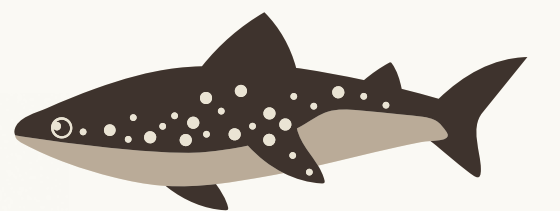
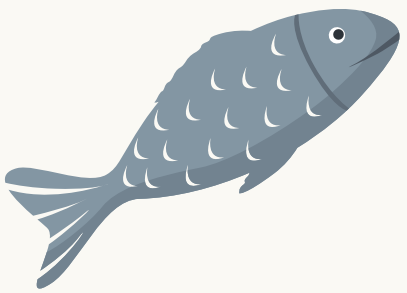

THE SEARCH FOR SEAWEED

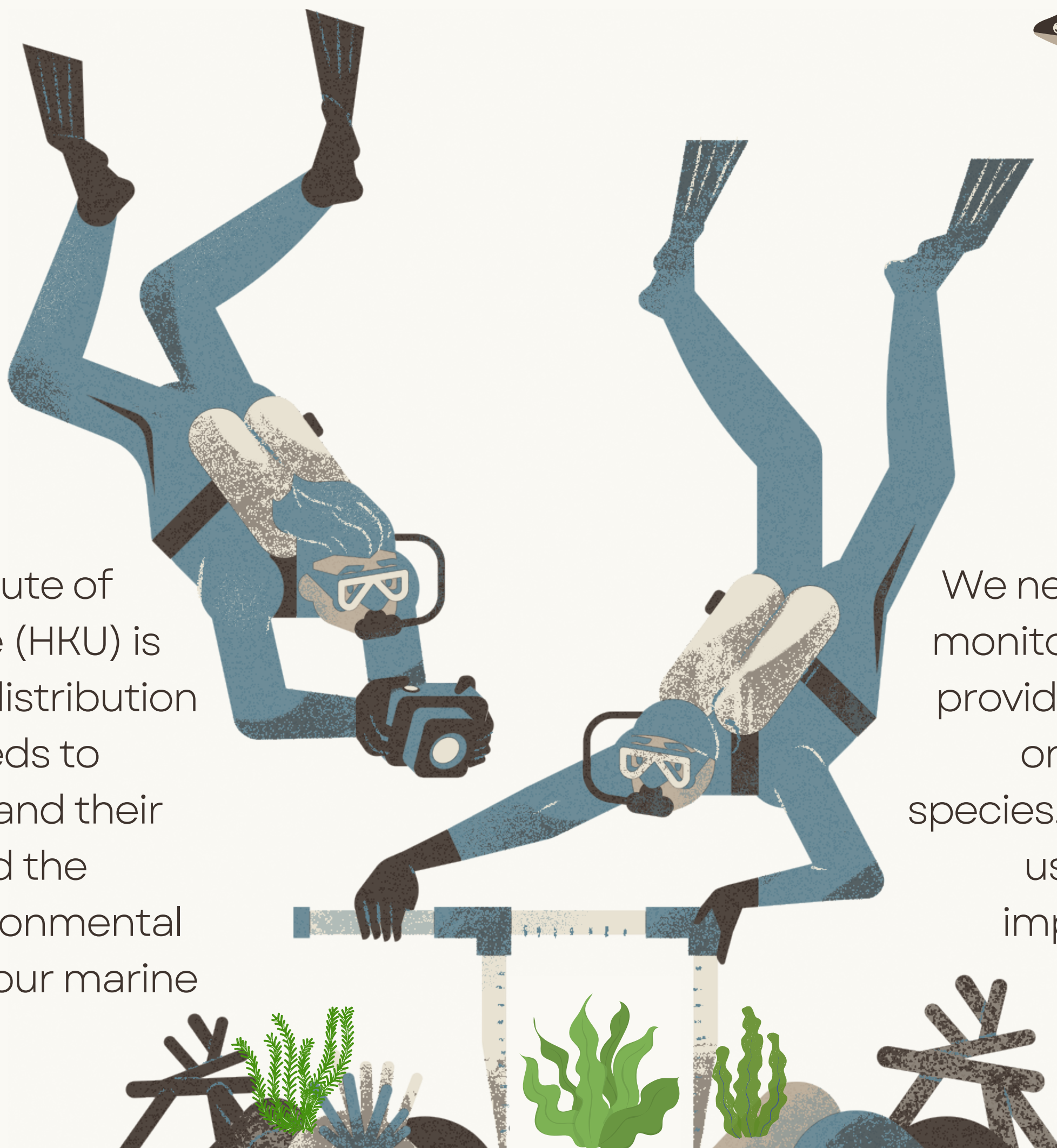


The Mission

The Swire Institute of Marine Science (HKU) is looking at the distribution of local seaweeds to better understand their abundance and the effects of environmental change within our marine environment.

Join the Survey

We need your help to monitor seaweeds. By providing information on local seaweed species, you could help us to protect this important habitat.



<https://freeonlinesurveys.com/s/HD eGzzPV>



@searchforseaweed



www.marinefutures.org



searchforseaweed@gmail.com

THE SEARCH FOR SEAWEED

Why Seaweeds?

Seaweeds provide many ecosystem benefits. They create an underwater habitat that provides shelter and food for marine species. They can absorb nutrients from the water and carbon from our atmosphere, and can even protect our coasts from storm damage. They also support fisheries and have many commercial applications.

Changing Seas

The Search for Seaweed project is mapping Hong Kong's seaweed species. We would like to identify where seaweeds are located and determine their health and abundance. It is important for us to identify this, so that we can monitor the seaweed populations and manage them for the future.

Join the survey

When? All year round, but you are most likely to encounter seaweed populations during January - May.

Where? Any shore, intertidal or subtidal area in Hong Kong. All sightings and absences of seaweeds are important for this research. Please help us by recording both an absence and presence of seaweeds. When recording the presence of seaweed, the seaweed needs to be alive and anchored to a hard substrate (i.e., rocks, piers, seawalls, gravel etc).

Who can take part? Everyone can take part. You can collect data from the coast (i.e., with a drone) or at sea (i.e., whilst diving/boating)

Tools

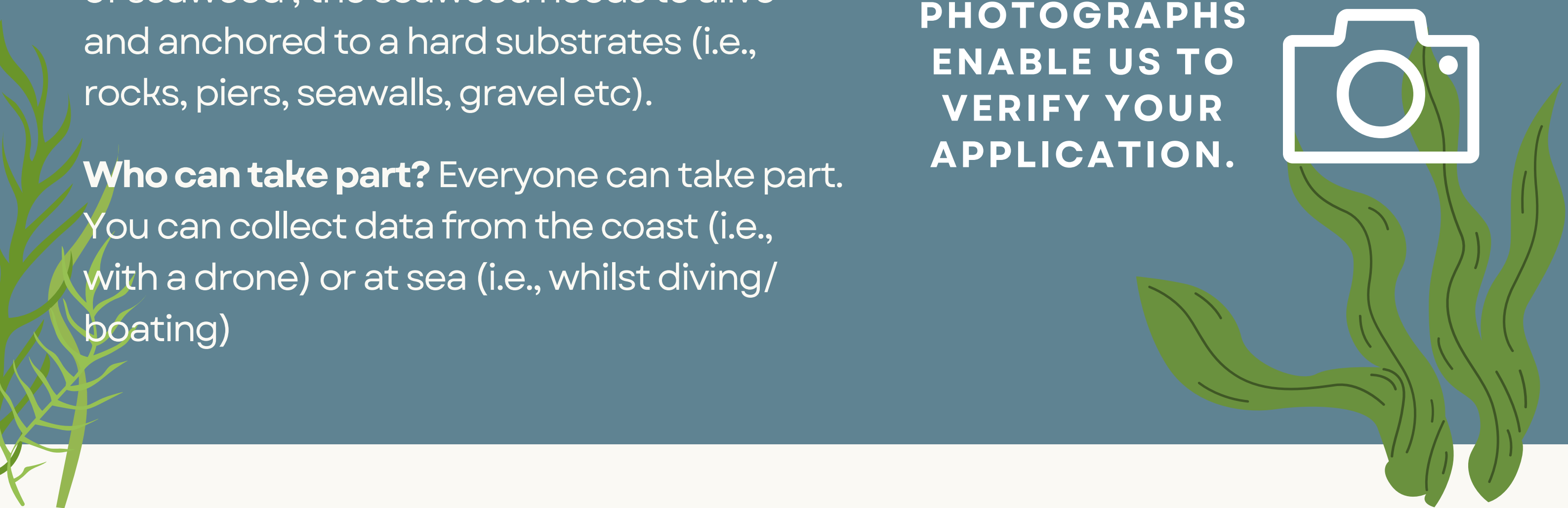
You will need:

- This guide
- A device or phone to record your survey

Optional:

- Dive slate and marker
- An underwater camera
- Water temperature gauge

**PHOTOGRAPHS
ENABLE US TO
VERIFY YOUR
APPLICATION.**



1. RECORD THE AREA OF YOUR SEARCH AND THE WATER TEMPERATURE.

Tell us where you visited and how you conducted your survey (i.e., SCUBA diving, snorkelling, from a vessel, using a drone or from a coastal walk). Please provide as much information about the area as possible as possible.

2. TAKE PHOTOS (OPTIONAL)



At your seaweed patch, take at least two photographs of each seaweed species you encounter.

Picture 1: Take a photo from a distance, so that the seabed and the top of the seaweed are in view. If the seaweed patch is large, please take a picture to capture the total area.

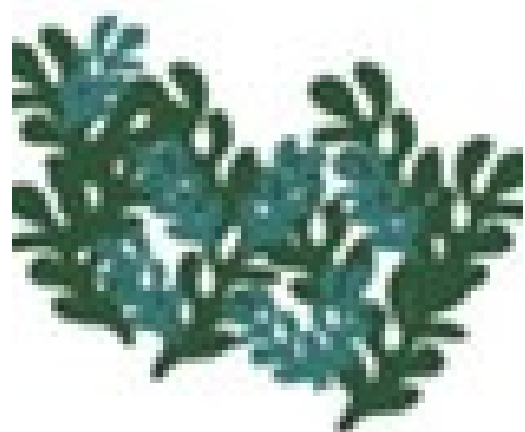
Picture 2: Take at least one close up picture, including the blades of the seaweed so that we can try to identify the species. Please take a photograph of each seaweed species, if there is more than one type.

WHY ARE PHOTOS SO IMPORTANT?

Photographs enable us to verify the species identified and help us to assess the size of the seaweed patch encountered. They can also be archived and used in future monitoring studies. Your photos could also support the development of a deep learning model, which would enable seaweeds to be assessed using artificial intelligence. This would help scientists identify seaweed taxa more efficiently, saving time and resources during research and conservation projects.

3. RECORD KEY SEAWEED SPECIES

- ☐ Refer to the survey questionnaire and record the presence or absence of key seaweeds species.
- ☐ If present, record the abundance of key seaweeds as band-forming, patchy or sparse (optional).



Band-forming / Dense
A dense patch or uninterrupted band of seaweed across the seaweed patch (over 5 metres)



Patchy
Large patches of seaweed (over one metre).



Sparse
Small patches of seaweed (less than one metre across).

4. RECORD & COUNT THE URCHINS

Explore your plot for a minute and try to estimate the number of sea urchins within an average 1 m² radius (roughly the length of your outstretched arm, from the tip of your finger to the middle of your chest). Please try to take a photo so that we can verify the species and abundance.

5. SEND US YOUR RESULTS

Upload your answers using the following link:
<https://freeonlinesurveys.com/s/HDeGzzPV>

If you have photos, please send them to searchforseaweed@gmail.com. If your files are large, you can send the photos via Wetransfer or Google Drive for free.



RECORDING FORM

SECTION 1: ABOUT YOU

1. Your name _____

2. Email address _____

3. Name of group/company/club (if applicable) _____

4. How many people surveyed the plot? _____

5. Date _____

6. Start time _____ End time _____

7. How was this information collected (boat / from the shore / other)?

8. Area surveyed (please provide details):

9. Did you record seaweed during your trip? Yes (go to Q10) / No (go to Q14)

10. Did you record the following seaweeds (Y/N):
Sargassum sp. ☐ Encrusting Algae ☐
Ulva sp. ☐ Branching Red Algae ☐ Other species ☐

11. How would you describe the abundance of the seaweed patch?
☐ Dense/ Band-forming ☐ Sparse ☐ Patchy

12. Water temperature and depth at the shallowest point

13. Water temperature and depth at the deepest point

14. How many sea urchins did you record in an average 1m² during your survey?
a) 0 c) 4 - 8 e) 16 - 25
b) 1 - 3 d) 9 - 15 f) > 25

14. Seabed Habitat:
a. mostly rock
b. a mixture of rock and soft sediment (i.e., sand/ mud)
c. almost all sand or mud with limited rock
d. man-made structures or sea defences

RECORDING FORM (OPTIONAL)

SECTION 2: SEAWEED RECORDING:

	PRESENT	BAND-FORMING	PATCHY	SPARSE
Phaeophyceae (Brown)				
• <i>Dictyota species</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>Ishige okamurae</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>Petalonia binghamiae</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>Sargassum species</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>Sargassum horneri</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>Sargassum patens</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>Scytosiphon lomentaria</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rhodophyta (Red)				
1. <i>Gelidium crinale</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. <i>Gelidium pusillum</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. <i>Gloiopeltis complanata</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. <i>Gloiopeltis furcata</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. <i>Padina arborescens</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. <i>Porphyra species</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. <i>Pterocladia tenuis</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chlorophyta (Green)				
1. <i>Colpomenia sinuosa</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. <i>Dictyosphaeria cavernosa</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. <i>Ulva species</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. <i>Valoniopsis pachynema (turf algae)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coralline algae				
1. Corallina species (branching)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Encrusting coralline algae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other genera / species? _____

RECORDING FORM

SECTION 3

DATA PROTECTION

☐

I consent to the University of Hong Kong contacting me about The Search for Seaweed research project.

☐

Yes I would like to receive information about other community science projects and marine activities.

Why do we ask for your name and email address?

You will only be contacted if a colleague wishes to find out more about your observation. If you agree by ticking the box below, we will also email you to let you know about other citizen science projects and marine activities that are taking place.

Data Protection Statement

Your information will be stored and processed in accordance with data protection regulations and will only be used by the University of Hong Kong for research purposes.

Thank you for taking part and your interest in this work. Please upload your answers using the following link:

<https://freeonlinesurveys.com/s/HDeGzzPV>

Please send your photos to searchforseaweed@gmail.com. If your files are large, you can send the photos via Google Drive or [Wetransfer](#) for free.

CHECKLIST

- ☐ Record the location and details of the area surveyed.
- ☐ Record the water temperature and depth at the shallowest and deepest points.
- ☐ Optional - if you have found seaweed, take photos of your patch to record:
 - a. abundance
 - b. biomass / height of seaweed
 - c. species identification and features
- ☐ For the key seaweed species identified, record the abundance as:



Band-forming / Dense
An uninterrupted band of seaweed right across the width of your population.



Patchy
Large patches of seaweed (over one metre).



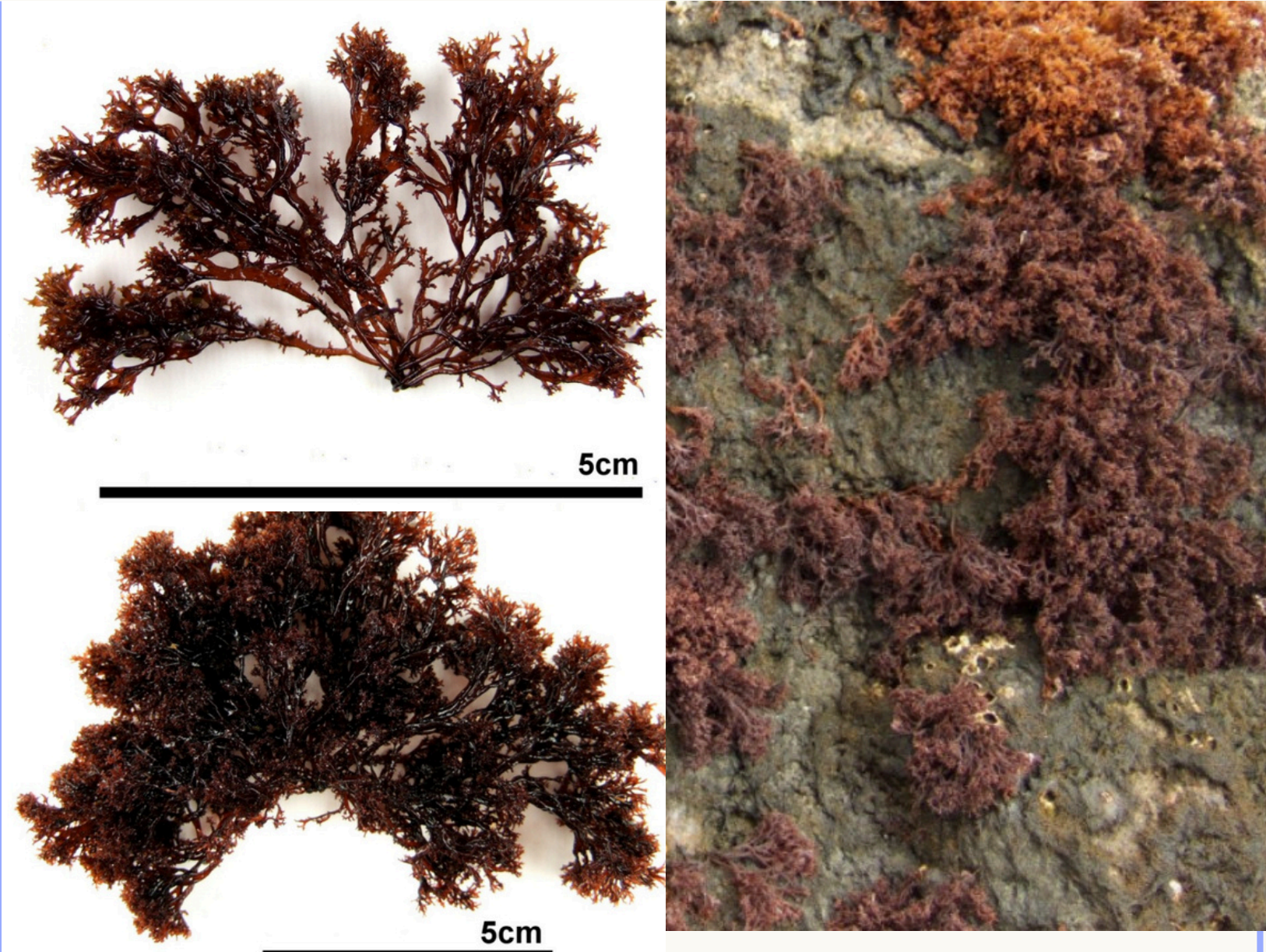
Sparse
Small patches of seaweed (less than one metre across).

- ☐ If you have located sea urchins, take a photograph (optional), and count or estimate the number of sightings within an average 1 m².
- ☐ Complete the form online (<https://freeonlinesurveys.com/s/HDeGzzPV>), making sure to record all of the details accurately.
- ☐ Send your photos to searchforseaweed@gmail.com (optional)

IDENTIFICATION GUIDE

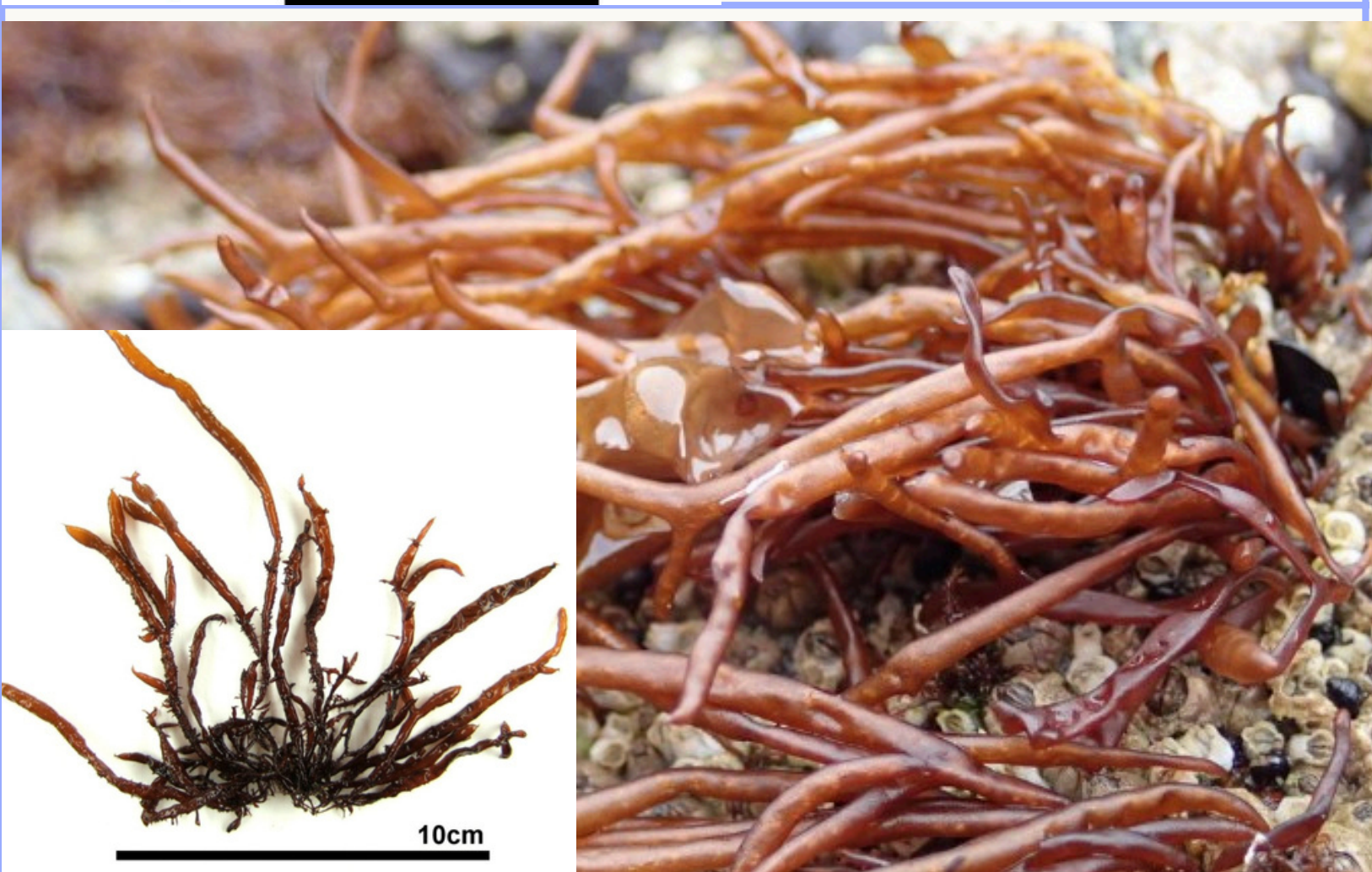
Gloiopeltis complanata

Body is small and cylindrical or slightly compressed and hollow. It has small disc-shaped appressoria and grows in clusters. Thallus cartilaginous, slippery, bushy, erect (up to 4 cm high) or semi-prostrate, arising from creeping axes forming dense turf. Dark reddish-purple, pinkish near apices. Branching irregular. Branchlets spinous with acute apices.



Gloiopeltis furcata

Body is cylindrical and hollow. Irregularly forked. Thallus cartilaginous, slippery, bushy, forming dense mats. Grows up to 15 cm high. Brownish-purple. Filamentous in the lower portion and widening towards the apex and becoming hollow.



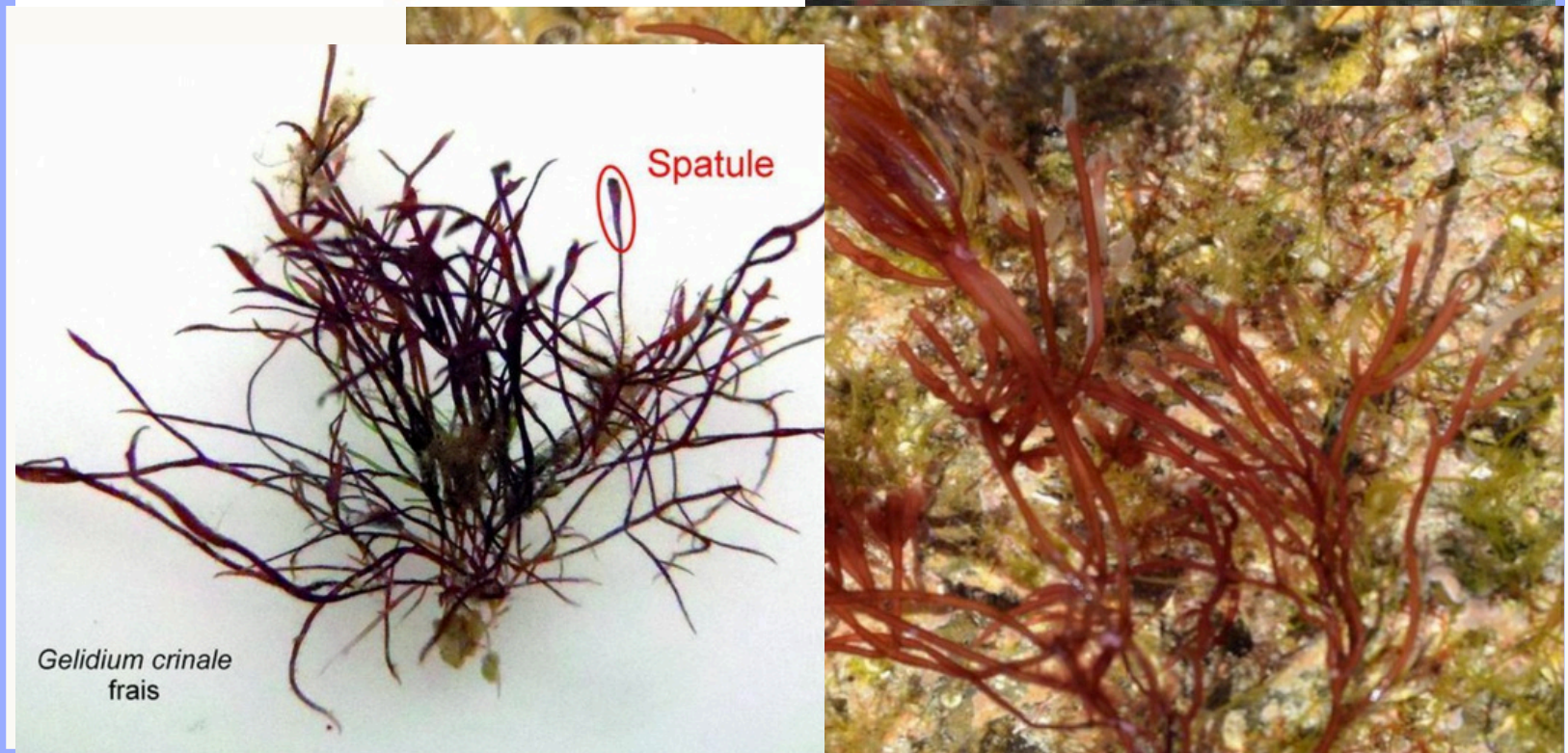
Gelidium pusillum

Cartilaginous, purplish or blackish red, turf-forming, 2-10 mm high, arising from an extensive creeping base and incorporating shell debris and small molluscs. Firmly attached by dense tufts of unicellular rhizoids



Gelidium crinale

Thallus bushy, cartilaginous, dark redbrown, forming dense turfs or masses, 2–4(–6) cm high, composed of prostrate axes, bearing erect branches. Prostrate axes terete, 100–200 µm diam.



IDENTIFICATION GUIDE

Padina arborescens

Thalli erect, leather-like and fan-shaped, but kidney-shaped when young. Thickness of blades up to 0.3-0.4 millimetre, margin rolls inward and becomes thicker. Thalli may split into a few lobes, 10-20 centimetres tall. Brown to dark brown in colour. Grows on hard bottom around 2-5 metres deep water.



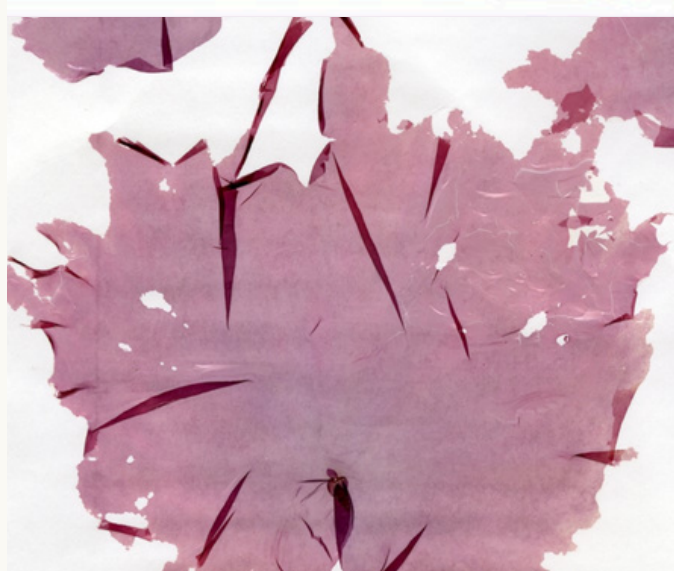
Porphyra acanthophora

Commonly known as “Tze Choi” in Chinese. Thalli membrane-like, soft and slippery, attached to the substratum with a small holdfast. Blade shape varies greatly and grows to 2-10 centimetres in size. Blades brown to purplish red in colour.



Porphyra suborbiculata

Purple-red to dark brownish-red. Thallus membranous, orbicular, 2-3-(6) cm high, to 10 cm broad, sessile, commonly aggregate, often overlapping each other, with smooth or slightly undulate margins. Blades are thin.



Pterocladia tenuis

Body is flat, with regular feather-like branches. The base of the branch is thin and the tip of the branch is rounded. Several individuals grow in clusters, entangled with attached roots. Thallus is erect, cartilaginous, and bushy. Hard and rough to touch. Grows 5–20 cm high, consisting of creeping and erect axes. Body is red to dark red.



IDENTIFICATION GUIDE

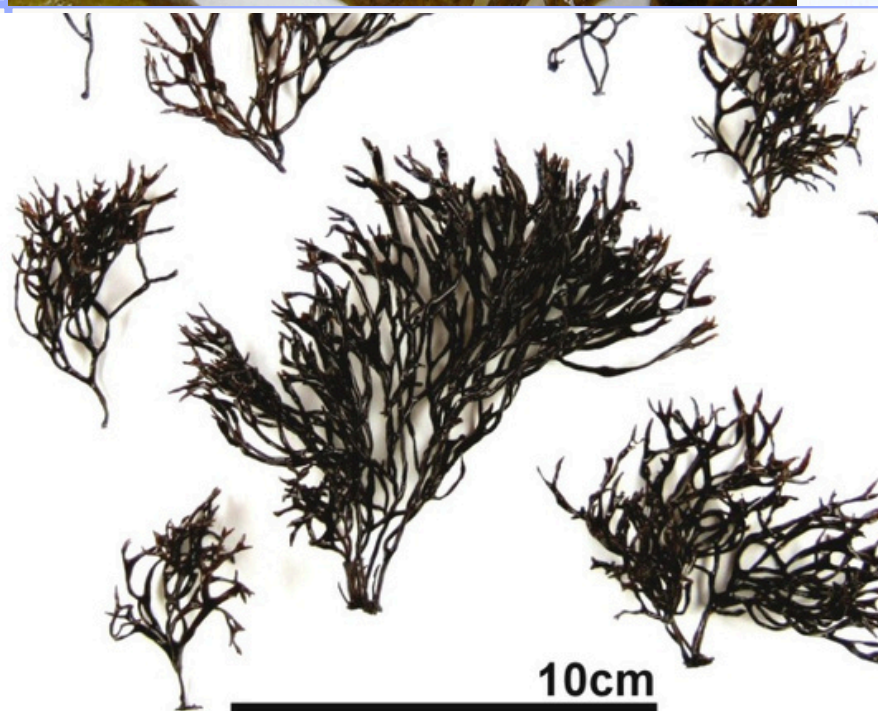
Dictyota species

The body is soft, flat and string-like, branching several times in the shape of a fork, and spreading out in a fan shape. The tip is rounded and slightly concave. When mature, dark spots appear on the surface and the thalli becomes darker and rougher. When it dies, it turns yellow-green. Thalli erect and coarse. Height around 7 - 15 cm.



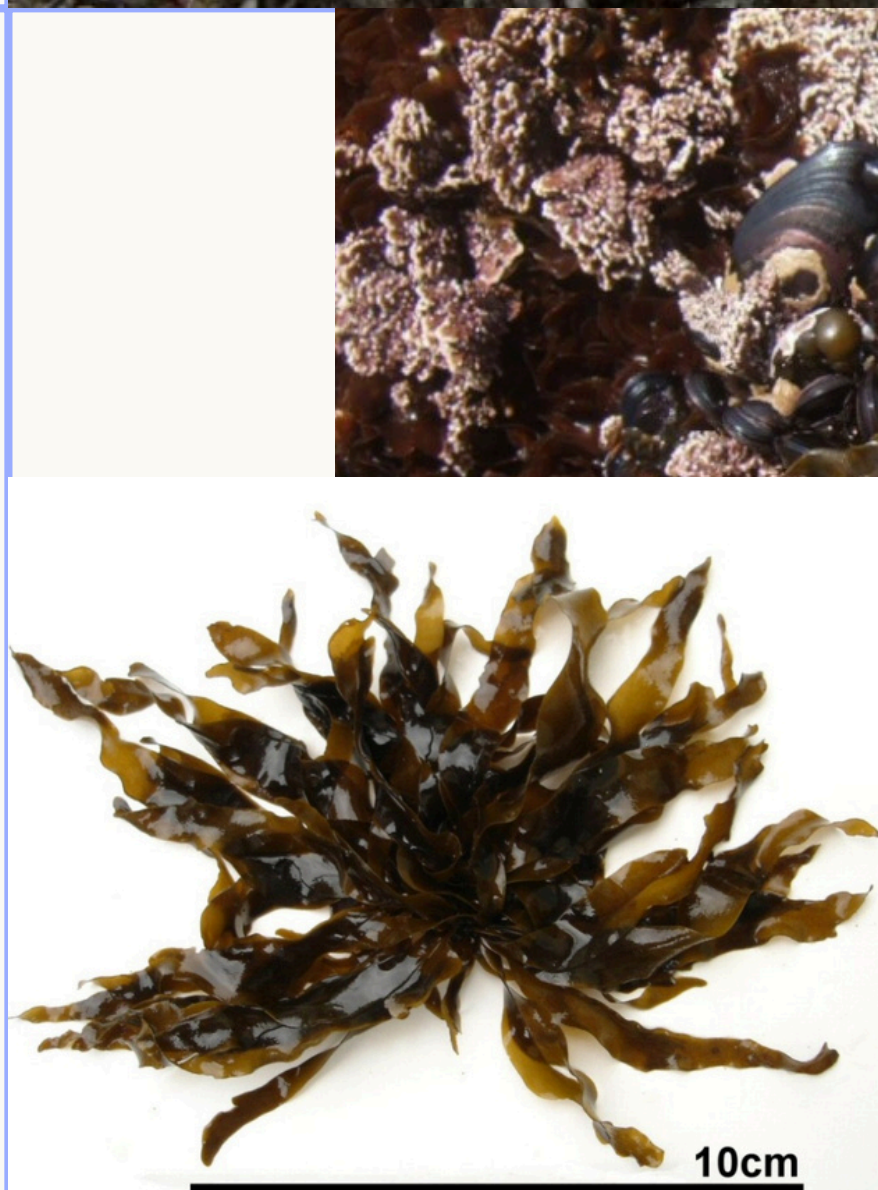
Ishige okamurae

Body is cylindrical but the thallus bushy, wiry, cartilaginous, and erect. Grows to 5–15 cm high, stalked (1–2 cm high) Branching irregular, in all directions. Dark olive-brown to black when exposed to the air during low tide. It can be seen on rocks in the intertidal zone.



Petalonia binghamiae

Thalli leafy and soft. Blade linear in shape, tapers towards the bottom. Thalli attached by a short stem and a disc-like holdfast. Grows mainly in shallow subtidal zone in rocky shore, usually at 1-2 metres deep water, often seen swept back and forth by wave. Greenish brown to dark brown in colour. Height 5 - 20 cm and width 1.4 - 4 cm.



IDENTIFICATION GUIDE

Sargassum hemiphyllum

Brown, with differentiated thallus. Blades are broad and serrated, air bladders globulus, and holdfasts perennial. The stem is cylindrical or slightly angular and around 1.5 - 2mm in diameter. During summer, only small blades without edges would grow directly from the holdfast. Height: 30 - 50 cm, sometimes reaching 1 m.



Sargassum horneri

Yellowish-brown, with densely branched, bushy thallus. Leaves and branches emerge from the stem in each direction. The stems often have short spines. Stalk twisted, ribbed, cylindrical. Grows on rocks in lower intertidal to subtidal. Receptacles stout, simple, cylindrical gradually attenuating to acute apices: male receptacles more slender than female one. Grows up to 1 - 5 m.



Sargassum patens

Brown, with differentiated thallus. Blades are broad and serrated, air bladders globulus, and holdfasts perennial. Leaves are elongated and linear. Stems are cylindrical. Where the branches fall off, they remain in the form of knobs. During summer, only small blades without edges would grow directly from the holdfast. Grows 50 - 100 cm.



IDENTIFICATION GUIDE

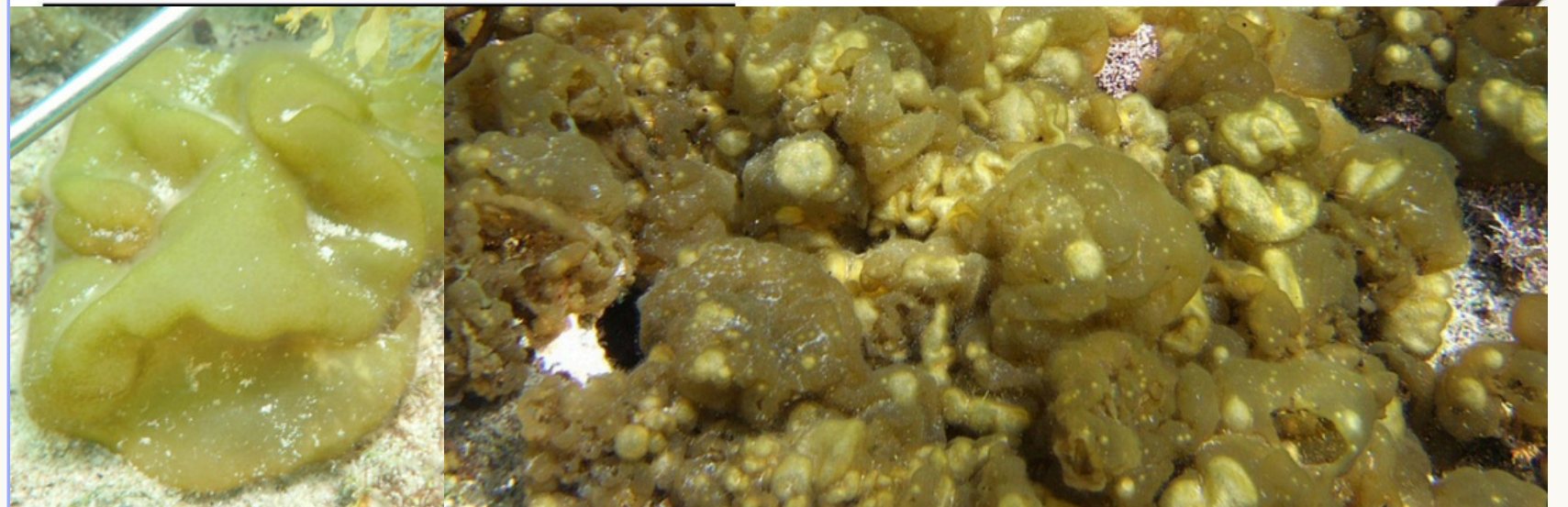
Scytosiphon lomentaria

Thalli is erect, branches tubular and hollow, appear in segments with constriction at junction between segments. A disc-like holdfast gives rise to a bundle of long and cylindrical branches. Grows in clusters up to 50 cm long, but generally around 5 cm long locally. Yellowish brown in colour. Grows on rocks, 1m - 3 m deep water. May appear ruptured as this species is quite often consumed by herbivores.



Colpomenia sinuosa

The body is membranous and hollow, pouch-like with a wavy surface and an amorphous spherical shape. Hard to touch but brittle and easily tears. May grow up to 20 cm in diameter. Light brown to golden brown in colour. Grows solitarily or in clusters on hard substratum including coral surface. Fine, colorless hairs in tufts



Dictyosphaeria cavernosa

Bright green, unbranched, and irregularly inflated, with visible honeycomb texture. Plants forming hollow cushions or mats. Grows 1 - 4 cm. Younger plants spherical. Mature plants convoluted, frequently ruptured, and lobed. There is no branching. Attached to substrate by rhizoids extending from basal segments.



IDENTIFICATION GUIDE

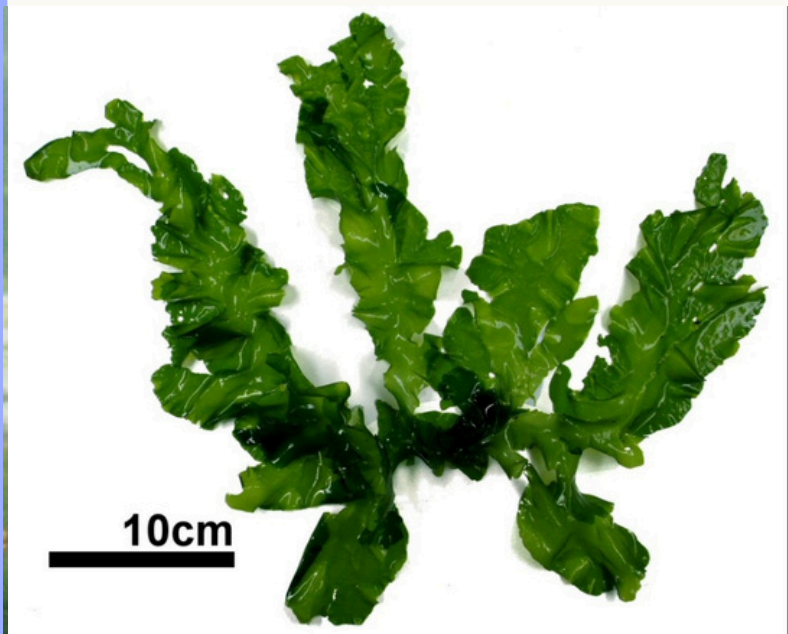
Ulva conglobata

Green and small with rounded, wavy, edges. Body is very short and membranous, with many leaflets. Usually found on near high wave action zone. Bright green to green. Grows 2 - 4 cm.



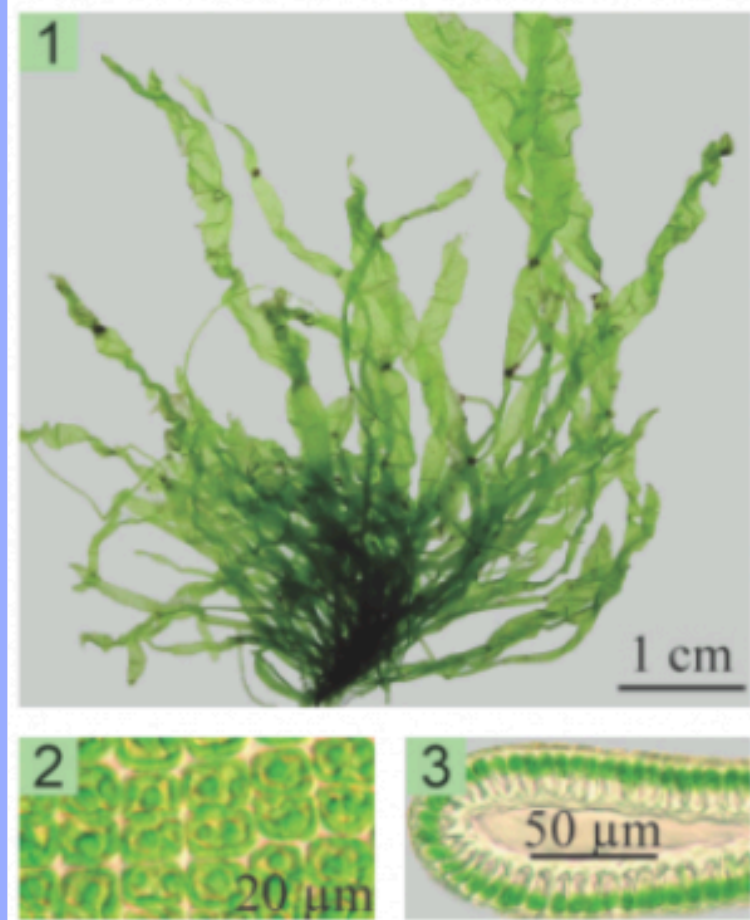
Ulva fasciata

Bright green to dark green, gold at margins when reproductive. May be colourless when stressed. Long, thin blades. Membranous body. Single attachment to rocks in high wave action zone. Basally broadened, but upper portions divided deeply into ribbon-like segments. Holdfast is small without dark rhizoids. Grows 20 - 100 cm.



Ulva compressa

Compressed, elongated, hollow fronds with a green colour. The thallus is tubular, more or less cylindrical; sometimes it is partially flattened, single layered and then forming several strands. The thallus is simple, usually with no branching, and where this occurs it is minimal.



Ulva lactuca

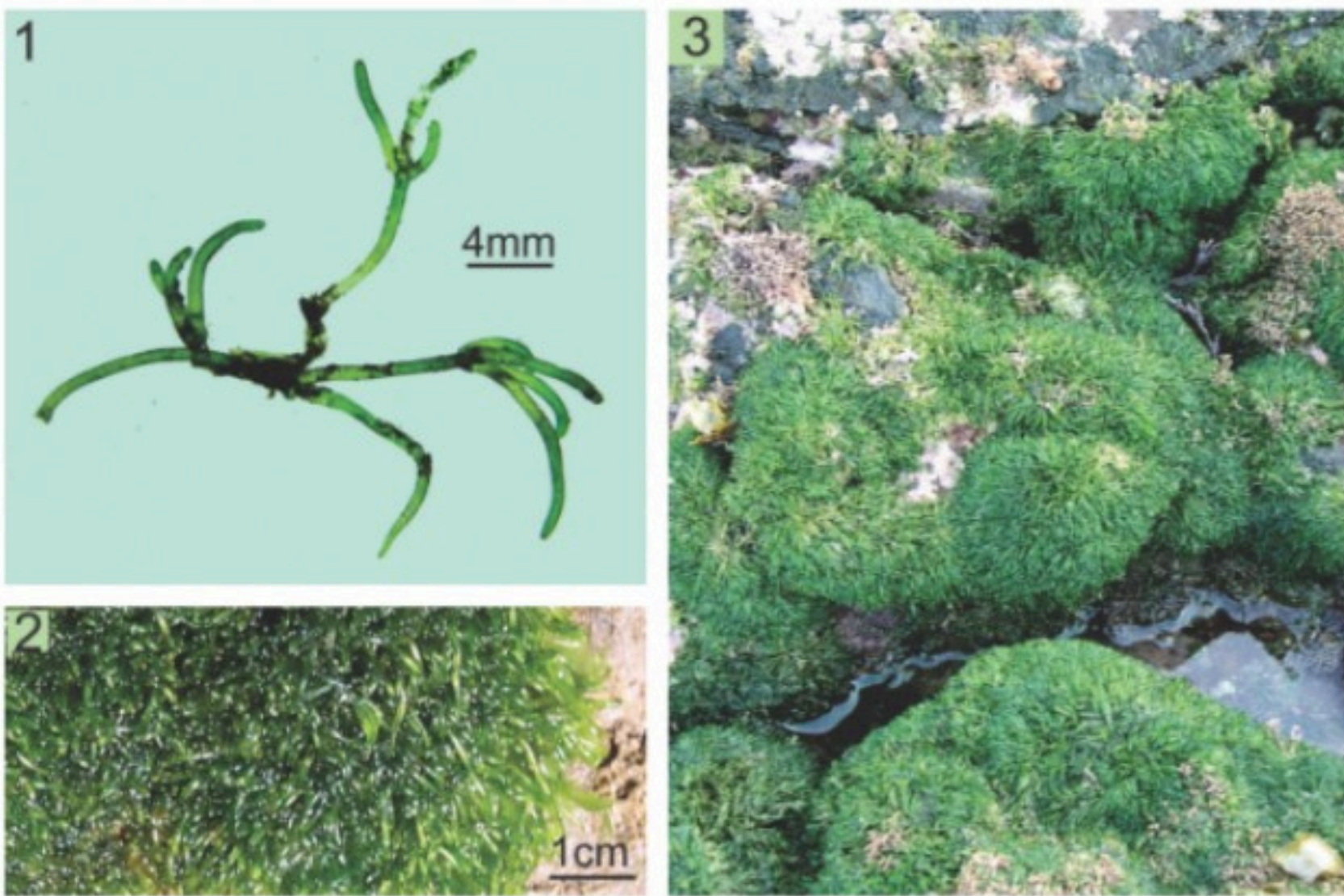
Bright to light green in colour. Thalli soft and variable in shape, ranging from blade-like, long and narrow with wavy margins, to irregularly lobed with folded margins, up to 1 metre in size but usually observed to be around 30 cm locally. Thalli attached by inconspicuous holdfast.



IDENTIFICATION GUIDE

Valoniopsis pachynema (turf algae)

Thallus filamentous, stiff, coarse, glossy, yellowish-green, bright-green to dark green forming a large pad-like formations to 20 cm in diam., 2–3 cm high, consisting of creeping entangled filaments below, fixed to each other by means of the numerous rhizoids issuing from the filaments.



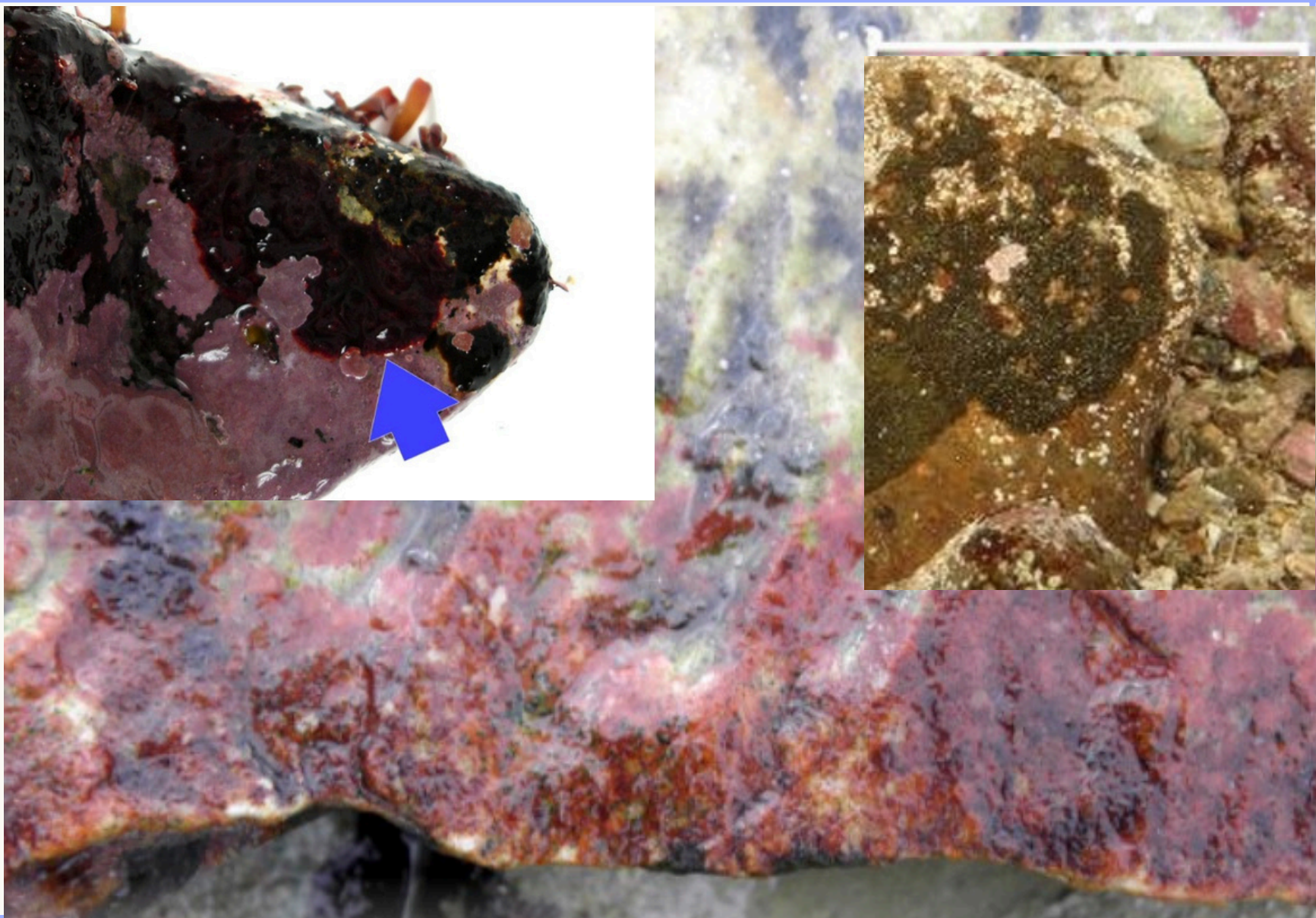
Corallina pilulifera

Red - chalky-grayish violet colour. The ends often have white tips. Thallus is calcified, upright and bushy. Bleaching to white colour. The fronds are normally segmented. Growing mainly on rocks, in tidal pools, in intertidal and upper subtidal.



Encrusting Algae (i.e., *Ralfsia expansia* *Hildenbrandia* spp.)

Thallus form noncalcified crusts with smooth surface, tightly adherent to the substratum, irregular in outline.



IDENTIFICATION GUIDE

Purple Sea Urchin (*Heliocidaris crassispina*)

The diameter is about 60 mm. Dark purple, hemispherical and with strong spines. They are common in the low-shore and subtidal zones of exposed and semi-exposed shores.



Long-spined Sea Urchin (*Diadema setosum*)

The diameter ranges from 8 to 10 cm. It has long spines covering its body with many shorter spines in between. The spines are often black or dark purple in colour with long spines sometime black-and-white banded or white in colour. There are five bright white or blue spots on the test, and the anal cone (periproctal cone) has a distinctive bright orange ring that characterises the species. A common species found on sand flat and seagrass bed, it also lives in coral reefs and subtidal rocky habitats.

