Papua New Guinea mud crab identification cards

NATIONAL FISHERIES AUTHORITY
Papua New Guinea

Pacific Community
Communauté du Pacifique

These identification cards are produced by the Pacific Community (SPC) and the National Fisheries Authority (NFA) of Papua New Guinea (PNG) to help with the identification of the four species of mud crabs encountered in PNG:

- *Scylla serrata* – the giant mud crab;
- *Scylla olivacea* – the orange mud crab;
- *Scylla paramamosain* – the green mud crab; and
- *Scylla tranquebarica* – the purple mud crab.

The cards are designed to be used by those responsible for monitoring PNG's mud crab fisheries or enforcing regulations related to these fisheries when in the field.

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Black-and-white illustrations in this publication are reproduced with the kind authorisation of Dr Clive Keenan, Principal Consultant. Several crab pictures were kindly provided by Dr Hsi-Te Shih and Yu-Hsuan Huang from the National Chung Hsing University of Taiwan, and by Dr Jose Christopher E. Mendoza from the Lee Kong Chian Natural History Museum of Singapore. Cover picture is by Matthieu Juncker.

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The main sources of information for these cards are the following publications:

Fazhan H., Waiho K., Quinitio E., Baylon J.C., Fujaya Y., Rukminasari N., Azri M.F.D., Shahreza M.S., Ma H., Ikhwanuddin M. 2020. Morphological descriptions and morphometric discriminant function analysis reveal an additional four groups of spp. PeerJ 8:e8066 https://doi.org/10.7717/peerj.8066

Government of Western Australia Department of Fisheries. 2013. Fisheries fact sheet: mud crab. Fact Sheet n°28. http://www.fish.wa.gov.au/species/mud-crabs/pages/default.aspx

Keenan C., Davie P. and Mann D. 1998. A revision of the genus *Scylla* De Haan, 1833 (Crustacea: Decapoda: Brachyura: Portunidae). The Raffles Bulletin of Zoology 46(1):217–245.

Ng P.K.L. 1998. Crabs. p.1045–1155. In: Carpenter K.E. and Niem V.H. (eds); FAO species identification guid for fishery purposes. The living marine resources of the Western Central Pacific. Volume 2. Cephalopods, crustaceans, holothurians and sharks. Rome, FAO.

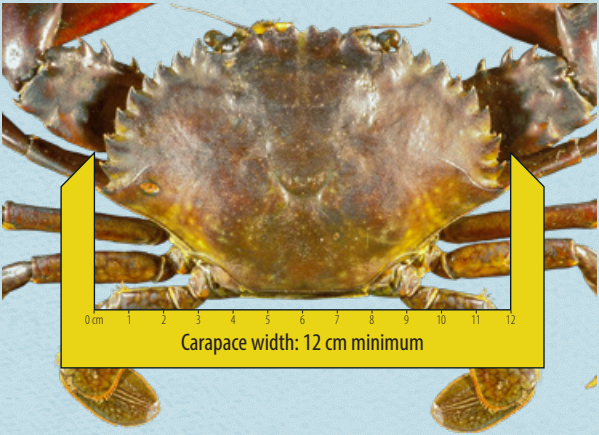
Pacific Community. 2011. Guide & Information sheets for fishing communities - Information sheet 12: Mangrove crab (Scylla serrata). Noumea, New Caledonia: Secretariat of the Pacific Community. 2 p. https://purl.org/spc/digilib/doc/8vtet

Vincecruz-Abeledo C.C. and Ablan Lagman M.C. 2018. A revised dichotomous key for the mangrove crab genus *Scylla* De Haan, 1833 (Brachyura, Portunidae). Crustaceana 91:847–865.

Mud crab fishing

In 2022, the Government of Papua New Guina put in place an updated version of the *National Mud Crab Fishery Management Plan 2019*.
It includes the following prohibitions:

- **The harvesting, buying, exporting and trade of mud crabs less than 12 cm carapace width for all species of mud crab is prohibited.**

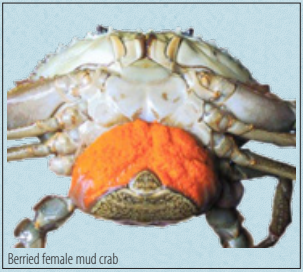


- **The harvesting of mud crabs in moult stage is prohibited.**

A crab moults when it sheds a part of its body (often the outer layer or shell), either at specific times of the year or at specific stages in its life cycle.

prohibitions in PNG

- **The harvesting of berried female mud crabs is prohibited. Captured berried female mud crabs must be immediately returned to the body of water or the mud from which they were taken from, with as little injury to the mud crab as possible.**



Berried female mud crab

- **Harvesting methods are restricted to include crab pots, baited traps, scoop nets, mangrove hook and mangrove stake used to catch mud crabs.**

Traditional and modern crab pots

Scoop net

Hook and stake

Traditional baited trap

Images: ©NFA

- **The harvesting of mud crabs at night is prohibited.**

Some features used

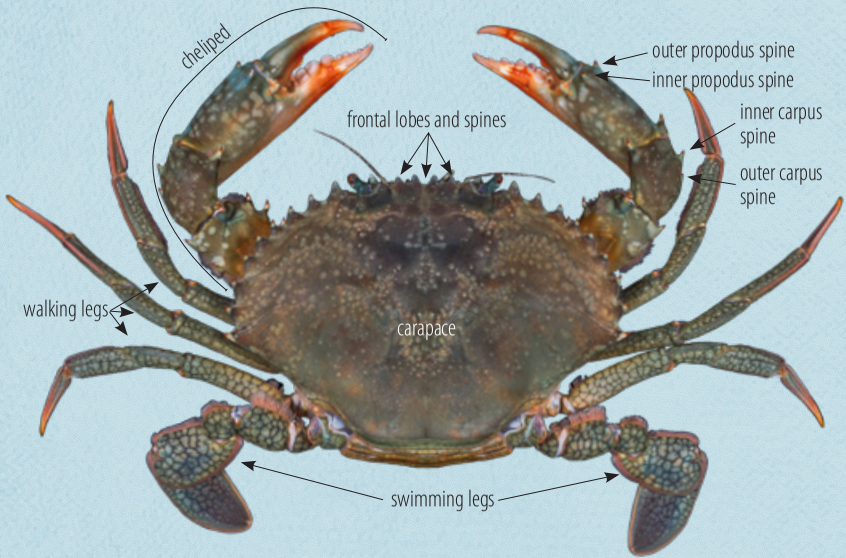
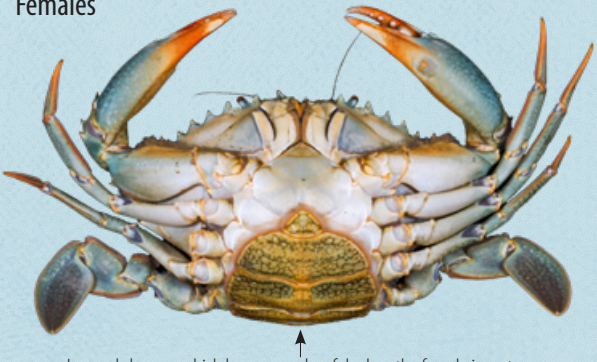


Image: ©Yu-Hsuan Huang

to identify mud crabs

Females



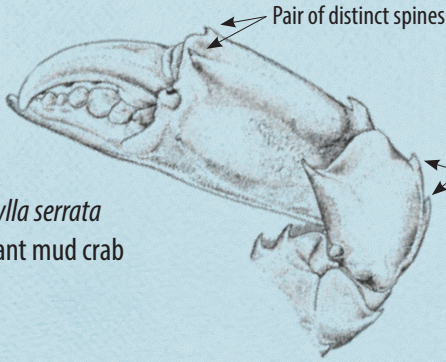
Large abdomen, which becomes colourful when the female is mature

Males

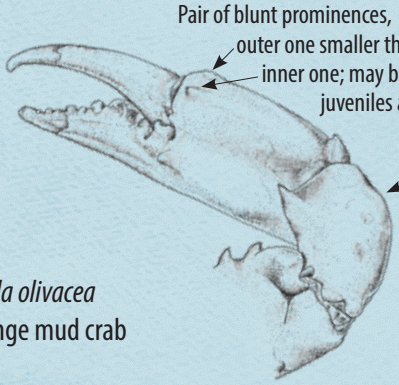
Narrow v-shaped abdomen

Images: ©Yu-Hsuan Huang

Some features used to



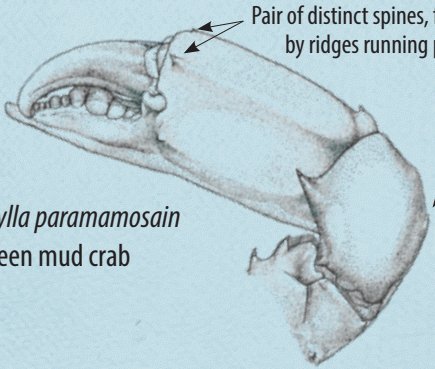
Scylla serrata
Giant mud crab



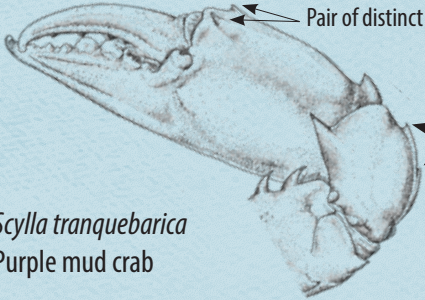
Scylla olivacea
Orange mud crab

Images from Keenan et al. 1998

identify mud crabs



Scylla paramamosain
Green mud crab



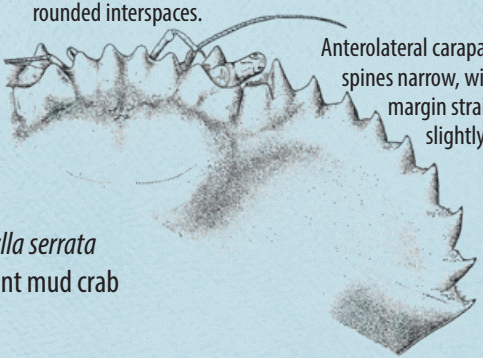
Scylla tranquebarica
Purple mud crab

Images from Keenan et al. 1998

Some features used to

Frontal lobe spines high, bluntly pointed with tendency to concave margins and rounded interspaces.

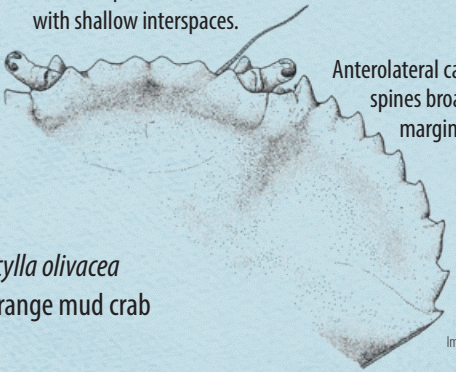
Anterolateral carapace spines narrow, with outer margin straight or slightly concave.



Scylla serrata
Giant mud crab

Frontal lobe spines low, rounded with shallow interspaces.

Anterolateral carapace spines broad, with outer margin convex.



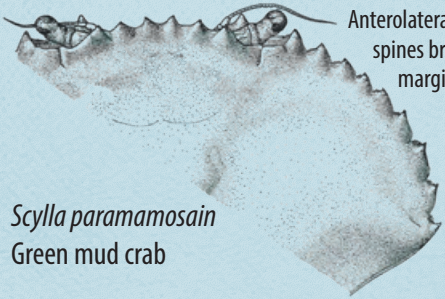
Scylla olivacea
Orange mud crab

Images from Keenan et al. 1998

identify mud crabs

Frontal lobe spines high, typically triangular with straight margins and angular interspaces.

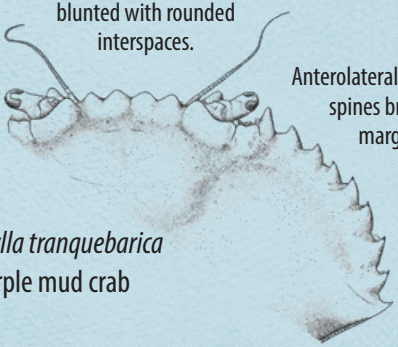
Anterolateral carapace spines broad, with outer margin convex.



Scylla paramamosain
Green mud crab

Frontal lobe spines of moderate height, blunted with rounded interspaces.

Anterolateral carapace spines broad, with outer margin convex.



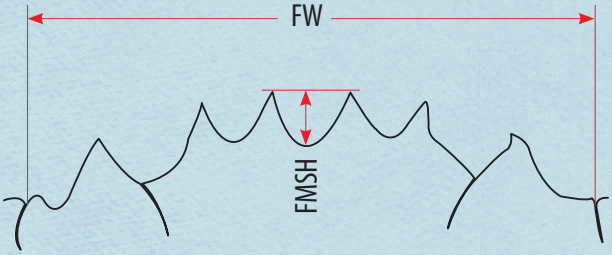
Scylla tranquebarica
Purple mud crab

Images from Keenan et al. 1998

Some features used to

Means and standard deviations of three of the most useful morphological ratios to differentiate the four species of mud crab.

Species	FMSH/FW	ICS/OCS	FW/ICW
Scylla serrata	0.061 ± 0.010	0.940 ± 0.233	0.371 ± 0.016
S. olivacea	0.029 ± 0.005	0.980 ± 0.25 I	0.415 ± 0.017
S. paramamosain	0.058 ± 0.012	0.352 ± 0.235	0.377 ± 0.007
S. tranquebarica	0.043 ± 0.006	0.006 ± 0.035	0.412 ± 0.016

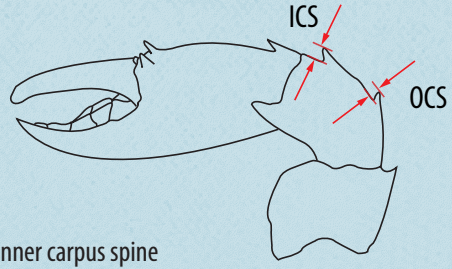


FW: Frontal width

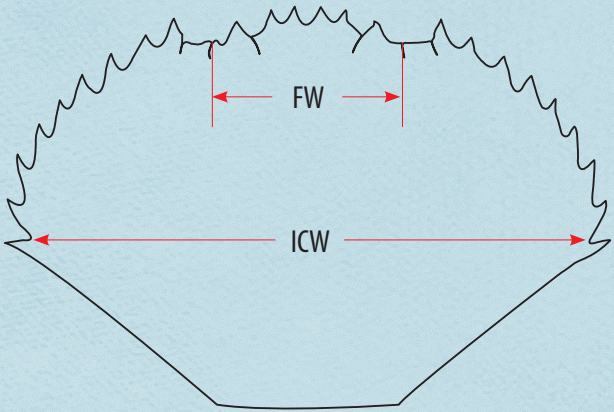
FMSH: Frontal median spines height

Table and image from Keenan et al. 1998

identify mud crabs



ICS: Inner carpus spine
OCS: Outer carpus spine



FW: Frontal width
ICW: Internal carapace width

Images from Keenan et al. 1998

Giant mud crab

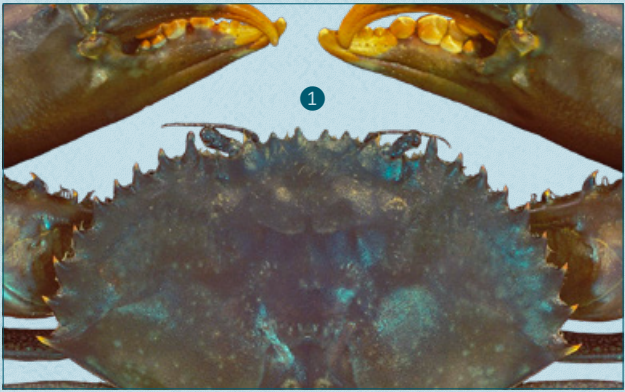
Description: Carapace green to almost black.
Chelipeds blue, puple or green.
Blunt pointed front lobal spines (1); propodous spines obvious (2); both carpus spines obvious (3).
Polygonal patterns on all legs (4).
Largest of the four species of mud crabs.
Can grow up to 30 cm in carapace width and 2.5 kg.

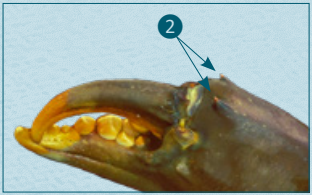
Habitat: Associated with mangrove forests inundated with full salinity oceanic water for the greater part of the year. Can tolerate reduced salinity.

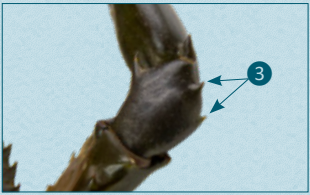
Image: ©Hsi-Te Shih

MUD

Scylla serrata







Orange mud crab

Description: Carapace brownish to browinsh green or orangish.

Chelipeds orange or red through brown to black.

Low rounded front lobal spines (1); propodous spines reduced (2); inner carpus spine absent, outer spine reduced (3).

Polygonal patterns absent on all chelipeds and legs (4).

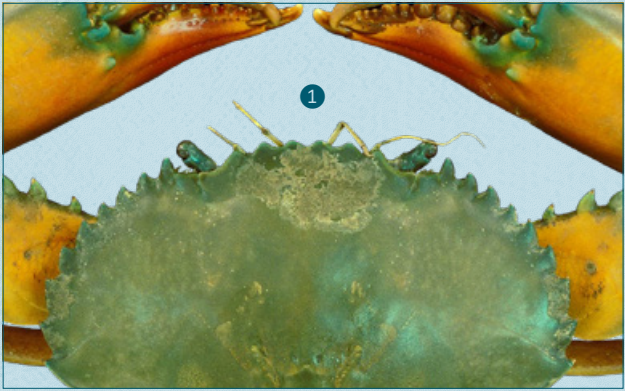
Can grow up to 18 cm in carapace width and 2.5 kg.

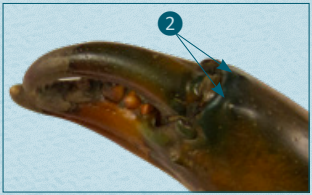
Habitat: Associated with mangrove forests and coastlines inundated with reduced salinity seawater.

Image: ©Hsi-Te Shih

YLW

Scylla olivacea





Images: ©Hsi-Fe Shih (1) and NFA (2, 3, 4)

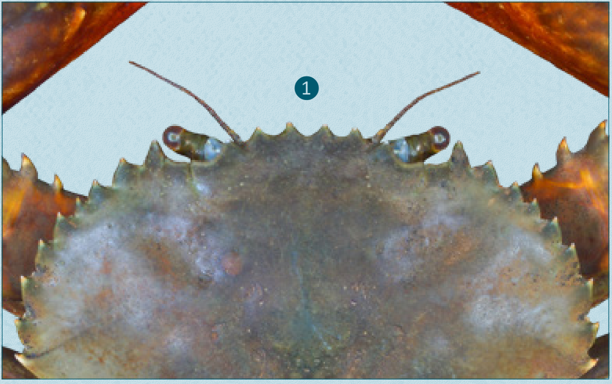
Green mud crab

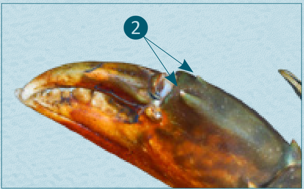
Description: Carapace green to light green.
Chelipeds green to bright yellow with black spot or stripe patterns, different from *S. serrata* polygonal patterns .
Triangular front lobal spines (1); propodous spines obvious (2); inner carpus spine as a blunt prominence (spinous in juveniles), outer carpus spine absent (3).
Polygonal patterns on the swimming legs only (4).
Can grow up to 20 cm in shell width and 2 kg.

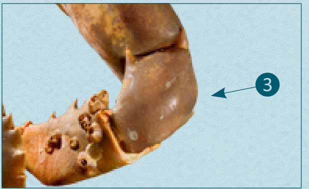
Habitat: Can be ssociated with shallow denuded coral (reef rubble), shallow subtidal flats and estuarine ponds, and mangrove forests.

Image: ©Yu-Hsuan Huang

Scylla paramamosain







Images: ©Yu-Hsuan Huang (1,2,4) and Jose Christopher E. Mendoza (3)

Purple mud crab

Description: Carapace green to almost black.

Chelipeds mostly purple, rarely green or blue.

Blunt front lobal spines (1); propodous spines obvious (2); both carpus spines obvious (3).

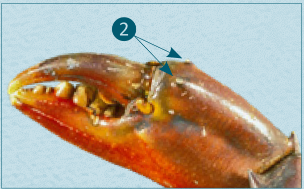
Polygonal patterns on the second and third walking legs, and on the swimming legs (4).

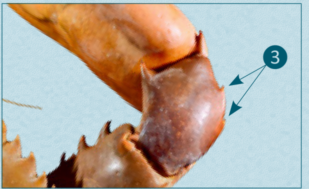
Can grow up to 20 cm in shell width and 2 kg.

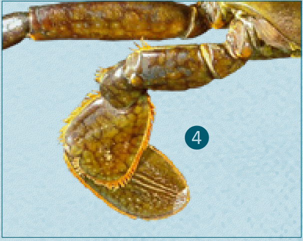
Habitat: Associated with mangrove forests and coastlines inundated with reduced salinity seawater for part of the year. Reported to be found berried within estuaries.

Image: ©Hsi-Te Shih

Scylla tranquebarica







Images: ©Hsi-Te Shih (1,2,4) and Jose Christopher E. Mendoza (3)

Giant mud crab

Habitats and feeding

The giant mud crab is found in muddy areas associated with mangroves and seagrass beds in the tidal mouths of rivers and sheltered bays.

The crabs burrow in the mud and generally have a restricted home range (area over which they move to feed).

Giant mud crabs eat small clams, worms, shrimps, barnacles, small fish, plant material and other crabs. They also eat smaller, injured or weak mangrove crabs. Juvenile mangrove crabs are eaten by wading birds and a wide range of fish. Adult crabs have been found in the stomachs of sharks and larger fish.

Reproduction and life cycle

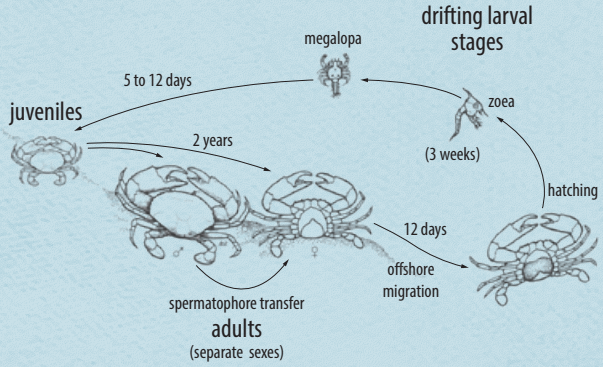
Giant mud crabs reach reproductive maturity in about 2 years and live for about 3 to 4 years by which time they can weigh up to 2.5 kg with a shell width of up to 30 cm.

During mating, the male (♂) crab transfers sperm packets (spermatophores) to the underside of a soft-shelled female (♀) where the sperm is stored for many months. The female releases over a million eggs which are fertilised by the stored sperm. The female (now said to be "berried") carries the eggs for about 12 days. During this period the colour of the eggs changes from bright orange to almost black as the young crabs grow inside.

biology

The female moves offshore where the eggs are released and hatch to become small floating forms (the drifting larval stages) about 1 mm long. These float in the sea for about 3 weeks and drift with currents back to inshore areas.

The final larval stage (megalopa) settles on the sea floor and turns into a miniature adult or juvenile (about 4 mm wide) within 5 to 12 days. Less than one in every thousand of the small floating forms survives to become a juvenile. And less than one in every hundred juveniles survives to become an adult.



Giant mud crab life cycle

Pacific Community
Communauté du Pacifique

NATIONAL FISHERIES AUTHORITY
Papua New Guinea

EUROPEAN UNION

Sweden
Sverige

PEUMP
Pacific-European Union Marine Partnership Programme

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