

Portunus pelagicus
Blue Swimming Crab



Scientific classification

Kingdom:	Animalia
Phylum:	Arthropoda
Subphylum:	Crustacea
Class:	Malacostraca
Order:	Decapoda
Infraorder:	Brachyura
Family:	Portunidae
Genus:	Portunus
Species:	<i>P. armatus</i>

Binomial name

Portunus armatus
(Linnaeus, 1758)

Synonyms

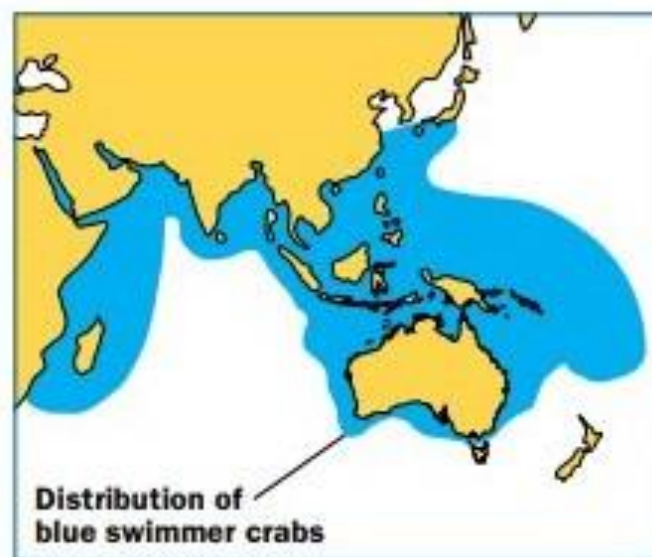
Cancer pelagicus Linnaeus, 1758

A. Environment/Ecology:

Environment

Reef-associated; brackish; depth range 0 - 65 m (Ref. [111223](#)). Tropical, preferred 26°C (Ref. [107945](#)); 35°N - 15°S, 99°E - 137°E

B. Distribution:












Present in 16 countries/islands (endemic, native, introduced)

Continent	Country		Occurrence	Main Ref.
Asia	Brunei Darussalam	BRN	native	343
Asia	Cambodia	KHM	native	343
Asia	China	CHN	native	343
Asia	Indonesia	IDN	native	343
Asia	Japan	JPN	native	85185
Asia	Malaysia	MYS	native	343
Asia	Philippines	PHL	native	10
Asia	Singapore	SGP	native	343
Asia	Taiwan	TWN	native	343
Asia	Thailand	THA	native	343
Asia	Timor-Leste	TLS	native	343
Asia	Viet Nam	VNM	native	343
Oceania	Australia	AUS	native	85185
Oceania	Guam	GUM	native	343
Oceania	Palau	PLW	native	103126
Oceania	Tonga	TON	native	343

Reported from 40 countries/islands.

Continent	Country	Occurrence	Main Ref.
Africa	Egypt	EGY misidentification	74480
Asia	Bahrain	BHR misidentification	801
Asia	Brunei Darussalam	BRN native	343
Asia	Cambodia	KHM native	343
Asia	China	CHN native	343
Asia	Cyprus	CYP misidentification	74480
Asia	India	IND misidentification	80365
Asia	Indonesia	IDN native	343
Asia	Iran	IRN misidentification	107268
Asia	Israel	ISR misidentification	74480
Asia	Japan	JPN native	85185
Asia	Kuwait	KWT misidentification	801
Asia	Lebanon	LBN misidentification	74480
Asia	Malaysia	MYS native	343
Asia	Pakistan	PAK misidentification	108088
Asia	Philippines	PHL native	10
Asia	Qatar	QAT misidentification	801
Asia	Saudi Arabia	SAU misidentification	801
Asia	Singapore	SGP native	343
Asia	Syria	SYR misidentification	74480
Asia	Taiwan	TWN native	343
Asia	Thailand	THA native	343
Asia	Timor-Leste	TLS native	343
Asia	Turkey	TUR misidentification	74480
Asia	United Arab Em.	ARE misidentification	102838
Asia	Viet Nam	VNM native	343
Europe	Italy	ITA misidentification	74657
Oceania	Australia	AUS native	85185
Oceania	Fiji	FJI misidentification	343
Oceania	French Polynesia	PYF misidentification	2899
Oceania	Guam	GUM native	343

Oceania	New Caledonia	NCL	misidentification 	343
Oceania	New Zealand	NZL	misidentification 	85185
Oceania	Palau	PLW	native 	103126
Oceania	Papua New Guinea	PNG	misidentification 	343
Oceania	Solomon Is.	SLB	misidentification 	343
Oceania	Tonga	TON	native 	343
Oceania	Tuvalu	TUV	misidentification 	343
Oceania	Vanuatu	VUT	misidentification 	343
Oceania	Wallis Futuna	WLF	misidentification 	343

Ecosystems where *Portunus pelagicus* occurs

n = 48

Ecosystem	Type	Status	Ref.
Bonaparte Coast	Sea/Bay/Gulf	native	111207
Central Indo-Pacific	sea/bay/gulf	native	111207
Central Polynesia	sea/bay/gulf	misidentification	343
Coral Sea and GBR	Sea/Bay/Gulf	misidentification	343
East China Sea	Sea/Bay/Gulf	native	75927
Eastern Coral Triangle	sea/bay/gulf	misidentification	343
Eastern Indo-Pacific	sea/bay/gulf	misidentification	2899
Eastern Philippines	Sea/Bay/Gulf	native	10
Fiji Islands	Sea/Bay/Gulf	misidentification	343
Gilbert/Ellis Islands	Sea/Bay/Gulf	misidentification	343
Great Barrier Reef	Sea/Bay/Gulf	misidentification	343
Gulf of Thailand	Sea/Bay/Gulf	native	343
Indian Ocean	Sea/Bay/Gulf	native	343
Lanusa Bay	Sea/Bay/Gulf	native	116864
Lesser Sunda	Sea/Bay/Gulf	native	343
Manila Bay	Sea/Bay/Gulf	native	81840
Mediterranean Sea	Sea/Bay/Gulf	misidentification	85185
New Caledonia	Sea/Bay/Gulf	misidentification	343
Northern and Central Red Sea	Sea/Bay/Gulf	misidentification	74480
Pacific Ocean	Sea/Bay/Gulf	native	343
Persian Gulf	Sea/Bay/Gulf	misidentification	107016
Red Sea	Sea/Bay/Gulf	misidentification	3565
Red Sea and Gulf of Aden	sea/bay/gulf	misidentification	3565
Sahul Shelf	sea/bay/gulf	native	111207
Shark Bay	Sea/Bay/Gulf	native	116003
Society Islands	Sea/Bay/Gulf	native	77016
Solomon Archipelago	Sea/Bay/Gulf	misidentification	343
Somali/Arabian	sea/bay/gulf	misidentification	801

South China Sea	Sea/Bay/Gulf	native	343
South Kuroshio	Sea/Bay/Gulf	native	85185
South Kuroshio - province	Sea/Bay/Gulf	native	85185
Southeast Polynesia	sea/bay/gulf	misidentification	2899
Southern China	Sea/Bay/Gulf	native	343
Sulu-Celebes Sea	Sea/Bay/Gulf	native	343
Sunda Shelf	sea/bay/gulf	native	343
Temperate Australasia	sea/bay/gulf	misidentification	85185
Temperate Northern Atlantic	sea/bay/gulf	misidentification	85185
Temperate Northern Pacific	sea/bay/gulf	native	85185
Tonga Islands	Sea/Bay/Gulf	native	343
Tropical Northwestern Pacific	sea/bay/gulf	native	343
Tropical Southwestern Pacific	sea/bay/gulf	misidentification	343
Vanuatu	Sea/Bay/Gulf	misidentification	343
Visayan Sea	Sea/Bay/Gulf	native	81840
West and South Indian Shelf	sea/bay/gulf	misidentification	116140
West Caroline Islands	Sea/Bay/Gulf	native	103126
Western Coral Triangle	sea/bay/gulf	native	10
Western India	Sea/Bay/Gulf	misidentification	116140
Western Indo-Pacific	sea/bay/gulf	misidentification	801

Distribution

A tropical species, blue swimmer crabs are found in estuaries and inshore marine waters, mainly between Nickol Bay and Dunsborough. They are also found off northern and eastern Australia and are widely distributed in the Indian and Pacific oceans, including the east coast of Africa and southern Japan. They have even been found in the Mediterranean Sea, having entered via the Suez Canal.

C. Length at first maturity / Size / Weight / Age:

Maturity: L_m [7.3](#), range 3 - ? cm

Max length : 20.0 cm CW male/unsexed; (Ref. [343](#))

Blue swimmer crabs are sometimes called 'blue manna'. In WA, they can grow to have a carapace up to 25 centimetres wide and a claw span up to 80 centimetres. The biggest blue swimmer crab caught in WA weighed more than a kilogram. These crabs belong to the Portunidae family, which also includes other large, edible crabs found in Australia such as mud crabs. Crabs from this family can usually be recognised by their flat, dischaped hind legs, used as paddles for swimming and by the nine spikes, called horns, along their carapace, either side of their eyes.

Size limit A Blue Swimmer Crab is undersized if the carapace is less than 11 cm when measured from side to side at the base of the largest spines. Size limits apply in all waters of the state

D. Short description

Short description

Carapace rough to granulose, regions discernible; front with 4 acutely triangular teeth; 9 teeth on each anterolateral margin, the last tooth 2 to 4 times larger than preceding teeth. Chelae elongate in

males; larger chela with conical tooth at base of fingers; pollex ridged. Color: males with blue markings, females dull green.

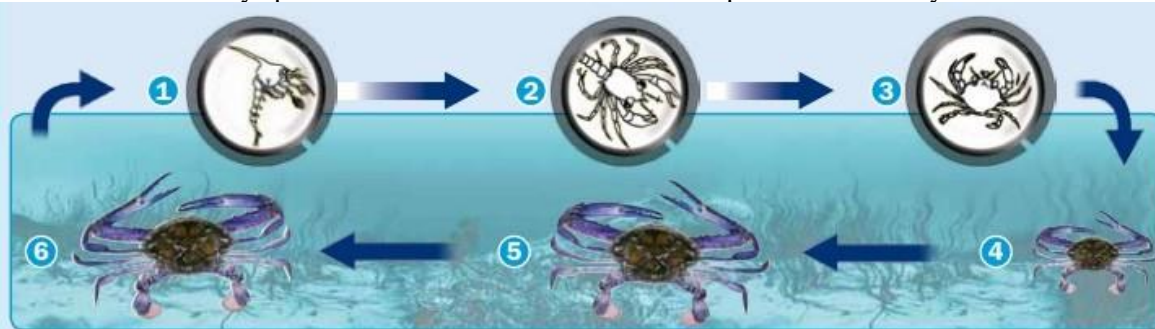
E. Biology

Matures at about 1 year. Collected mainly by artisanal traps, trawls, beach seines, cylindrical wire traps, folding traps, pots, hop nets, drop nets, and sunken crab gill nets. In shallow waters, it is caught using beach seines, rakes, and dab nets. Sold in local markets (fresh or frozen) and for the crab-flesh canning industry. Most widely sold in markets of Southeast Asia, including the Philippines (Ref. 343). Maximum depth from Ref. 801. Immediate subtidal to a depth of 40 m (Ref. 801), on sandy to sandy-muddy substrates in areas near reefs, mangroves, and sea grass and algal beds (Ref. 343). Juveniles tend to occur in shallow intertidal areas (Ref. 343). Burrows in sand when disturbed; carnivorous and voracious predator (Ref. 801). Host to protozoans, helminths and crustaceans (Ref. 104981). Members of the order Decapoda are mostly gonochoric. Mating behavior: Precopulatory courtship ritual is common (through olfactory and tactile cues); usually indirect sperm transfer (Ref. 833). Spawning occurs throughout the year, with peaks in December, March and August (Ref. 119312).

F. Life cycle and mating behavior

Life cycle

The timing and movements of blue swimmer crabs vary between locations. Estuarine crabs, such as those living in the Leschenault Inlet, Peel-Harvey Estuary and Swan River, tend to move from estuaries into nearby marine waters during winter. Crabs in marine embayments such as Cockburn Sound and Shark Bay spend their entire lives within different parts of the embayment.



Juvenile crabs

By autumn, most megalopae have formed into juvenile crabs with a recognisable crab shape and carapace three to six centimetres wide. They continue growing rapidly.

Mating

Most blue swimmer crabs mate in autumn. The males moult first, so that their shells have hardened beforehand. A courting male then catches a female and carries her beneath him for four to 10 days while fending off other males. The male helps the female to moult and then turns her over to mate while she is still soft-shelled. After mating, he continues to carry her around and protect her for another three-to-four days while her

shell hardens. A male may mate with several females during one season. The female crabs retain the males' sperm over winter until their ovaries develop – helped, it is thought, by the rising water temperature in spring.

G. Fisheries

Fisheries

The species is commercially important throughout the Indo-Pacific where they may be sold as traditional hard shells, or as "soft-shelled" crabs, which are considered a delicacy throughout Asia.

Mainly collected by artisanal traps, trawls, beach seines, cylindrical wire traps, folding traps, pots, hop nets, drop nets and crab gill nets. The total catch reported for this species to FAO for 1999 was 133 938 t. The countries with the largest catches were China (52 577 t) and Philippines (34 076 t). For sale in local markets (frozen or fresh) and for the crab-flesh canning industry. It attains lower prices than *Scylla* although crabs of *Portunus* are taken in larger quantities. The species is highly prized as the meat is almost as sweet as *Callinectes sapidus*. This species is fished heavily and almost exclusively for meat consumption in the Persian Gulf with the females sold at higher prices than males.

These characteristics, along with their fast growth, ease of larviculture, high fecundity and relatively high tolerance to both nitrate and ammonia, (particularly ammoniacal nitrogen, $\text{NH}_3\text{-N}$, which is typically more toxic than ammonium, as it can more easily diffuse across the gill membranes), makes this species ideal for aquaculture.

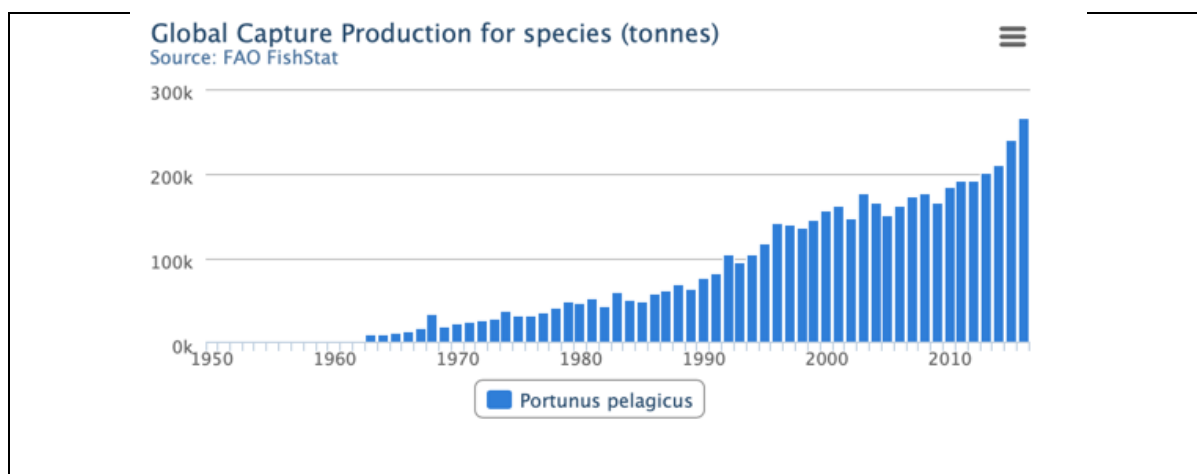
The species is commercially fished in Australia and is also available to recreational fishers and regulated by various state governments.

H. IUCN Red List Status

(NA)

I. More Information:

1) Stocks



2) Ecology

P. pelagicus commonly enters estuaries for food and shelter. Its life cycle is dependent on estuaries as the larvae and early juveniles use these habitats for growth and development. Prior to hatching, the female moves into shallow marine habitats, releases her eggs and the newly hatched zoea I larvae move into estuaries. During this time they feed on microscopic plankton and progress from the zoea I stage to the zoea IV stage (approximately 8 days) and then to the final larval stage of megalopa (duration of 4–6 days). This larval stage is characterised by having large chelipeds used to catch prey. Once the megalopa metamorphoses to the crab stage they continue to spend time in estuaries which provides a suitable habitat for shelter and food. However, evidence has shown that early juveniles cannot tolerate low salinities for extended periods, which is likely due to its weak hyper-osmoregulatory abilities.[12] This may explain their mass emigration from estuaries to

seawater during the rainy season. Male *Portunus pelagicus* are believed to become more territorial in colder water. This may explain why male crabs are rarely sighted within a close proximity to each other in more temperate waters; it also may explain why their female counterparts seem more prolific in these such areas.

Ecology of *Portunus pelagicus*

Main Ref.	Ng. P.K.L., 1998			
distribution	Marine - Neritic <ul style="list-style-type: none"> ● supra-littoral zone ● littoral zone ● sublittoral zone 	Marine - Oceanic <ul style="list-style-type: none"> ● epipelagic ● mesopelagic ● epipelagic ● abyssopelagic ● hadopelagic 	Brackishwater <ul style="list-style-type: none"> ● estuaries/lagoons/brackish seas ● mangroves ● marshes/swamps 	Freshwater <ul style="list-style-type: none"> ● rivers/streams ● lakes/ponds ● caves ● exclusively in caves
	Highlighted items on the list are where <i>Portunus pelagicus</i> may be found.			
Remarks	Immediate subtidal to a depth of 40 m (Ref. 801), on sandy to sandy-muddy substrates in areas near reefs, mangroves, and sea grass and algal beds (Ref. 343). Juveniles tend to occur in shallow intertidal areas (Ref. 343). Burrows in sand when disturbed; carnivorous and voracious predator (Ref. 801). Host to protozoans, helminths and crustaceans (Ref. 104981).			

Substrate

Substrate	Benthic: mobile; demersal; megabenthos; Soft Bottom: sand; mud;
Substrate Ref.	Ng. P.K.L., 1998
Special habitats	Beds: algae/seaweed; sea grass; Coral Reefs;
Special habitats Ref.	Ng. P.K.L., 1998

Associations

Ref.	Ng. P.K.L., 1998
associations	parasitism;
Associated with	protozoa <i>Operculariella</i> sp., <i>Acineta</i> sp., <i>Thelohania</i> sp., <i>Nematopsis</i> sp., <i>Ameson</i> sp., <i>Hematodinium</i> sp.; helminths planoceroid turbellarian, tetraphyllid cestode, <i>Levinseniella</i> sp., <i>Polypocephalus moretonensis</i> , <i>Carcinonemertes mitsukurii</i> ; crustaceans <i>Choniosphaera indica</i> , <i>Sacculina granifera</i> , <i>Octolasmis</i> spp., <i>Chelonibia patula</i> (Ref. 104981).
Association remarks	
Parasitism	outside host (<i>Chelonibia patula</i> is found on the crab's carapace (Ref. 104981).) inside host (All species are endoparasitic except <i>Chelonibia patula</i> (Ref. 104981).)

Feeding

feeding type	plants/detritus+animals (troph. 2.2-2.79)					
feeding type ref	de Lestang, S., I.C. Platell and M.E. Potter, 2000					
feeding habit	hunting macrofauna (predator)					
feeding habit ref	de Lestang, S., I.C. Platell and M.E. Potter, 2000					
trophic level(s)		original sample		unfished population		Remark
estimation method		Troph	s.e.	Troph	s.e.	
From diet composition		2.48	0.19			Troph of juv./adults.
Ref.	de Lestang, S., I.C. Platell and M.E. Potter, 2000					
From individual food items		3.54	0.46			Trophic level estimated from a number of food items using a randomized resampling routine.

3) Diet

Food and Feeding Habits: Diet Composition *Portunus pelagicus*

n = 35

Main Food	Percent	Trophic Level (y)	Predator Life Stage	Country	Locality	Ref.
detritus	59	2.5	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	59	2.5	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	59	2.5	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	59	2.5	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	59	2.5	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	59	2.5	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
detritus	55	2.6	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747

zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	33	3.1	juv./adults	Australia	Leschenault estuaries (33°12'South and 115°40'East)	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747
zoobenthos	29	3.2	juv./adults	Australia	Peel-Harvey (32°40'South, 115°40'East), Australia	8747

4) Reproduction

Main Ref.	Ruppert, E.E., R.S. Fox and R.D. Barnes, 2004
Mode	dioecism
Fertilization	
Spawning Frequency	two seasonal peaks per year
Batch Spawner	No
Reproductive Guild	bearers External brooders
Description of life cycle and mating behavior	Members of the order Decapoda are mostly gonochoric. Mating behavior: Precopulatory courtship ritual is common (through olfactory and tactile cues); usually indirect sperm transfer.
Search for more references on reproduction	Scirus

5) Maturity

Maturity studies for *Portunus pelagicus*

n = 10

Lm vs Linf graph

Lm (cm)	Length (cm)		Age range (y)		tm (y)	Sex of fish	Country	Locality
	7.9	-	9.0	-		mixed	Australia	Moreton Bay
	7.0	-	8.0	-		unsexed	Qatar	Doha
	3.2	-		-		female	Iran	Bandar Abbas, Hormozgan / 2006-2007
	6.0	-	6.5	-		mixed	Oman	Gulf of Oman and Arabian Sea / 2011-2012
4.4 CL		-		-		female	India	Kakinada/ Jan 1979-Dec 1980
7.5 CW	5.8	-		-		female	Thailand	Kung Krabaen Bay/ 2008-2009
7.5 CW	5.8	-		-		female	Thailand	Kung Krabaen Bay, Chanthaburi / 2008-2009
9.6 CW		-		-		unsexed	India	Karnataka/ 2011-2012
9.6 CW		-		-		female	India	Karnataka / 2001-2005
12.0 CW		-		-		mixed	Indonesia	Kendari Bay / 2016-2016

6) Spawning

Spawning for *Portunus pelagicus*

n = 9

J	F	M	A	M	J	J	A	S	O	N	D	Country	Locality
2	3	0	3	3	3	3	3	2	2	2	3	Iran	Bandar Abbas, Hormozgan
				111							111	Indonesia	Bone Bay, Sulawesi
111	111	111					111	111	111		111	Qatar	Doha
111								111	111	111	111	India	Kakinada/ Jan 1979-Dec 1980
111	111	111	111	111	111	111	111	111	111	111	111	India	Karnataka
111	111	111	111	111	111	111	111	111	111	111	111	India	Kerala
3	3	6	2	1	1	3	4	2	3	2	4	Thailand	Kung Krabaen Bay, Chanthaburi
111	111	111	111	111	111	111	111	111	111	111	111	Indonesia	Pangkep
111	111	111	111	111	111	111	111	111	111	111	111	India	Tuticorin

7) Spawning aggregation

(NA)

8) Fecundity

Fecundity for *Portunus pelagicus*
n = 5

Country	Locality	Absolute Fecundity			Relative Fecundity			Fecundity/length relationship	
		Min	Max	Mean	Min	Max	Mean	a	b
Australia	Moreton Bay	103,000	1,880,000	0				431.51	3.145
India	Palk Bay	60,000	1,976,398	0					
Iran	Bandar Abbas, Hormozgan	277,421	1,114,348	662,978					
Qatar	Doha	150	450,000	0				0.782	2.78
Thailand	Kung Krabaen Bay, Chanthaburi	148,237	1,448,180	572,138					

9) Eggs

The eggs are fertilised by the stored sperm and, when laid, they attach to hairs in a spongy mass under the female's abdomen. The eggs go from orange to black as they mature. The term for a female crab carrying egg clusters in this way is 'berried'. Any berried females caught by fishers must be returned to the water. The female incubates the eggs for about 18 days. When the embryos inside are mature she shakes the eggs off her abdomen and they hatch into zoea

10) Egg development

(NA)

11) Age/Size

List of Population Characteristics records for *Portunus pelagicus*
n = 32

Sex	Wmax	Lmax (cm)	Tmax (y)	Country	Locality
unsexed		7		Philippines	central Visayan region
female		7.4		Indonesia	Brebes coast, central Jawa
male		7.5		Indonesia	Brebes coast, central Jawa
male	675.00 g	9.2		Oman	Gulf of Oman and Arabian Sea / 2011-2012
female	730.00 g	9.6		Oman	Gulf of Oman and Arabian Sea / 2011-2012
female		9.989		Indonesia	PGN Bay, Labuhan Maringgai, East Lampung
female	136.70 g	10.1		Bahrain	Barbar, 2004-2005
male	227.69 g	11.5		Bahrain	Barbar, 2004-2005
male		12.08		Indonesia	PGN Bay, Labuhan Maringgai, East Lampung
unsexed		12.5		India	Karnataka/ 2011-2012
unsexed		13		India	Kerala/ 2011-2012
unsexed		14		India	Kerala/ 2012-2013

male		14.77		Indonesia	Lasongko Bay, central Buton / 2013-2014
female		14.83		Indonesia	Pati coast, central Jawa / 2012-2013
male		15.94		Indonesia	Pati coast, central Jawa / 2012-2013
unsexed		16		India	Karnataka and Goa
unsexed		16		India	Thoppukadu / 1995-1998
male		16		Bahrain	Unspecified, Bahrain
female		16.22		Indonesia	Lasongko Bay, central Buton / 2013-2014
male		16.5		India	Karnataka / 2001-2005
male	270.83 g	16.7		India	Karnataka / 1992-1994
female		17		India	Karnataka / 2001-2005
unsexed	409.00 g	17		Pakistan	Pakistan coastline, 2015-2015
unsexed		17.3		Iran	Bandar Abbas, Hormozgan / 2006-2007
female	317.26 g	17.3		India	Karnataka / 1992-1994
unsexed		18		India	Gulf of Mannar, Mandapam / 1995-1998
unsexed		18.2		India	Devipattinam / 1995-1998
female		18.5		Australia	Unspecified, Australia
male	420.00 g	18.6		China	Beibu Gulf, Hainan Islands, South China Sea, Mar 1997-Apr 1999

12) Growth

Growth parameters for *Portunus pelagicus*

Maximum Length 20cm CW n = 52

Note that studies where Loo is very different (+/- 1/3) from Lmax are doubtful.

Auximetric graph [n = 45]

Lm vs Linf graph [n = 8]

M vs K graph [n = 38]

M vs Linf graph [n = 38]

 $\phi = 2.61$ **L inf** = 17.0 cm CW**K** = 1.4

Median record no. 27

Ref. 116321

Loo (cm)	Length Type	K (1/y)	to	Sex	M (1/y)	Temp° C	Lm	Ø'	Country	Locality	Questionable	Captive
5.90	CL	1.900						1.82	Pakistan	Bhanbhore	Yes	Yes
8.11	CL	0.780		F	1.53			1.71	Indonesia	Brebes coast, central Jawa	No	No
8.14	CL	1.200		M	1.53			1.90	Indonesia	Brebes coast, central Jawa	Yes	No

10.28	CL	1.850		M	3.15			2.29	Oman	Gulf of Oman and Arabian Sea	No	No
10.96	CL	1.680		F	3.15			2.30	Oman	Gulf of Oman and Arabian Sea	No	No
11.91	CW	3.110	0.25	M				2.64	Australia	Leschenault Estuary and Koombana Bay	No	No
12.47	CW	2.670	0.25	F				2.62	Australia	Leschenault Estuary and Koombana Bay	Yes	No
12.59	CW	2.820	1.70					2.65	Australia	Peel-Harvey Estuary	Yes	No
12.89	CW	0.100	0.10					1.22	Australia	Peel-Harvey Estuary	Yes	No
13.10	CL	1.420						2.39	Pakistan	Miani Hor	No	Yes
14.26	CW	2.750		M	3.98			2.75	Thailand	Kung Krabaen Bay	No	Yes
14.26	CW	2.750		M	3.98			2.75	Thailand	Kung Krabaen Bay, Chanthaburi	No	No
14.80	CL	1.730						2.58	Pakistan	Korangi Creek	No	Yes
15.00	CW	2.370						2.73	Qatar	Doha	No	Yes
15.20	CW	0.930	- 0.96	M	1.09			2.33	Indonesia	Lasongko Bay, central Buton	No	No
15.27	CW	1.500	0.57					2.54	Australia	Cockburn Sound	No	No
15.40	CW	1.090	- 0.09	F	1.21	29.00	7.16300	2.41	Indonesia	Bone Bay, Sulawesi	No	No
15.57	CW	3.000	0.10					2.86	Australia	Peel-Harvey Estuary	No	No
15.90	CW	1.270	- 0.08	M	1.33	29.00	7.16300	2.51	Indonesia	Bone Bay, Sulawesi	No	No
15.90	CW	2.630						2.82	Qatar	Doha	No	Yes
16.30	CW	1.500	0.59				9.60000	2.60	India	Karnataka and Goa	No	No
16.73	CW	1.130		F	2.07		7.52000	2.50	Thailand	Kung Krabaen Bay	No	Yes
16.73	CW	1.130		F	2.07		7.52000	2.50	Thailand	Kung Krabaen Bay, Chanthaburi	No	No

16.80	CW	1.200	- 0.04	M	1.21	26.32		2.53	Iran	Bandar Abbas, Hormozgan	No	No
16.90	CW	1.700		M	2.50			2.69	India	Tamil Nadu	No	No
16.90	CW	1.300	- 0.04	M	2.20			2.57	India	Karnataka	Yes	No
17.00	CW	1.400		F	1.50			2.61	India	Tamil Nadu	No	No
17.00	CW	1.400	- 0.04	F	2.20			2.61	India	Karnataka	No	No
17.10	CW	1.600	- 0.04	F	1.61			2.67	Thailand	Trang Province	No	No
17.30	CW	1.300	- 0.08		2.50		9.60000	2.59	India	Karnataka	No	No
17.30	CW	0.680	- 0.84	F	0.86			2.31	Indonesia	Lasongko Bay, central Buton	No	No
17.38	CW	1.200	- 0.08	M	1.44			2.56	Indonesia	Pangkep	No	Yes
17.40	CW	1.600			1.54			2.69	India	Karnataka and Goa	No	Yes
17.61	CW	1.300			2.54			2.61	Philippines	Sorsogon Bay	No	Yes
17.79	CW	1.100	- 0.04	F	1.13			2.54	Iran	Bandar Abbas, Hormozgan	No	No
17.90	CW	1.500	- 0.04	M	1.61			2.68	Thailand	Trang Province	No	No
18.20	CW	0.910			1.07			2.48	Indonesia	Kendari Bay	Yes	No
18.50	CW	1.600		F	1.42			2.74	Iran	Persian Gulf and Oman Sea	No	No
18.50	CW	1.260	- 0.00	M	1.27			2.63	Indonesia	Pati coast, central Jawa	No	No
18.64	CW	1.500	- 0.06	F	1.27			2.72	Indonesia	Pangkep	No	Yes
18.70	CW	1.130	- 0.00	F	1.18			2.60	Indonesia	Pati coast, central Jawa	No	No
19.10	CW	1.700		M	1.47			2.79	Iran	Persian Gulf and Oman Sea	No	No
19.50	CW	0.840		F				2.50	Philippines	Panay	No	Yes
19.50	CW	1.600		M	2.50		9.30000	2.78	India	Tuticorin	No	No
19.51	CW	1.000		F	2.11	29.00		2.58	India	Palk Bay and Gulf of Mannar	No	No
20.00	CW	0.870		M				2.54	Philippines	Panay	No	Yes
20.40	CW	0.970	- 0.07	F	1.60			2.61	India	Karnataka	No	No
20.98	CW	0.840			1.82			2.57	Philippines	San Miguel Bay	No	Yes

21.00	CW	1.300		F	2.00		11.80000	2.76	India	Tuticorin	No	No
21.10	CW	1.140	0.09	M	1.70			2.71	India	Karnataka	No	No
21.36	CW	0.870			1.85			2.60	Philippines	San Miguel Bay	No	No
22.30	CW	0.950		M	2.72	29.00		2.67	India	Palk Bay and Gulf of Mannar	No	No

13) Length-weight

Length-Weight Parameters for *Portunus pelagicus*

Length-weight (a vs b) graph	[n=58]	Median Record No. 30 a = 0.1326 cm CW b = 2.9864 Ref. 117381
------------------------------	--------	--

a	b	Doubtful?	Sex	Length (cm)	Length type	No.	Country	Locality
1.8368	1.720	Yes	male		CW	389	Philippines	Panay / 2002-2002
1.2035	1.850	Yes	female		CW	366	Philippines	Panay / 2002-2002
0.0216	2.340	Yes	male		CL	60	China	Hainan Island, North Bay / 1997-1999
0.9672	2.440	Yes	male		CL	419	Pakistan	Sindh and Balochistan coasts / 2015-2015
1.2974	2.511	Yes	male	3.2 - 6.1	CL	27	Egypt	Lake Timsah / 2014-2014
0.2040	2.560	No	male		CW	419	Pakistan	Sindh and Balochistan coasts / 2015-2015
0.3600	2.567	No	male		CW		Qatar	Ras Rakan to Al Wakrah / 2014-2014
0.2600	2.665	No	female		CW		Qatar	Ras Rakan to Al Wakrah / 2014-2014
0.9796	2.690	Yes	female	3.4 - 5.7	CL	77	Egypt	Lake Timsah / 2014-2014
0.3478	2.719	No	male	4.5 - 15.4	CW	170	India	Kakinada / 1979-1980
0.5248	2.720	Yes	female	7.1 - 11.8	CW	77	Egypt	Lake Timsah / 2014-2014
0.2171	2.725	No	mixed	4.5 - 15.4	CW	340	India	Kakinada / 1979-1980
0.2888	2.730	No	mixed		CL	897	Pakistan	Sindh and Balochistan coasts / 2015-2015
0.1120	2.748		female		CW	348	Iran	Bandar Abbas, Hormozgan / 2006-2007
0.1143	2.757		male		CW	424	Iran	Bandar Abbas, Hormozgan / 2006-2007
0.1198	2.790	No	mixed	7.0 - 17.0	CW	897	Pakistan	Sindh and Balochistan coasts / 2015-2015
0.1694	2.839	No	female	4.9 - 15.4	CW	170	India	Kakinada / 1979-1980
0.0855	2.860		female		CW	859	Indonesia	Kendari Bay / 2016-2016
0.8845	2.868		female	3.9 - 9.6	CL	414	Oman	Gulf of Oman and Arabian Sea / 2011-2012
0.1568	2.894	No	female		CW		Thailand	Kung Krabaen Bay / 2008-2009

0.0784	2.894		female		CW		Thailand	Kung Krabaen Bay, Chanthaburi / 2008-2009
1.1700	2.910	No	male		CW		Philippines	San Miguel Bay / 2011-2012
0.9670	2.910	No	female		CL	478	Pakistan	Sindh and Balochistan coasts / 2015-2015
0.0834	2.921		male		CW		Thailand	Kung Krabaen Bay, Chanthaburi / 2008-2009
0.1668	2.921	No	male		CW		Thailand	Kung Krabaen Bay / 2008-2009
1.2100	2.940	No	mixed		CW		Philippines	San Miguel Bay / 2011-2012
0.8138	2.950	No	female		CW	478	Pakistan	Sindh and Balochistan coasts / 2015-2015
1.2500	2.970	No	female		CW		Philippines	San Miguel Bay / 2011-2012
0.9333	2.970	Yes	male	6.4 - 11.8	CW	27	Egypt	Lake Timsah / 2014-2014
0.1326	2.986	No	female	2.6 - 14.8	CW	260	Pakistan	Pakistan coast / 2004-2005
0.8212	3.000	No	female		CL	10	Iran	Persian Gulf / 2009-2009
0.8559	3.000	No	male		CL	8	Iran	Persian Gulf / 2009-2009
1.0000	3.000	No	female	3.4 - 7.0	CL	56	Egypt	Lake Bardaweel / 2014-2014
0.1302	3.009	No	mixed	2.3 - 14.8	CW	540	Pakistan	Pakistan coast / 2004-2005
0.1312	3.028	No	male	2.3 - 13.5	CW	280	Pakistan	Pakistan coast / 2004-2005
0.0679	3.056	No	female		CW	1076		Peel-Harvey estuary (32°32' S, 115°43' E) / 1980-1981
0.1148	3.110	No	male	5.2 - 11.5	CW	163	Bahrain	Barbar / 2004-2005
1.3490	3.130	No	female	7.0 - 13.5	CW	56	Egypt	Lake Bardaweel / 2014-2014
0.0605	3.132	No	mixed		CW	80	China	Hainan Island, North Bay / 1997-1999
0.1422	3.153	No	male	3.2 - 7.2	CL	56	Egypt	Lake Bardaweel / 2014-2014
0.4510	3.177		male	2.7 - 9.2	CL	584	Oman	Gulf of Oman and Arabian Sea / 2011-2012
0.0425	3.186		female		CW		Thailand	Trang Province / 2006-2007
0.1016	3.213	No	female		CW	70	China	Hainan Island, North Bay / 1997-1999
0.0404	3.219		male		CW		Thailand	Trang Province / 2006-2007
0.0285	3.221		female		CW	158	India	Karnataka / 2001-2005
0.0292	3.253		female	8.0 - 17.3	CW	106	India	Karnataka / 1992-1994
0.0356	3.259		female		CW		Indonesia	Pati coast, central Jawa / 2012-2013
0.0466	3.260	No	male		CW	694		Peel-Harvey estuary (32°32' S, 115°43' E) / 1980-1981
0.1820	3.284	No	mixed		CL	70	China	Hainan Island, North Bay / 1997-1999
0.0555	3.310		male		CW	784	Indonesia	Kendari Bay / 2016-2016

0.1976	3.330	No	female		CL	60	China	Hainan Island, North Bay / 1997-1999
0.0220	3.342		male		CW		Indonesia	Pati coast, central Jawa / 2012-2013
1.8100	3.360	No	mixed	3.6 - 17.0	CW		Philippines	Unspecified
0.0234	3.366	No	unsexed		CW		India	Karnataka and Goa
0.0597	3.404	No	male		CW	70	China	Hainan Island, North Bay / 1997-1999
2.7542	3.440	No	male	5.9 - 13.6	CW	54	Egypt	Lake Bardaweel / 2014-2014
0.0201	3.486		male		CW	156	India	Karnataka / 2001-2005
0.0132	3.617		male	8.1 - 16.7	CW	111	India	Karnataka / 1992-1994

14) Length-length

Length-length Parameters for *Portunus pelagicus*
n=12

Unknown length	a	b	Known length	r	Length range (cm)			Sex of fish
CL	0.208	0.593	CW	0.97		-		male
CL	0.091	0.619	CW	0.96		-		female
CW	0.156	0.480	CL	0.87		-		male
CW	0.048	0.490	CL	0.9		-		female
CW	0.008	0.500	CL	0.92		-		female
CW	0.014	0.510	CL	0.95		-		male
CW	1.139	1.564	CL	0.92957	2.2	-	9.3	male
CW	0.499	1.640	CL	0.962393	2.7	-	8.5	female
CW	0.973	1.952	CL	0.983	2.7	-	9.2	male
CW	0.882	1.979	CL	0.984	3.9	-	9.6	female
OT	-0.269	0.848	CW	0.99		-		female
OT	-0.525	0.884	CW	0.99		-		male

15) Length-frequencies

(NA)

16) Morphometrics

(NA)

17) Morphology

(NA)

18) Larvae

(NA)

19) Recruitment

A term used by researchers to describe the addition of crabs or fish (juvenile or of legal size) to a population, either by reproduction or migration. Levels of recruitment of adult crabs to WA's blue

swimmer crab populations fluctuate considerably. A range of environmental factors – including water temperature variations, the relative strength of wind and current systems, and the amount and timing of rainfall – can affect the survival and growth rates of crab larvae and juveniles. This in turn leads to big fluctuations in the available crab harvest from time to time. Estuaries along WA's west coast, including the PeelHarvey near Mandurah, are under pressure from rapid population growth. This includes increases in recreational and commercial fishing activity, urban development and associated environmental change, which may also affect crab recruitment.

20) Abundance

References

References Used for *Portunus pelagicus*

1. Afzaal, Z., M.A. Kalhor, M.A. Buzdar, S. Tariq, M. Shafi, A. Nadeem, S. Imran, F. Saeed, M. Sohail, R. Hassan, A. Haroon, H. Shah and I. Ahmed 2018 Carapace length-weight and carapace width-weight relationship of *Portunus pelagicus* (Linnaeus, 1758) in Pakistani waters northern Arabian Sea. *Indian J. Geo Mar. Sci.* 47(4):890-896.
2. Ahmed, M. and G. Abbas 2000 Growth parameters of the finfish and shellfish juveniles in the tidal waters of Bhanbhore, Korangi Creek and Miani Hor Lagoon. *Pakistan J. Zool.* 32(1):21-26.
3. Al-Rumaidh, M.J. 2002 The biology, population dynamics and fishery management of the blue swimming crab *Portunus pelagicus* (Linnaeus, 1758) in Bahareini waters: (Crustacea: Decapoda: Brachyura: Portunidae). University of Wales, Bangor.
4. Al-Yamani, F.Y., V. Skryabin, N. Boltachova, N. Revkov, M. Makarov, V. Grinstov and E. Kolesnikova 2012 Illustrated Atlas on the Zoobenthos of Kuwait. Kuwait Institute for Scientific Research.
5. Aljehdali, H. 2013 Arabic names for invertebrates. Pers. Comm. via email.
6. Anam, R. and E. Mostarda 2012 Field identification guide to the living marine resources of Kenya. *FAO Species Identification Guide for Fishery Purposes*, Rome: FAO, 357 p.
7. Balasaraswathy, N., G. Sugumar, A. Selvan, U. Ramesh and P. Velayutham 2008 Changes in quality characteristics of cooked and uncooked crab meat (*Portunus pelagicus*) under ice storage. *Asian Fisheries Science* 21:101-112.
8. Bartley, D.M. (comp./ed.) 2006 Introduced species in fisheries and aquaculture: information for responsible use and control (CD-ROM). Rome, FAO.
9. Bisby, F.A., M.A. Ruggiero, K.L. Wilson, M. Cachueta-Palacio, S.W. Kimani, Y.R. Roskov, A. Soulier-Perkins and J. van Hertum 2005 Species 2000 & ITIS Catalogue of Life: 2005 Annual Checklist. CD-ROM; Species 2000: Reading, U.K.
10. Black, R., A.I. Robertson, C.H. Peterson and N.M. Peterson 1990 Fishes and benthos of near-shore seagrass and sandflat habitats at Monkey Mia Shark Bay, Western Australia. pp245-261 In Berry PF, Bradshaw SD, Wilson BR, editors. *Research in Shark Bay: Report of the France-Australe Biocentenary Expedition Committee*, Perth: Western Australia Museum.
11. Carpenter, K.E., F. Krupp, D.A. Jones and U. Zajonz 1997 *FAO species identification guide for fishery purposes. The living marine resources of Kuwait, Eastern Saudi Arabia, Bahrain, Qatar, and the United Arab Emirates*. Rome, FAO. 293 p. 17 colour plates.
12. Cheung, W.L., R. Watson and D. Pauly 2013 Signature of ocean warming in global fisheries catch. *Nature* 497:365-368.
13. Chou, W-R., S-H. Lai and L-S. Fang 1999 Benthic crustacean communities in waters of southwestern Taiwan and their relationships to environmental characteristics. *Acta Zoologica* 10(1):25-33.
14. CMFRI 2012 Annual report 2011-2012. Central Marine Fisheries Research Institute, Cochin. 274 p.
15. CMFRI 2014 Annual report 2013-2014. Central Marine Fisheries Research Institute, Cochin. 274 p.
16. CMFRI 2015 Annual report 2014-15. Central Marine Fisheries Institute, Cochin. 353 p.
17. CMFRI 2016 Annual report 2016-17. Central Marine Fisheries Research Institute, Kochi. 345 p.
18. CMFRI 2017 Annual Report 2016-17. Central Marine Fisheries Research Institute, Kochi, 292 p.
19. CRUSTA 2012 Species from French Polynesia (Marquesas, Society, Austral, Tuamotu, Gambier). <http://crustiesfroverseas.free.fr/files.php?ile=Polynes> [Accessed 21/07/2014].
20. DAISIE 2016 *Portunus pelagicus*. DAISIE European Invasive Alien Species Gateway. Available from: <http://www.europe-alien.org/speciesFactsheet.do?speciesId=100782> [Accessed 14th September 2016].
21. de Lestang, S., I.C. Platell and M.E. Potter 2000 Dietary composition of the blue swimmer crab *Portunus pelagicus* L. Does it vary with body size and shell state and between estuaries? *Journal of Experimental Marine Biology and Ecology* 246:241-257.
22. de Lestang, S., N. Hall and I.C. Potter 2003 Influence of a deep artificial entrance channel on the biological characteristics of the blue swimmer crab *Portunus pelagicus* in a large microtidal estuary. *Journal of Experimental Marine Biology and Ecology* 295:41-61.
23. de Lestang, S., N.G. Hall and I.C. Potter 2003 Do the age compositions and growth of the crab *Portunus pelagicus* in marine embayments and estuaries differ? *Journal of the Marine Biological Association of the United Kingdom* 83:971-978.
24. del Mundo, C.M. 2000 Philippine decapod crustacea. An illustrated handbook on the commercially important decapod crustacea of the Philippines. Fisheries Resources Evaluation and Environmental Services Division, Bureau of Fisheries and Aquatic Resources. Quezon City, Philippines. 83 p.

25. del Norte-Campos, A.G.C. and K.A. Villarta 2008 Population biology of the portunid crabs *Portunus pelagicus* (Linnaeus, 1758) and *Charybdis feriatus* (Linnaeus, 1758) in Pilar and Capiz bays, northern Panay, Philippines. *UPV J. Nat. Sci.* 13:71-86.
26. Dineshababu, A.P., B. Sreedhara and Y. Muniyappa 2008 Biology and exploitation of the blue swimmer crab, *Portunus pelagicus* (Linnaeus, 1758), from south Karnataka coast, India. *Indian Journal of Fisheries* 55(3):215-220.
27. Elahi, M., A. Esmaili-Sari and N. Bahramifar 2012 Total mercury levels in selected tissues of some marine crustaceans from Persian Gulf, Iran: variations related to length, weight and sex. *Bulletin of environmental contamination and toxicology* 88(1):60-64.
28. Ernawati, T. 2013 Population dynamics and stock assessment of blue swimmer crab (*Portunus pelagicus* Linnaeus) resource in Pati and adjacent waters. M.S. thesis, Bogor Agricultural University, Bogor, Indonesia, 80p.
29. Estampador, E.P. 1959 Revised list of Philippine crustacean decapods. *Nat. Appl. Sci. Bull.* 17:1-125.
30. FAO 2012 Species Fact Sheets: *Portunus pelagicus* (Linnaeus, 1758). <http://www.fao.org/fishery/species/2629/en> [Accessed: 17/10/12].
31. FAO-FIES 2007 Aquatic Sciences and Fisheries Information System (ASFIS) species list. Retrieved from <http://www.fao.org/fishery/collection/asfis/1/en>, [accessed 03/07/2008].
32. FAO-FIES 2008 Aquatic Sciences and Fisheries Information System (ASFIS) species list. Retrieved from <http://www.fao.org/fishery/collection/asfis>, 29 April 2008.
33. FAO-FIES 2017 Aquatic Sciences and Fisheries Information System (ASFIS) species list. Retrieved from <http://www.fao.org/fishery/collection/asfis/en> (accessed 08/06/2017).
34. Fishelson, L. 1971 Ecology and distribution of the benthic fauna in the shallow waters of the Red Sea. *Mar. Biol.* 10:113-133.
35. George, D. 2005 Marine invertebrates. pp. 197-220 In Hellyer, P.; Aspinall, S. (eds) *The Emirates: a natural history*. Trident Press: Chicago.
36. Giraldes, B.W., I. Al-Maslmani, A. Al-Ashwel, M. Chatting and D. Smyth 2016 Basic assessment of *Portunus segnis* (Forskål, 1775) - A baseline for stock management in the Western Arabian Gulf. *The Egyptian Journal of Aquatic Research* 42(1):111-119.
37. Hamid, A. and Y. Wardiatno 2015 Population dynamics of the blue swimming crab (*Portunus pelagicus* Linnaeus, 1758) in Lasongko Bay, Central Buton, Indonesia. *Aquaculture, Aquarium, Conservation & Legislation* 8(5):729-739.
38. Holthuis, L.B. 1987 Vrais Crabes. 321-333. In W. Fisher, M. Schneider and M.L. Bauchot (eds). *Fiches FAO d'identification des espèces pour les besoins de la pêche Méditerranée et Mer Noire Zone de pêche 37 Révision 1 Vol. 1 Végétaux et invertébrés*. FAO, Rome.
39. Hosseini, S.H. 2009 The intertidal decapods of Bushehr, northern part of the Persian Gulf. *Iranian Journal of Fisheries Sciences* 8(1):37-46.
40. Ihsan, W.E., S.H. Wisudo and J. Haluan 2014 A study of biological potential and sustainability of swimming crab population in the waters of Pangkep Regency South Sulawesi Province. *International Journal of Sciences: Basic Appl. Res.* 16:351-363.
41. Ikhwanuddin, M., A.N. Liyana, M.N. Azra, Z. Bachok and A.B. Abol-Munafi 2014 Natural diet of blue swimming crab, *Portunus pelagicus* at Strait of Tebrau, Johor, Malaysia. *Sains Malaysia* 43(1):37-44.
42. Josileen J. and Menon N.G. 2007 Fishery and growth parameters of the blue swimmer crab *Portunus pelagicus* (Linnaeus, 1758) along the Mandapam Coast, India. *Journal of the Marine Biological Association of India* 49(2):159-165.
43. Josileen, J. 2011 Food and feeding of the blue swimmer crab, *Portunus pelagicus* (Linnaeus, 1758) (Decapoda, Brachyura) along the Coast of Mandapam, Tamil Nadu, India. *Crustaceana* 84(10):1169-1180.
44. Josileen, J. 2013 Fecundity of the blue swimmer crab, *Portunus pelagicus* (Linnaeus, 1758) (Decapoda, Brachyura, Portunidae) along the coast of Mandapam, Tamil Nadu, India. *Crustaceana* 86(1):48-55.
45. Kamrani, E., A.N. Sabili and Y. Maziar 2010 Stock assessment and reproductive biology of the blue swimming crab, *Portunus pelagicus* in Bandar abbas coastal waters, Northern Persian Gulf. *J. Persian Gulf* 1(2):11-22.
46. Karbhari, J.P. 1982 Scientific, common and local names of commercially important marine fishes and shell fishes of Maharashtra and Gujarat coasts. *Marine Fisheries Information Service, Technical and Extension Series*, 44:18-23.
47. Kembaren, D.D., T. Ernawati and Suprpto 2012 Biologi dan parameter populasi rajungan (*Portunus pelagicus*) di perairan Bone dan sekitarnya. *J. Lit. Perikan. Ind.* 18(4):273-281.
48. Kilada, R. and N.K. Ibrahim 2016 Preliminary investigation of direct age determination using band counts in the gastric mill of the blue swimmer crab (*Portunus pelagicus*) in two salt-water lakes in the eastern Mediterranean. *Journal of Crustacean Biology* 36(2):119-128.
49. Kolhe, S.S. and H.S. Mogalekar 2017 Decapod crustacean diversity of Ratnagiri coastal waters, Maharashtra, India. *Journal of Entomology and Zoology Studies* 5(3):370-372.
50. Koror Republic of Palau. 2012 The Rock Islands Southern Lagoon. http://www.google.com/url?sa=t&rect=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CCkQFjAC&url=http%3A%2F%2Fwww.palaupanfund.org%2Fpdf%2Fmanagementplan%2Fkoror%2FRock%2520Islands%2520Southern%2520Lagoon%2520Area%2520Management%2520Plan%25202012-2016%2520latest%2520July%252018.pdf&ei=HKOcVZ6LMNjr8AXEuKzwCA&usq=AFQjCNFN07tAwxC1s67J47zoXSQImcfNmg&sig2=z7WlKekW7DHqs_11pn39ZA&bvmbv=96952980,d.dGc [Accessed 08/07/2015].
51. Kunsook, C. 2011 Assessment of stock and movement pattern for sustainable management of blue swimming crab *Portunus pelagicus* (Linnaeus, 1758): case study in Kung Krabaen Bay, Chanthaburi Province, Thailand. Ph.D. thesis, Chulalongkorn University, Bangkok, Thailand, 166p.
52. Kunsook, C., N. Gajaseni and N. Paphavasit 2014 A stock assessment of the blue swimming crab *Portunus pelagicus* (Linnaeus, 1758) for sustainable management in Kung Krabaen Bay, Gulf of Thailand. *Tropical Life Sciences Research* 25(1):41-59.
53. Kurnia, R., M. Boer and Zairion 2014 Population biology of *Portunus pelagicus* and its essential habitat characteristics in order to propose nursery ground conservation in East Lampung. *Jurnal Ilmu Pertanian Indonesia* 19(1):22-28.
54. Lai, J.C.Y., P.K.L. Ng and P.J.F. Davie 2010 A revision of the *Portunus pelagicus* (Linnaeus, 1758) species complex (Crustacea: Brachyura: Portunidae), with the recognition of four species. *The Raffles Bulletin of Zoology* 58(2):199-237.
55. Lalitha Devi, S. 1985 The fishery and biology of crabs of Kakinada Region. *Indian J. Fish* 32(1):18-32.

56. Le Vay, L., and M. Falamarzi 2009 Population biology and inshore fishery assessment for the blue swimming crab, *Portunus pelagicus*. Doha, Qatar.
57. Macbeth, W.G. and C.A. Gray 2008 Differences in catch composition among types of commercial penaeid-seining operations in an Australian estuary. *Asian Fisheries Science* 21:339-353.
58. Macintosh, D. J., E. C. Ashton and V. Tansakul 2002 Utilisation and knowledge of biodiversity in the Ranong Biosphere Reserve, Thailand. ITCZM monograph series (7): 29.
59. MarineSpecies.org 2050 MarineSpecies.org. <http://www.marinespecies.org/index.php>
60. Mehanna, S.F., S. Khvorov, M. Al-Sinawy, Y.S. Al-Nadabi and M.N. Al-Mosharafi 2013 Stock assessment of the blue swimmer crab *Portunus pelagicus* (Linnaeus, 1766) from the Oman coastal waters. *International Journal of Fisheries and Aquatic Sciences* 2(1):1-8.
61. Ming, C.L. 1988 A Guide to the Coral Reef Life of Singapore. Singapore Science Centre, pp. 1-117.
62. Ministry of Fisheries and Aquatic Resources 2010 Major marine fish types by commercial group. <http://www.fisheries.gov.lk>.
63. Motoh, H. 1980 Field guide for the edible crustacea of the Philippines. Southeast Asian Fisheries Development Center (SEAFDEC). Aquaculture Department, Iloilo, Philippines.
64. Ng, P.K. and N. Sivasothi 1999 Guide to the Mangroves of Singapore II (Animal Diversity). Singapore Science Centre, pp. 1-158.
65. Ng, P.K.L. 1998 Crabs. p. 1045-1155. In K.E. Carpenter and V.H. Niem (eds) FAO species identification guide for fishery purposes. The living marine resources of the Western Central Pacific. Volume 2. Cephalopods, crustaceans, holothurians and sharks. Rome, FAO. 1998. pp. 687-1396.
66. Nieves, P.M., N.R. Olfindo and A.M. Macale 2015 Stock assessment of Christian crabs (*Charybdis feriatus*, Linnaeus, 1758) in San Miguel Bay. In Resource Enhancement and Sustainable Aquaculture Practices in Southeast Asia: Challenges in Responsible Production of Aquatic Species: Proceedings of the International Workshop on Resource Enhancement and Sustainable Aquaculture Practices in Southeast Asia 2014 (RESA) (pp. 121-135). Aquaculture Department, Southeast Asian Fisheries Development Center.
67. Nieves, P.M., S. de Jesus, M.A.B. Guiriba, M.A.B. Macale, S. Belen and G. Corral 2013 Capture fisheries assessment of commercially important marine crabs in Sorsogon Bay and San Miguel Bay. *Kuroshio Science* 7(1):59-67.
68. Palomares, M.L.D., R. Froese, B. Derrick, S.-L. Noël, G. Tsui, J. Woroniak and D. Pauly 2018 A preliminary global assessment of the status of exploited marine fish and invertebrate populations. A report prepared by the Sea Around Us for OCEANA. The University of British Columbia, Vancouver, p. 64.
69. Potter, I.C., P.J. Chrystal and N.R. Loneragan 1983 The biology of the blue manna crab *Portunus pelagicus* in an Australian estuary. *Marine Biology* 78(1):75-85.
70. Potter, I.C., S. de Lestang and R. Melville-Smith 2001 The collection of biological data required for management of the blue swimmer crab fishery in the central and lower west coasts of Australia. Centre for Fish and Fisheries Research, Murdoch University, Murdoch, Australia, 56p.
71. Poupin, J. 1996 Crustacea Decapoda of French Polynesia (Astacidea, Palinuridea, Anomura, Brachyura). *Atoll Research Bulletin* 442:1-114.
72. Poupin, J. 2005 Systématique et ecologie de Crustacés Décapodes et Stomatopodes de Polynésie Française. Ecole Navale, Institut de Recherche de l'Ecole Navale IRENAV, Groupe de recherche SIG, BP 600, F-29240 BREST Armées.
73. Rao, C.V. 1991 Scientific, common and local names of commercially important edible marine fin and shell fishes from Andhra Pradesh. *Marine Fisheries Information Service* 108:1-10.
74. Rasheed, S. and J. Mustaqim 2014 Relative growth and morphometric measurements as an index for estimating meat yield of two edible crabs *Portunus pelagicus* and *P. sanguinolentus* from the coastal waters of Pakistan. *International Journal of Innovation and Applied Studies* 9(4):1994-2009.
75. Reef Life Survey 2012 Reef Life Survey. <http://reeflifesurvey.com/>
76. Ruppert, E.E., R.S. Fox and R.D. Barnes 2004 *Invertebrate Zoology. A functional evolutionary approach*. 7th Ed. Brooks/Cole, Thomson Learning learning, Inc. 990 p.
77. Safaie, M., J. Pazooki, B. Kiabi and M.R. Shokri 2013 Reproductive biology of blue swimming crab, *Portunus segnis* (Forsk., 1775) in coastal waters of Persian Gulf and Oman Sea, Iran. *Iranian Journal of Fisheries Science* 12(2):430-444.
78. Saifullah, S.M. 1997 Mangrove ecosystem of Red Sea coast (Saudi Arabia). *Pakistan Journal of Marine Sciences* 6(1&2):115-124.
79. Sawusdee, A. and A. Songrak 2011 Population dynamics and stock assessment of blue swimming crab (*Portunus pelagicus* Linnaeus, 1758) in the coastal area of Trang Province, Thailand. *Walailak Journal of Science and Technology (WJST)* 6(2):189-202.
80. Schreiber, A. and E. Cases 1984 Edible Crustacea of the Central Philippines. *The Philippine Scientist* 21:11-50.
81. Shields, J.D. 1992 Parasites and symbionts of the crab *Portunus pelagicus* from Moreton Bay, Eastern Australia. *Journal of Crustacean Biology* 12(1):94-100.
82. Shields, J.D. and F.E.I. Wood 1993 Impact of parasites on the reproduction and fecundity of the blue sand crab *Portunus pelagicus* from Moreton Bay, Australia. *Mar. Ecol. Prog. Ser.* 92:159-170.
83. Sienas, P.M.Q., D.A. Willette, L.R. Romena, C.G. Alvior and J.S. Estacion 2014 Genetic diversity and the discovery of putative cryptic species within a valued crab fishery, *Portunus pelagicus* (Linnaeus 1758) in the Philippines. *Philippine Science Letters* 7(2):317-323.
84. Strefataris, N. and A. Zenetos 2006 Alien marine species in the Mediterranean - the 100 'worst invasives' and their impact. *Mediterranean Marine Science* 7:87-118.
85. Sukumaran K.K. 1995 Fishery, biology and population dynamics of the marine crabs, *Portunus (Portunus) sanguinolentus* (Herbst) and *Portunus (Portunus) pelagicus* (Linnaeus) along the Karnataka Coast. Ph.D. thesis, School of Ocean Sciences, Karnataka University, Karwar, India, 403 p.
86. Suman, A., K. Amri, A.R.P. Pane and P. Lestari 2018 Population dynamic and exploitation rate of the blue swimming crab (*Portunus pelagicus*) in the Kendary Bay waters. *Indonesian Fisheries Research Journal* 24(1):61-67.

87. Sunarto 2012 Bioecology characteristics of blue swimming crab (*Portunus pelagicus*) in Bebes waters. Ph.D. thesis, Bogor Agricultural University, Bogor, Indonesia, 175p.
 88. Tan, C.G.S. and P.K.L. Ng 1994 An annotated checklist of mangrove brachyuran crabs from Malaysia and Singapore. *Hydrobiologia* 285:75-84.
 89. Tetra Tech EM Inc. 2010 Consolidated report: monitoring of the capture fisheries and marine protected areas (reef habitats) in the FISH project's focal areas: Coron Bay, Danajon Bank, Lanuza Bay, and Tawi-Tawi. USAID
 90. Vartak, V.R., R. Narasimmalu, P.K. Annam and W.S. Lakra 2015 DNA barcoding detected improper labelling and supersession of crab food served by restaurants in India. *Journal of the Science of Food and Agriculture* 95(2):359-366.
 91. Wang, H., H. Wu, Z. Wang, X. Wang and S. Wang 2001 Fisheries biology of *Portunus pelagicus* Linneis initialing investigation. *Marine Science* 25(1):36-39.
 92. Warfel, E. and P.R. Manacop 1950 Otter trawl explorations in Philippine waters. Research Report 25, Fish and Wildlife Service, U.S. Dept. Int., Washington, D.C.
 93. Williams, M.J. 1982 Natural food and feeding in the commercial sand crab *Portunus pelagicus* Linnaeus, 1766 (Crustacea: Decapoda: Portunidae) in Moreton Bay, Queensland. *J. Exp. Mar. Biol. Ecol.* 59:165-176.
 94. Yambao, A.C., A.T. White, W.E. Ablong and M.R. Alcalá 2001 Coastal environmental profile of Negros Oriental, Philippines. Cebu City : Coastal Resource Management Project of the Dept. of Environment and Natural Resources, xii, 107 p. : ill. (some col.), maps (some col.) ; 28 cm.
 95. Ye, S. 2004 Species composition and distribution characteristics of crab on Minnan-Taiwan bank fishing grounds. *Marine Fisheries* 26(4):249-254.
 96. Zainal, K.A. 2017 Relative growth and heterochely in the blue swimmer crab *Portunus pelagicus* (Linnaeus 1758) from the Kingdom of Bahrain. *Arabian Journal for Science and Engineering* 42(1):75-84.
 97. Zheng, Y., X. Chen, J. Chen, Y. Wang, X. Shen, W. Chen and C. Li 2003 Biological resources and the environment in East China Sea. Scientific Technology Publishing of Shanghai, 835 p.
 98. Zipcodezoo.com 2015 *Portunus pelagicus*. http://zipcodezoo.com/index.php/Portunus_pelagicus [Accessed 10/27/2015].
 99. Craig, John F. (2016-01-12). *Freshwater Fisheries Ecology*. Wiley. pp. 57-. ISBN 9781118394403. Retrieved 2 November 2017.
 100. [^] Lai, Joelle C Y; Ng, Peter K L; Davie, Peter J F (2010). "A revision of the *Portunus pelagicus* (Linnaeus, 1758) species complex (Crustacea: Brachyura: Portunidae), with the recognition of four species" (PDF). *The Raffles Bulletin of Zoology*. 58 (2): 199–237. ISSN 0217-2445 – via The Raffles Bulletin of Zoology.
 101. [^] Jump up to:^a ^h Nicholas Romano & Chaoshu Zeng (2007). "Ontogenetic changes in tolerance to acute ammonia exposure and associated histological alterations of the gill structure through the early juvenile development of the blue swimmer crab, *Portunus pelagicus*". *Aquaculture*. 266: 246–254. doi:10.1016/j.aquaculture.2007.01.035.
 102. [^] Nicholas Romano & Chaoshu Zeng (2007). "Acute toxicity of sodium nitrate, potassium nitrate and potassium chloride and their effects on the hemolymph composition and gill structure of early juvenile blue swimmer crabs (*Portunus pelagicus* Linnaeus, 1758) (Decapoda, Brachyura, Portunidae)". *Environmental Toxicology and Chemistry*. 26 (9): 1955–1962. doi:10.1897/07-144R.1. PMID 17705664.
 103. [^] Nicholas Romano & Chaoshu Zeng (2007). "Effects of potassium on nitrate mediated changes to osmoregulation in marine crabs". *Aquatic Toxicology*. 85 (3): 202–208. doi:10.1016/j.aquatox.2007.09.004. PMID 17942166.
 104. [^] "Blue Swimmer Crab". pir.sa.gov.au. Department of Primary Industries and Regions, South Australia. Retrieved 2016-03-19.
 105. [^] "Bag and size limits - saltwater - NSW Department of Primary Industries". www.dpi.nsw.gov.au. Retrieved 2016-03-19.
 106. [^] "Recreational fishing guide 2015" (PDF).
 107. [^] "Blue swimmer crab recreational fishing". www.fish.wa.gov.au. Retrieved 2016-03-19.
 108. [^] "Size, take and possession limits for tidal waters". www.daf.qld.gov.au. Retrieved 2016-03-19.
 109. [^] <http://www.nt.gov.au/d/Fisheries/Content/File/recreational/know-your-limits-booklet.pdf>
- [^] Nicholas Romano & Chaoshu Zeng (2006). "The effects of salinity on the survival, growth and haemolymph osmolality of early juvenile blue swimmer crab, *Portunus pelagicus*". *Aquaculture*. 260: 151–162. doi:10.1016/j.aquaculture.2006.06.019.