Diadema antillarum (long-spined sea urchin) Disease Training

In mid-February 2022, an extensive die-off of *Diadema antillarum* was recorded in St. Thomas, U.S. Virgin Islands.

By March, additional mortality events had been independently observed elsewhere in the Caribbean and was spreading quickly.

There have been recent reports of dying and sick Diadema in Florida. However, it has not yet been positively confirmed as the same event as the Caribbean die-off.

How will the DRM data help in this effort?

Knowing the location of dying urchins can aid researchers in further reconnaissance and understanding the spatial patterns of this urchin die-off.

Images taken by surveyors can also aid researchers in determining whether the death of an urchin was from the current disease outbreak.

Images also confirm that the sighting was in fact a *Diadema antillarum* and not another similar species.

How are sightings reported?

https://www.agrra.org/sea-urchin-die-off/


Legend
Layers
Basemap gallery
Overview map
Measure
Edit
Details
Print
Green – Healthy Diadema observation
Purple – Suspicious Diadema observation
Red – Confirmed unhealthy Diadema observed
0
150
300mi
POWERED BY esri
Earthstar Geographics

Recording Diadema on your Datasheet

Presence/absence only

Circle **H.Diad** for **healthy** Diadema

Circle **D.Diad** for **sick** or **dead** Diadema. Please do your best to positively identify whether a dead urchin is a Diadema. Look for long spines surrounding the dead urchin. Remember to take pictures of any sick, dying, or dead urchins.

DRM Code:
Surveyor:
Lat:
Long:
Date: Depth:

Transect:
1 / 2 / 3 / 4
Shared? Y / N
Buddy:

Rugosity Msmts:
1. 2. 3.
4. 5. 6.
7. 8. 9.
10.

P/A
H.Diad.
D.Diad.
ACER
APAL
DCYL

Habitat:
Isolated Reef
Contiguous Reef Spur and Grv.
Contiguous Reef Other
Reef Rubble

						Tissue Loss Disease					
Species Code	Width (cm)	Height (cm)	Bleaching P, PB, BL	% Old Mort	Other % Recent Mort	Disease % Recent Mort	TL Rate Fast, Slow	Disease Conditon(s)	Other Condition(s)	Scientific Name Transect 3 & 4 in Grey	Sp. Codes
1										*Colpophyllia natans*	CNAT
2										*Dichocoenia stokesii*	DSTO
3										*Diploria labyrinthiformis*	DLAB

Stages of Mortality

Observations of healthy, sick, dying and dead urchins

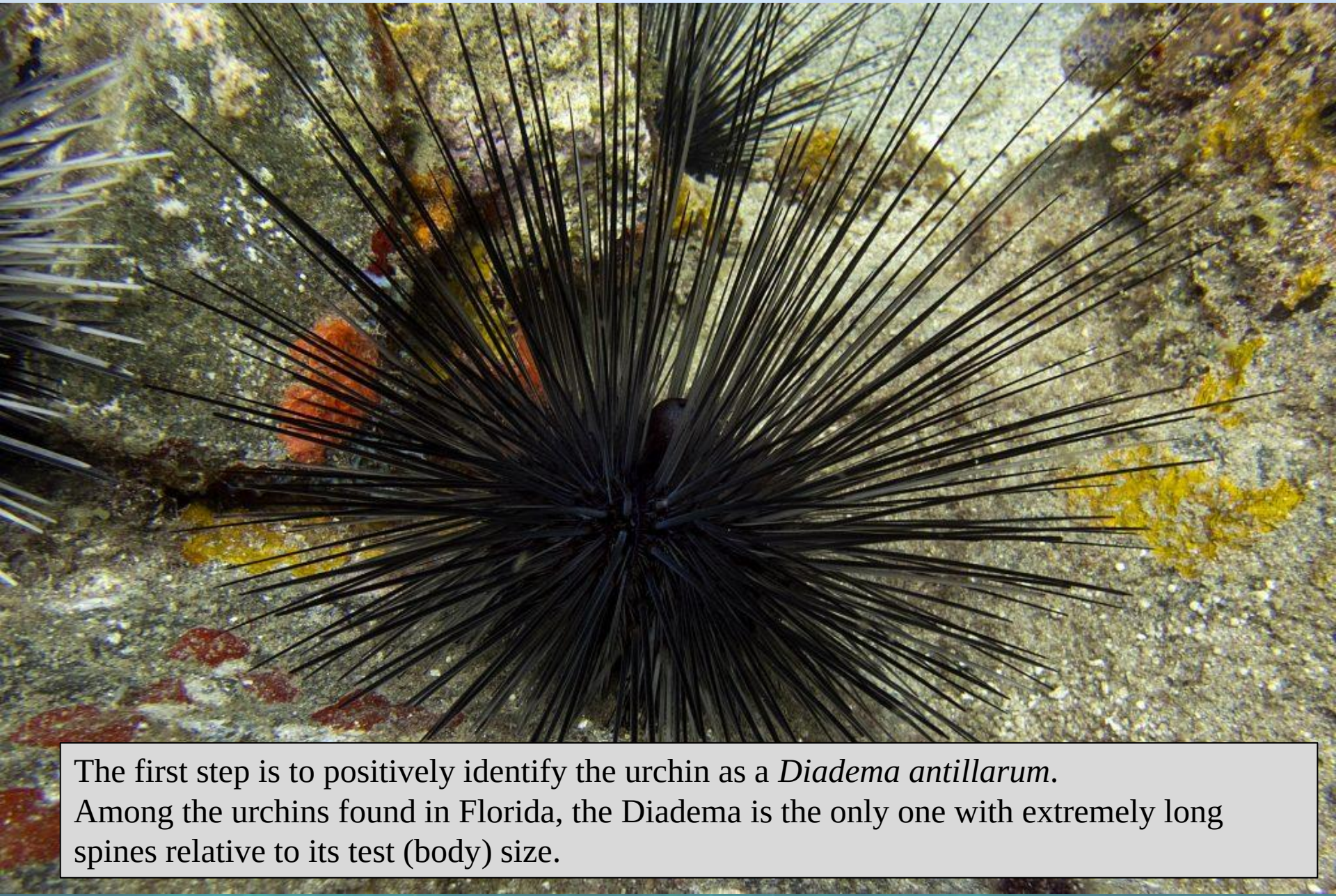
Healthy – Urchins have no visible lesions or symptoms, intact spines and exhibit normal spine movement when stimuli are received.

Sick – Several signs or stages of illness occur over time, although signs progress rapidly (1-2 days)

- Sick urchins may have excess mucous on spines, although spine movement may appear normal.
- Urchins may lose the use of tube feet and become unable to attach to the substrate. They may be swept off their habitat and float in the water unable to control motion or re-adhere. Spine movement is less active; spines may not respond to touch as quickly.
- Urchins start to lose spines until they eventually fall off (~2 days); tissue may slough off, although test and mouth structures are still intact. Majority of urchins present affected.

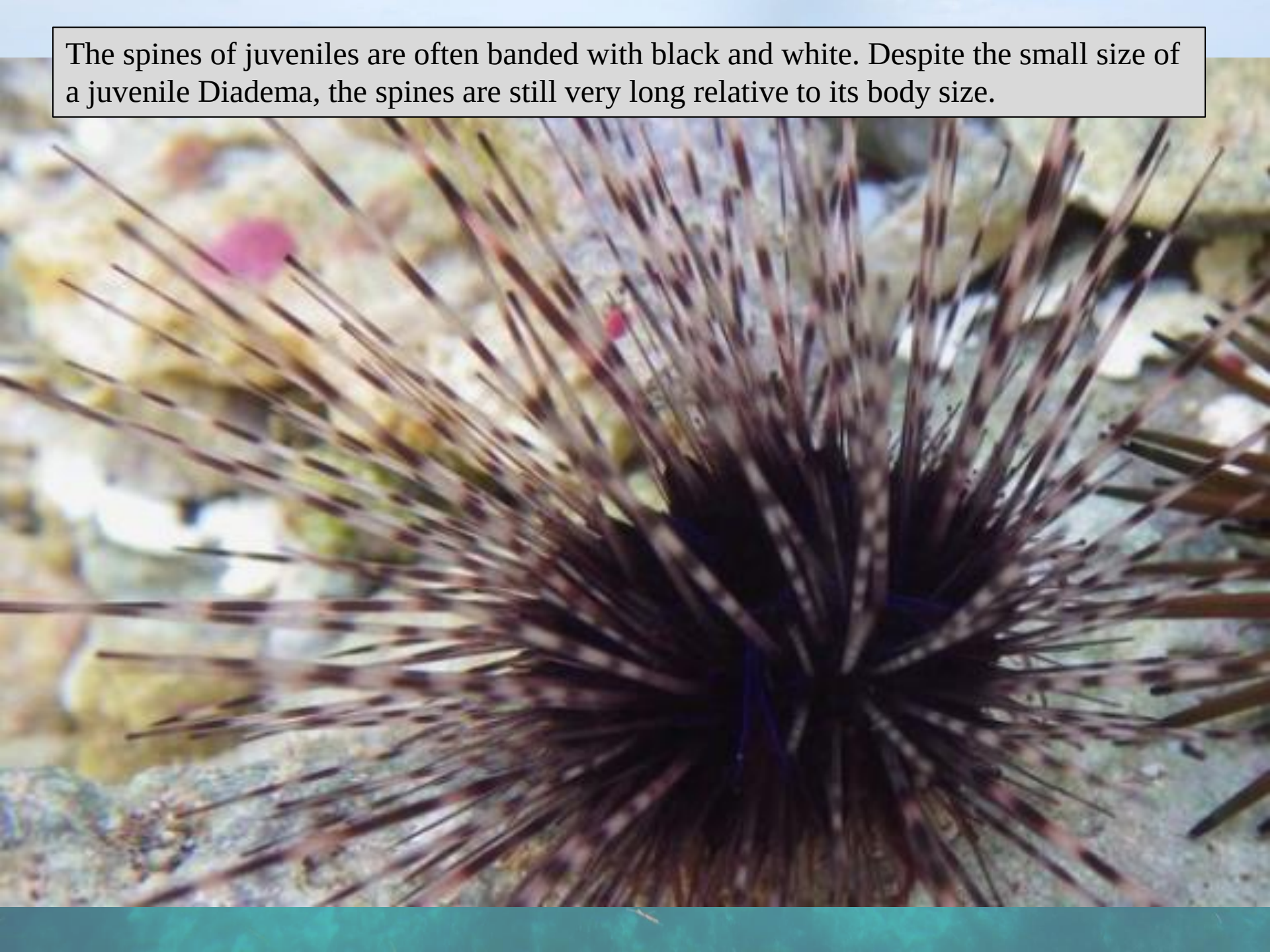
Dead – urchin may or may not have visible lesions, no movement of spines at all when prodded, not attached to substrate, skeleton is exposed with loss of spines, completely white skeleton with no spines. Numerous dead urchins.

Urchin Identification



The first step is to positively identify the urchin as a *Diadema antillarum*.
Among the urchins found in Florida, the Diadema is the only one with extremely long spines relative to its test (body) size.

The spines of a mature adult are typically black, but white spines may be intermixed as seen here in these four Diadema

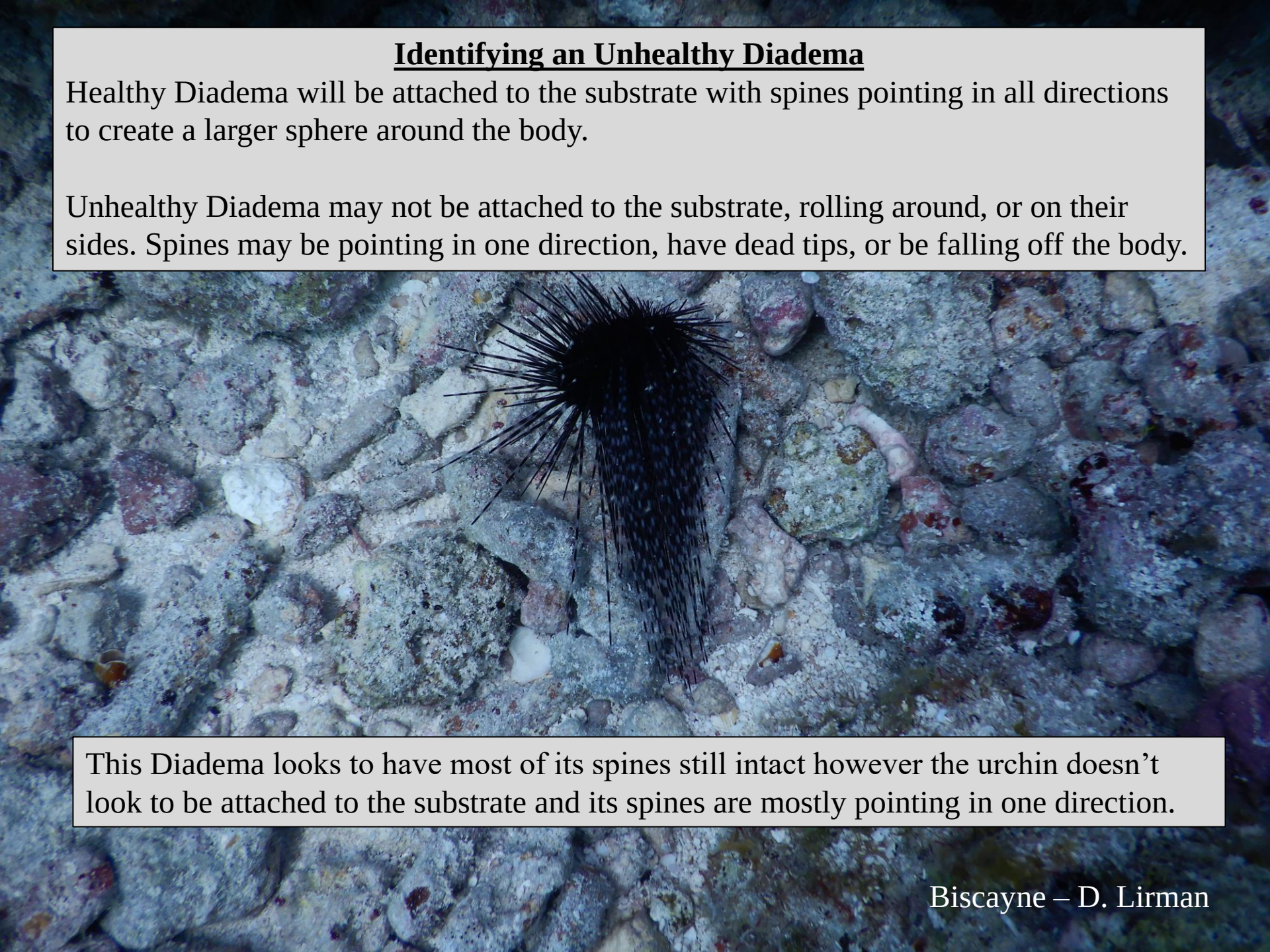


The spines of juveniles are often banded with black and white. Despite the small size of a juvenile Diadema, the spines are still very long relative to its body size.

Identifying an Unhealthy Diadema

Healthy Diadema will be attached to the substrate with spines pointing in all directions to create a larger sphere around the body.

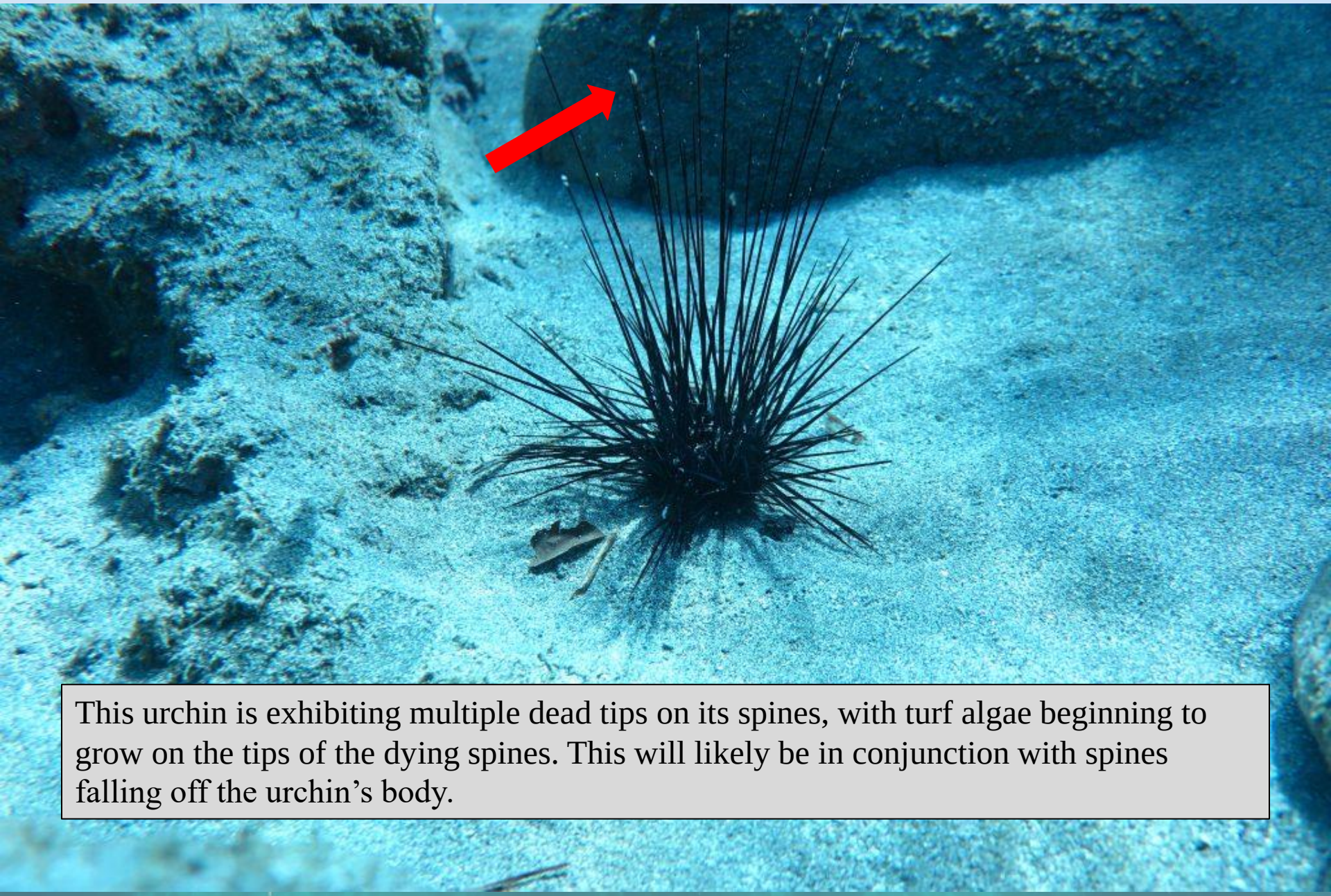
Unhealthy Diadema may not be attached to the substrate, rolling around, or on their sides. Spines may be pointing in one direction, have dead tips, or be falling off the body.



This Diadema looks to have most of its spines still intact however the urchin doesn't look to be attached to the substrate and its spines are mostly pointing in one direction.

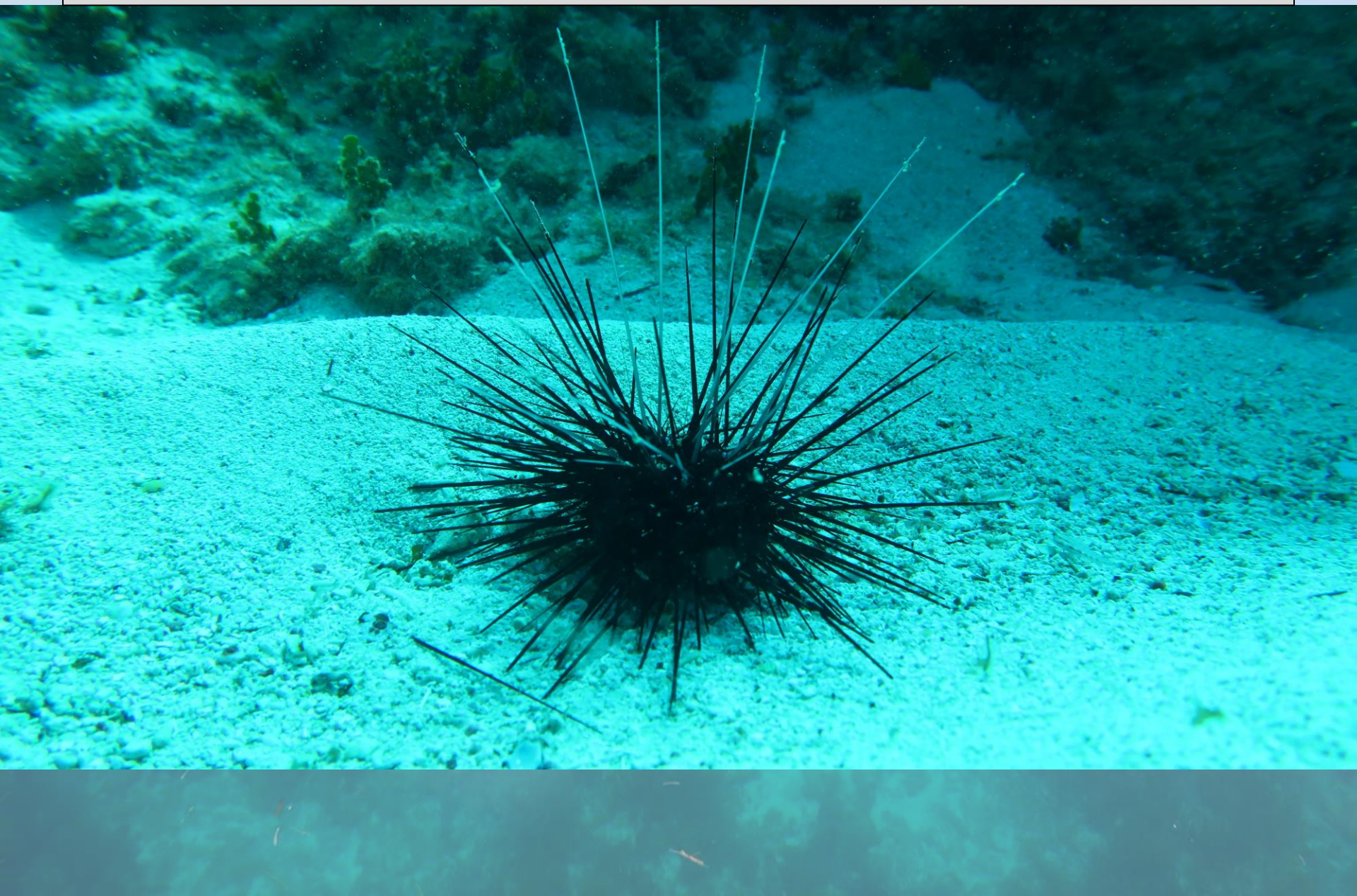
Biscayne – D. Lirman

Again, note the directions of the Diadema’s spines. Normally the spines would be rounded and extending in all directions unless wedged in a rock or crevasse. This Diadema has most of its spines pointed up suggesting that it may be sick.

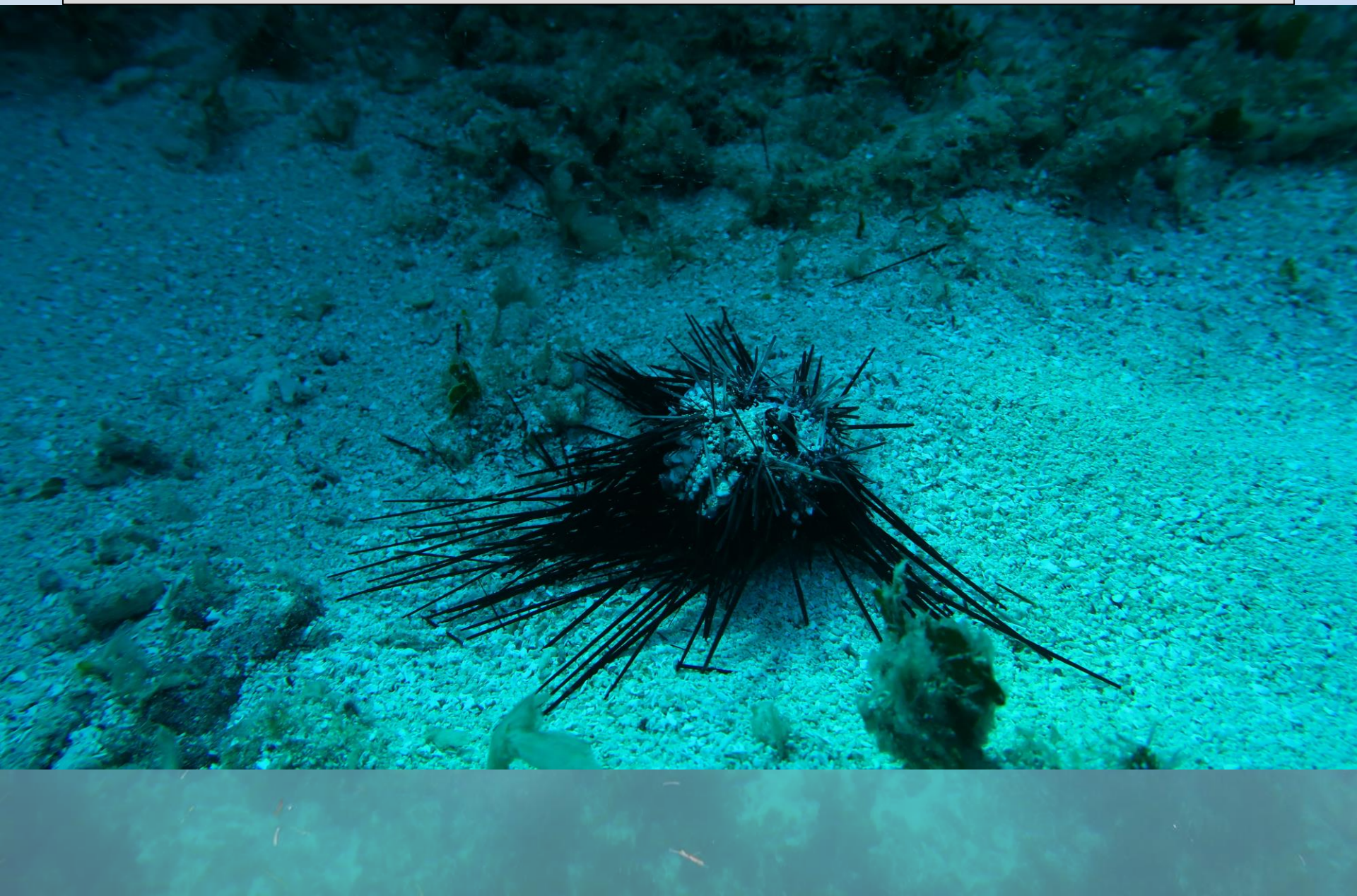


This urchin is exhibiting multiple dead tips on its spines, with turf algae beginning to grow on the tips of the dying spines. This will likely be in conjunction with spines falling off the urchin's body.

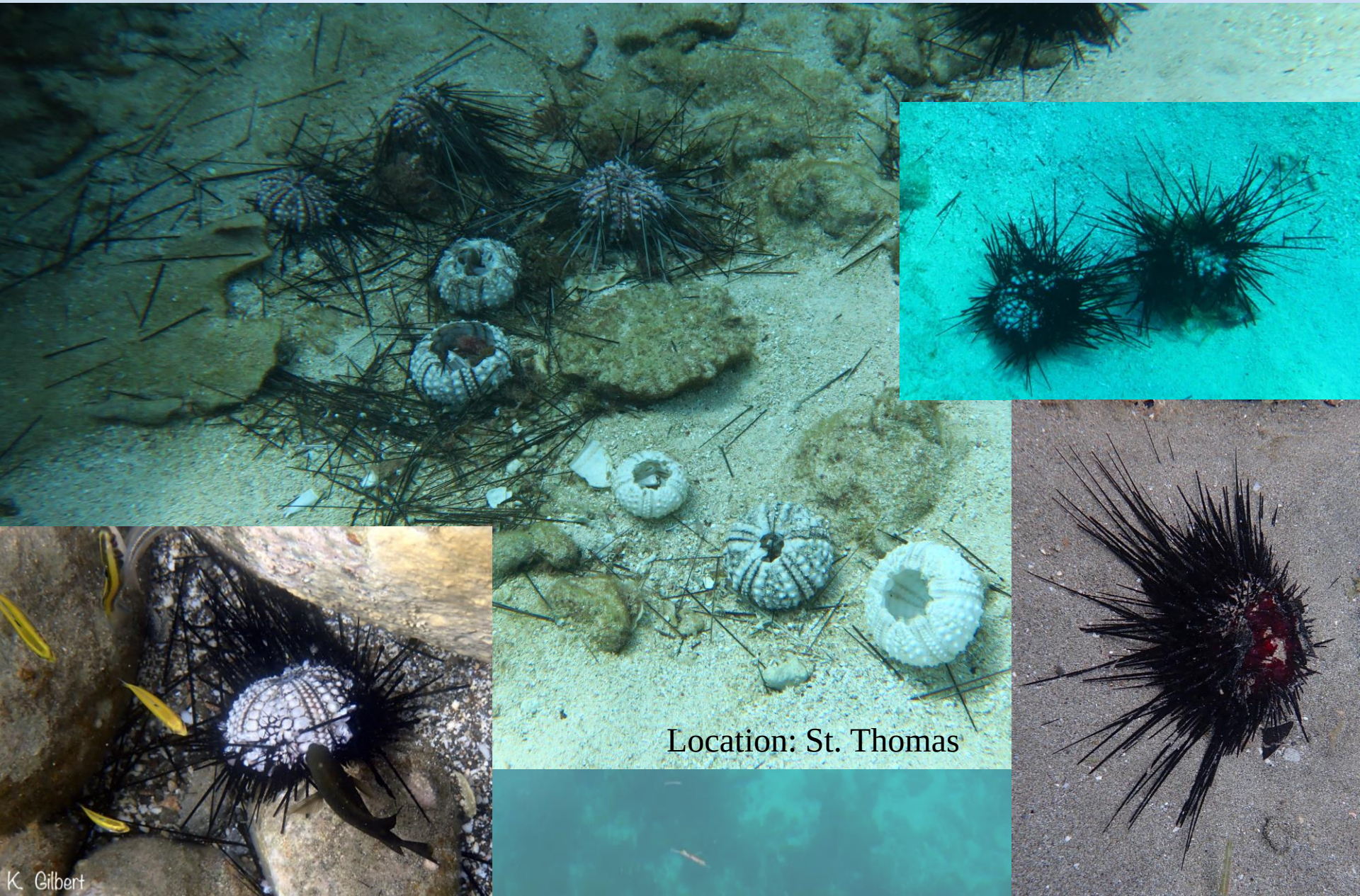
If you see loose spines surrounding an urchin, it is likely becoming necrotic and beginning to lose the tissue holding the spines to the body or “test”.

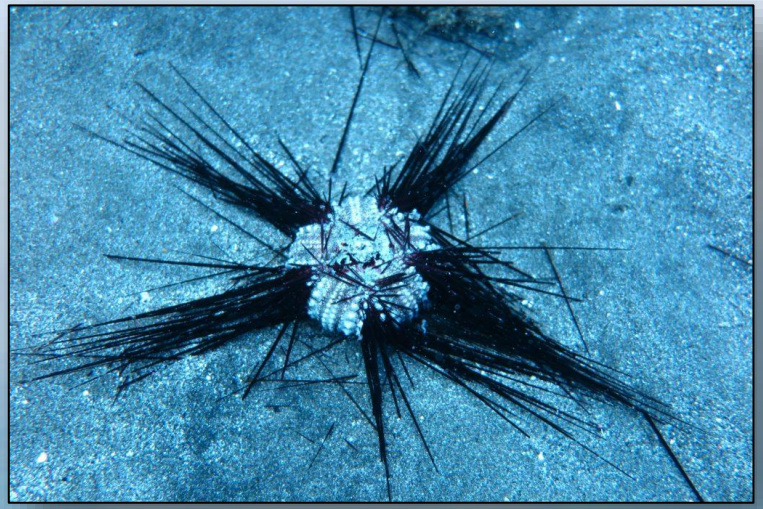


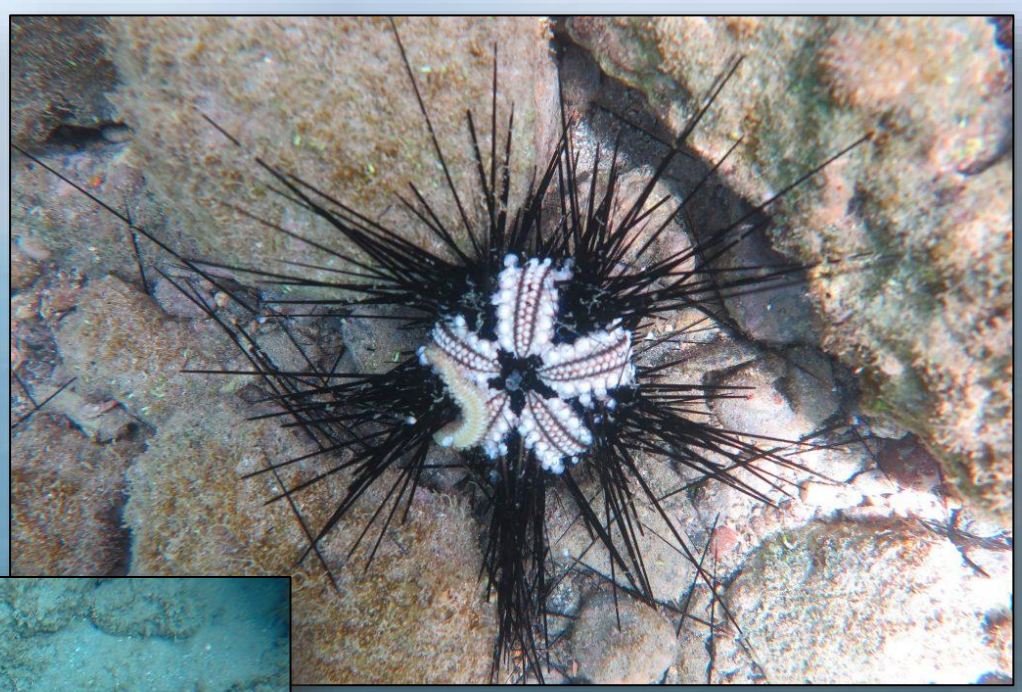
Necrotic *Diadema antillarum.* Note the visible white test and spines that have fallen off the body.

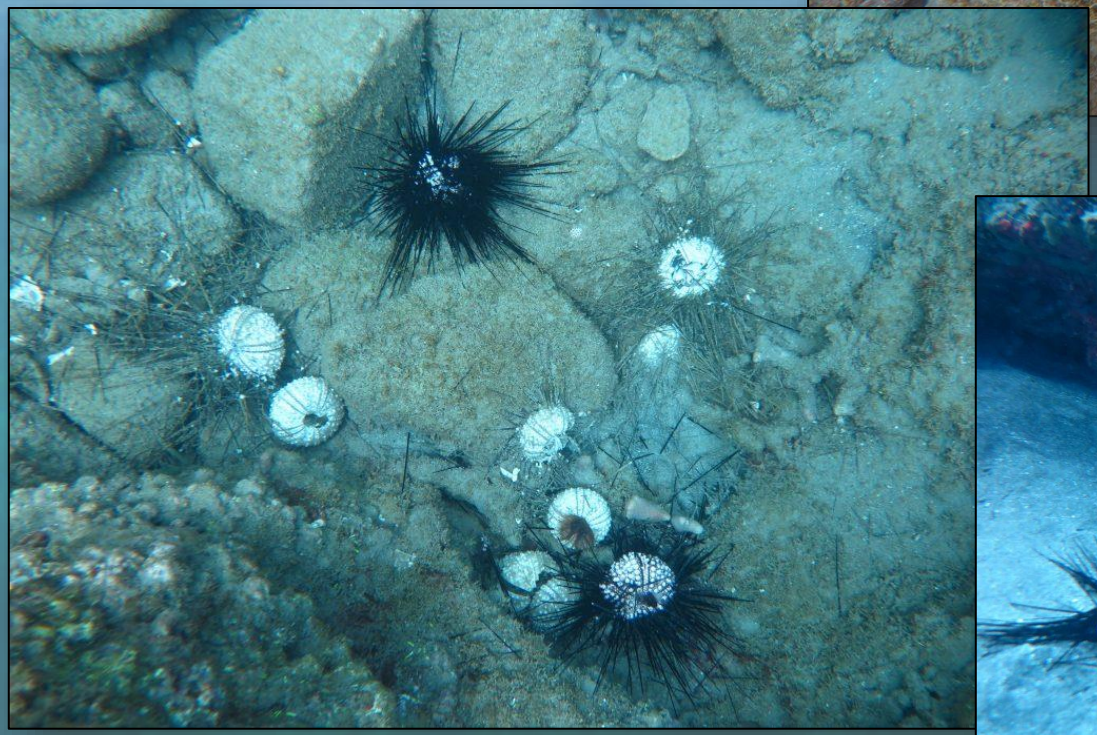


More examples of dying and dead *Diadema antillarum.*





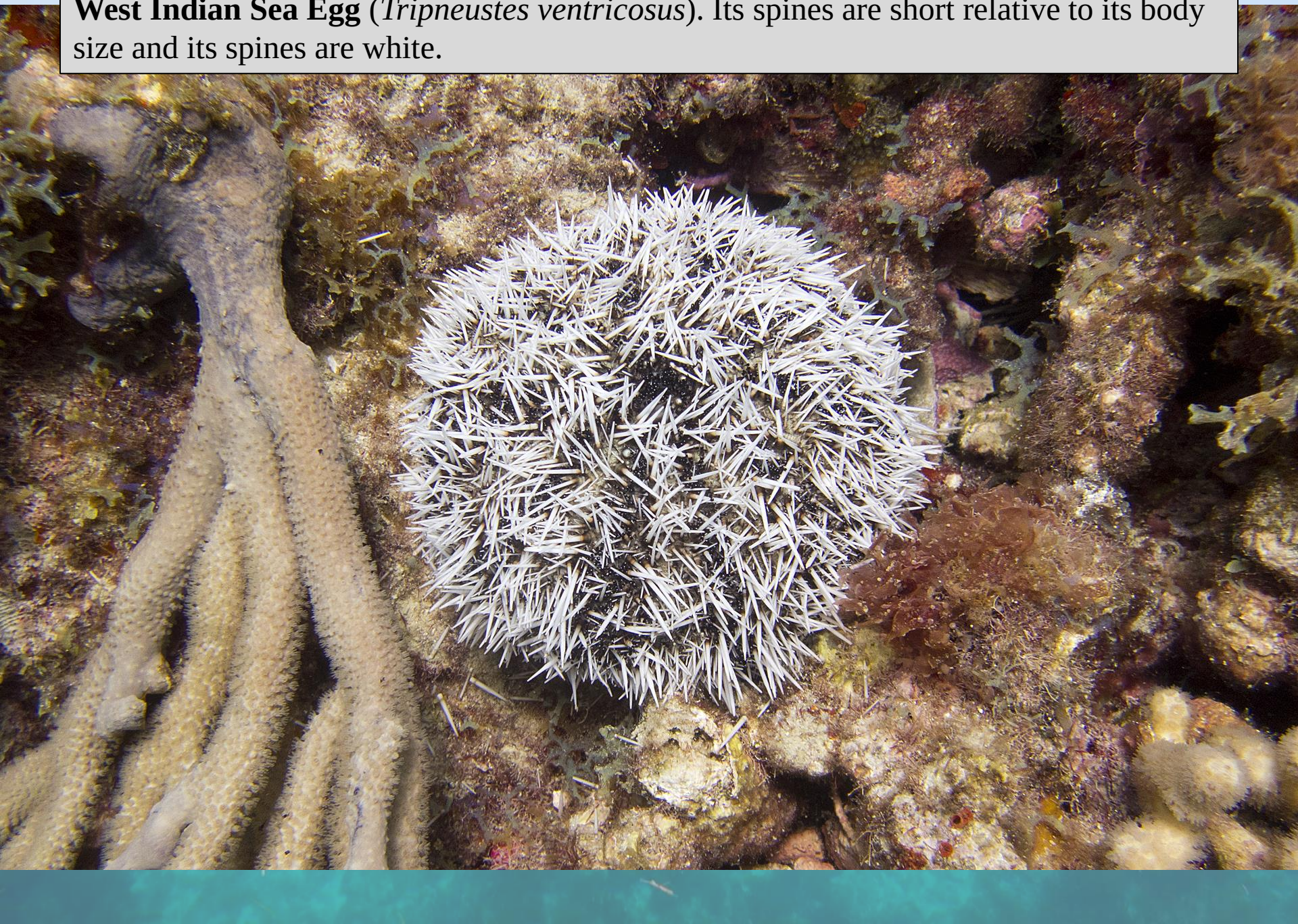




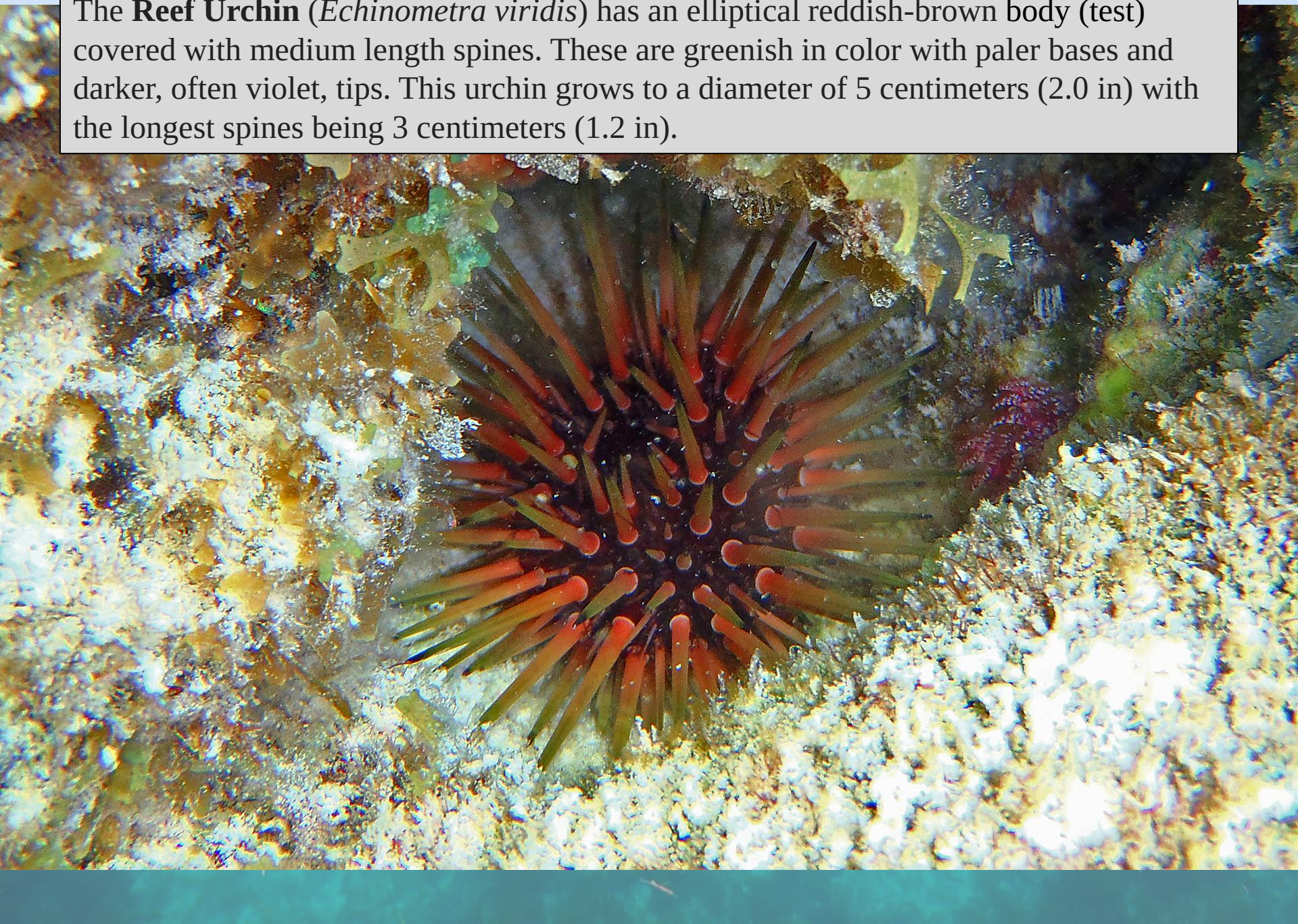
Other Urchin Species

(NOT Diadema)

Do not record



West Indian Sea Egg (*Tripneustes ventricosus*). Its spines are short relative to its body size and its spines are white.



The **Reef Urchin** (*Echinometra viridis*) has an elliptical reddish-brown body (test) covered with medium length spines. These are greenish in color with paler bases and darker, often violet, tips. This urchin grows to a diameter of 5 centimeters (2.0 in) with the longest spines being 3 centimeters (1.2 in).

The **Rock Boring Urchin** *(Echinometra lucunter)* has an elliptical rather than a round body (test). It can grow to a diameter of about 8 centimetres (3.1 in). It has moderately short spines with wide bases and sharp tips. The colour of the test varies from black to deep brownish-red. The spines are usually black.

The Pencil Urchin (*Eucidaris tribuloides*) has widely spaced, thick, stubby spines.

Once the DRM survey season is complete, all presence/absence data of healthy and diseased Diadema will be submitted to AGRRA along with any images submitted by you, the surveyors.

Or, if you would like to submit your own report, you are more than welcome to do so and potentially provide a greater level of detail including Diadema counts and life stage. If you do, just send me a quick email to let me know so we are not duplicating the information in the AGRRA website.

Reports can be submitted to AGRRA Diadema Response Network: https://www.agrra.org/sea-urchin-die-off/

Once on the site, click the 'Submit Diadema Report' link.

By clicking the link, you will be directed to a form where you will fill out your contact information and provide your observation data. You can also upload images to supplement your report to aid AGRRA researchers in verifying your information.