs-Ss
Processa robusta Nouvel & Holthuis, 1957	12	S	Hs-Ss
Sicyonia carinata (Brünnich, 1768)	42	S-D	Hs-Ss
**Sicyonia lancifer* (Olivier, 1811)	39, 42	D	Ss
[E]Solenocera membranacea (Risso, 1816)	42	S-D	Ss
Spinolambrus macrochelos (Herbst, 1790)	42	S-D	Ss
Synalpheus africanus Crosnier & Forest, 1965	42	S	Hs
**Thalamita poissonii* (Audouin, 1826)	12, 22, 31, 42	S	Hs-Ss
[E]Upogebia pusilla (Petagna, 1792)	12, 31	S-D	Hs-Ss
Upogebia tipica (Nardo, 1869)	22, 31	S	Ss
**Urocaridella pulchella* Yokes & Galil, 2006	48	S	Hs
Xantho pilipes A. Milne-Edwards, 1867	22	S-D	Hs-Ss

1: Monod, 1932; 2:Gruvel, 1936; 3: Holthuis & Gottlieb, 1958; 4: Kocataş & Katağan, 1978; 5: Enzenross & Enzenross, 1987; 6: Enzenross & Enzenross, 1990; 7: Enzenross et al., 1992; 8: Enzenross & Enzenross, 1995; 9: Kumlu et al., 1999; 10: Türeli et al., 2000; 11: Kumlu et al., 2002; 12: Mutlu, 2002; 13: Can et al., 2004; 14: Koçak et al., 2005; 15: Özcan et al., 2005; 16: Türkmen, 2005; 17: Özcan & Akyurt, 2006; 18: Özcan et al., 2006; 19: Bakır et al., 2007; 20: Özcan et al., 2007; 21: Sezgin et al., 2007; 22: Çınar et al., 2008; 23: Doğan et al., 2008; 24: Fırat, et al., 2008; 25: Özcan et al., 2008; 26: Özcan et al., 2010a; 27: Özcan et al., 2010b; 28: Şen et al., 2010; 29: Özcan & Katağan, 2011; 30: Turan et al., 2011; 31: Çevik et al., 2012; 32: Özcan, 2012; 33: Bilecenoğlu et al., 2013; 34: Bakır & Katağan, 2014; 35: İnandı et al., 2014; 36: Gönülal et al., 2015; 37: Mutlu, 2015; 38: Turan_et al., 2015; 39: Gönülal et al., 2016; 40: Kaymacı & Altun, 2016; 41: Özcan & Katağan, 2016; 42: Gönülal & Dalyan, 2017; 43: Yeşilyurt & Türeli, 2018; 44: Çınar et al., 2019; 45: Özcan et al., 2019; 46: Yeşilyurt et al., 2019; 47: Can et al., 2021; 48: Ergüden et al., 2021; 49: Türeli & Leba, 2023; 50: Yeşilyurt & Türeli, 2024; 51: Alkan & Özcan, 2025; 52: Başusta & Çevik, 2025; 53: Özbek & Demirci, 2025; 54: Özcan & Özcan, 2025; 55: Türeli et al., 2025; 56: Göçer et al., 2026.

The recorded fauna comprised ten crustacean orders. Amphipoda was the most species-rich order, with 104 species, followed by Decapoda with 101 species and Isopoda with 24 species. Together, these three orders accounted for 229 of the 256 reported species. The remaining orders were Cumacea (8 species), Balanomorpha and Mysida (5 species each), Stomatopoda (4 species), Tanaidacea (3 species) and Scalpellomorpha and Leptostraca (1 species each) (Figure 2).

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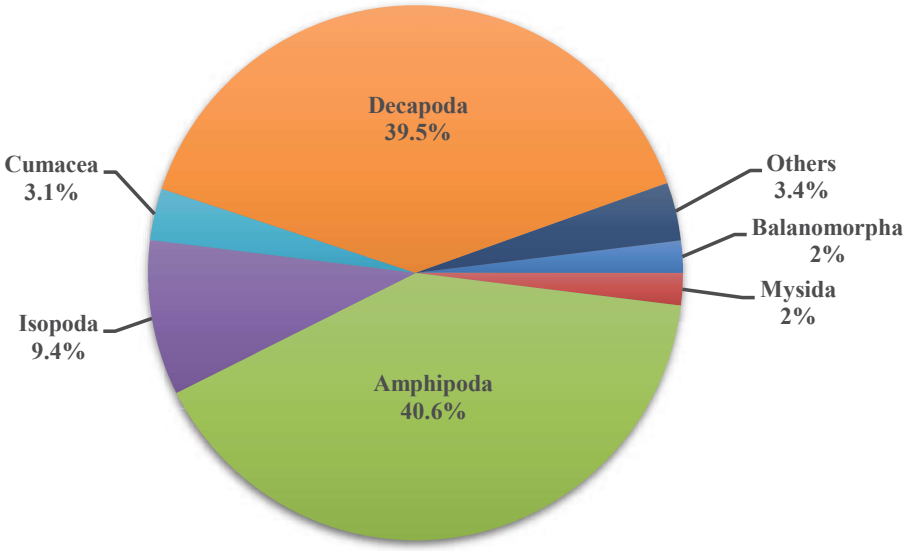


Figure 2. Relative contribution of crustacean orders to the total number of reported species in Iskenderun Bay. "Others" includes Balanomorpha, Scalpellomorpha, Leptostraca, Stomatopoda, Mysida, and Tanaidacea.

The compiled data revealed distinct habitat preferences among the recorded species: 121 species were found to exclusively inhabit soft substrates, while 49 species are restricted to hard substrates. The remaining 86 species consist of taxa with diverse ecological traits, including those occupying multiple substrate types, as well as pelagic (*P. pelagicus* and *P. segnis*), parasitic, and wood-boring (submerged wood) (*Chelura terebrans*) organisms.
In terms of depth distribution, 153 species are confined to shallow waters (≤ 50 m), whereas 91 species were identified as either exclusively inhabiting deep waters (> 50 m) or possessing a broader bathymetric tolerance, occurring in both shallow and deep zones.

Alien species
The total number of alien crustacean species recorded from Iskenderun Bay was 34 which corresponds to about 13 % of 256 species reported in the present dataset. The species comprised one Balanomorpha, two Stomatopoda, one Amphipoda and 30 Decapoda. Thus, Decapoda was the group with the highest number of reported species among the alien taxa, representing 87.1% of all alien species (Table 2). This dominance is in accordance with the important role of decapods in Lessepsian migration and their ability to exploit a wide range of habitats in the Eastern Mediterranean (Corsini-Foka et al., 2017).

Table 2. Reported alien crustacean species from Iskenderun Bay and their proposed or presumed introduction pathways (Compiled from Enzenross & Enzenross, 1990; 1995; Çınar et al., 2021; Özcan & Özcan, 2025).

Ordo	Species	Pathways
Balanomorpha	*Amphibalanus improvisus*	Shipping
Stomatopoda	*Clorida albolitura*	Suez Canal
Stomatopoda	*Erugosquilla massavensis*	Suez Canal
Amphipoda	*Latigammaropsis togoensis*	Shipping
Decapoda	*Alpheus inopinatus*	Suez Canal
Decapoda	*Alpheus migrans*	Suez Canal
Decapoda	*Alpheus rapacida*	Suez Canal
Decapoda	*Atergatis roseus*	Suez Canal

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Decapoda	*Callinectes sapidus*	Shipping
Decapoda	*Carupa tenuipes*	Suez Canal
Decapoda	*Charybdis* (*Charybdis*) *hellerii*	Suez Canal
Decapoda	*Charybdis* (*Archias*) *longicollis*	Suez Canal
Decapoda	*Coleusia signata*	Suez Canal
Decapoda	*Eucrate crenata*	Suez Canal
Decapoda	*Eurycarcinus integrifrons*	Shipping
Decapoda	*Leptochela pugnax*	Suez Canal
Decapoda	*Liomera rugipes*	Suez Canal
Decapoda	*Ixa monodi*	Suez Canal
Decapoda	*Matuta victor*	Suez Canal
Decapoda	*Metapenaeopsis aegyptia*	Suez Canal
Decapoda	*Metapenaeus monoceros*	Suez Canal
Decapoda	*Metapenaeus stebbingi*	Suez Canal
Decapoda	*Micippa thalia*	Suez Canal
Decapoda	*Myra subgranulata*	Suez Canal
Decapoda	*Ogyrides mjoebergi*	Suez Canal
Decapoda	*Penaeus* (*Eopenaeus*) *semisulcatus*	Suez Canal
Decapoda	*Penaeus* (*Farfantepenaeus*) *aztecus*	Shipping
Decapoda	*Penaeus* (*Fenneropenaeus*) *merguiensis*	Suez Canal
Decapoda	*Penaeus* (*Marsupenaeus*) *pulchricaudatus*	Suez Canal
Decapoda	*Penaeus* (*Oleopenaeus*) *hathor*	Suez Canal
Decapoda	*Portunus segnis*	Suez Canal
Decapoda	*Sicyonia lancifer*	Suez Canal
Decapoda	*Thalamita poissonii*	Suez Canal
Decapoda	*Urocaridella pulchella*	Suez Canal

Protected species

Only two species of crustacean identified from Iskenderun Bay, *Maja squinado* and *Ocypode cursor* were found to be listed under the Bern and/or Barcelona conventions (Table 1). *M. squinado* is under the Bern Convention and *O. cursor* is under both the Bern Convention and the Barcelona Convention.

The occurrence of *O. cursor* in the protected species is of particular importance, as this species is strongly linked to sandy beaches and dune habitats that are highly sensitive to coastal development, recreational activities, beach cleaning, and other anthropogenic disturbances (Marchessaux et al., 2024). Recent studies have reported declines of *O. cursor* populations in intensively used Mediterranean coastal areas. They have also shown that recreational disturbance may reduce burrow abundance and alter the activity patterns of the species (Galil et al., 2024). The results suggest that conservation of *O. cursor* in Iskenderun Bay should not be limited to the protection of individual animals but should also include the preservation of suitable sandy-shore habitats and restriction of activities that cause habitat degradation.

Economic Importance

Eighteen crustacean species of economic importance have been reported from the Iskenderun Bay. Among these species, shrimps are particularly prominent (Table 1). The economically important shrimp species reported from the region include *Metapenaeus monoceros*, *M. stebbingi*, *Parapenaeus longirostris*, *Penaeus* (*Eopenaeus*) *semisulcatus*, *P.* (*Farfantepenaeus*) *aztecus*, *P.* (*Fenneropenaeus*) *merguiensis*, *P.* (*Marsupenaeus*) *pulchricaudatus*, *P.* (*Melicertus*) *kerathurus*, *P.* (*Oleopenaeus*) *hathor*, *Plesionika edwardsii*, *P. martia* and

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Solenocera membranacea (Kumlu et al., 1999; Can et al., 2004; Türkmen, 2005; Can et al., 2006; Kaymacı & Altun, 2016; Özbek & Demirci, 2025). In addition to shrimps, economically important crab species include *Callinectes sapidus*, *Carcinus aestuarii*, *Eriphia verrucosa*, *Maja squinado* and *Portunus segnis* (Türeli et al., 2000; Özcan & Akyurt, 2006; Özcan, 2012; Harlıoğlu et al., 2018). *Upogebia pusilla* is economically important primarily as a live bait, not for direct consumption (Aydın & İlkyaz, 2021). However, the economic importance of these species can vary according to their market value, the volume of their catch, their stock status, their contribution to regional fisheries and the pattern of utilization. For the alien or lessepsian species included in the list, their economic value should be evaluated together with their potential ecological effects (Zenetos et al., 2010).

Conclusions

This review synthesizes the fragmented data on the crustacean fauna of Iskenderun Bay and provides a solid baseline for future taxonomic, ecological and biodiversity studies. Since the bay is under multiple pressures (urbanization, industrial activities, port infrastructure, fishing pressure and presence of non-native species), regular monitoring of faunal changes is necessary. In this context, the establishment of standardized long-term monitoring programs with comparable sampling methods across a range of habitats and seasons is considered a primary requirement. Such initiatives are crucial for assessing the current distribution and abundance of species, monitoring the spread of alien taxa and providing a stronger scientific basis for the conservation of regional biodiversity.

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Ethics Approval

Not applicable. This study is a literature review and did not involve any experiments on humans or animals; therefore, ethical approval was not required.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

Author Contribution

Ozge OZGEN: Investigation, Data curation, Writing – original draft. Elif ACAR: Investigation, Data curation.

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