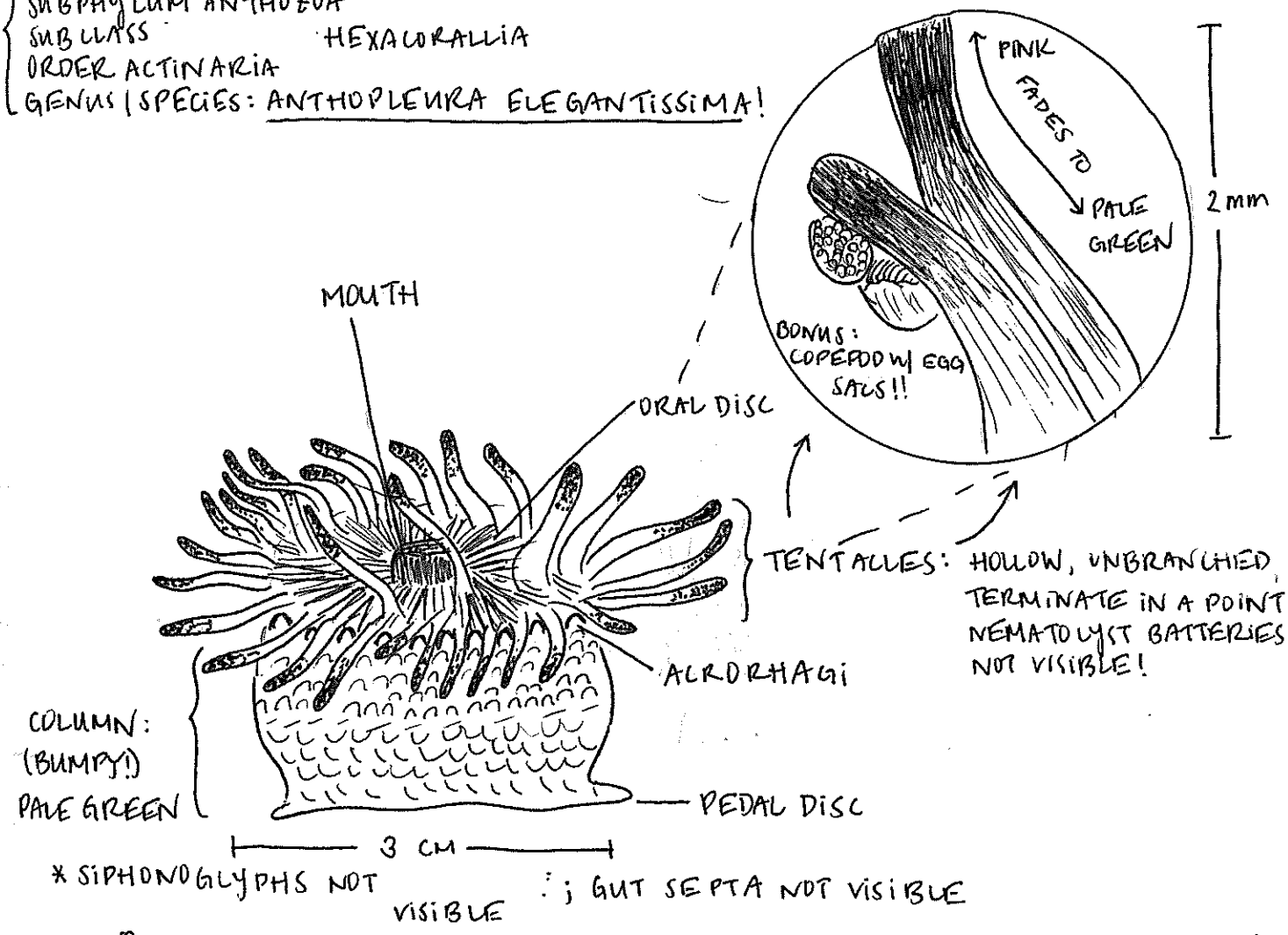
PHYLUM CNIDARIA: SUBPHYLUM ANTHOZOA // 04.04.2017

① STRUCTURE:

- PHYLUM CNIDARIA
- SUBPHYLUM ANTHOZOA
- SUBCLASS HEXACORALLIA
- ORDER ACTINARIA
- GENUS | SPECIES: ANTHOPLEURA ELEGANTISSIMA!

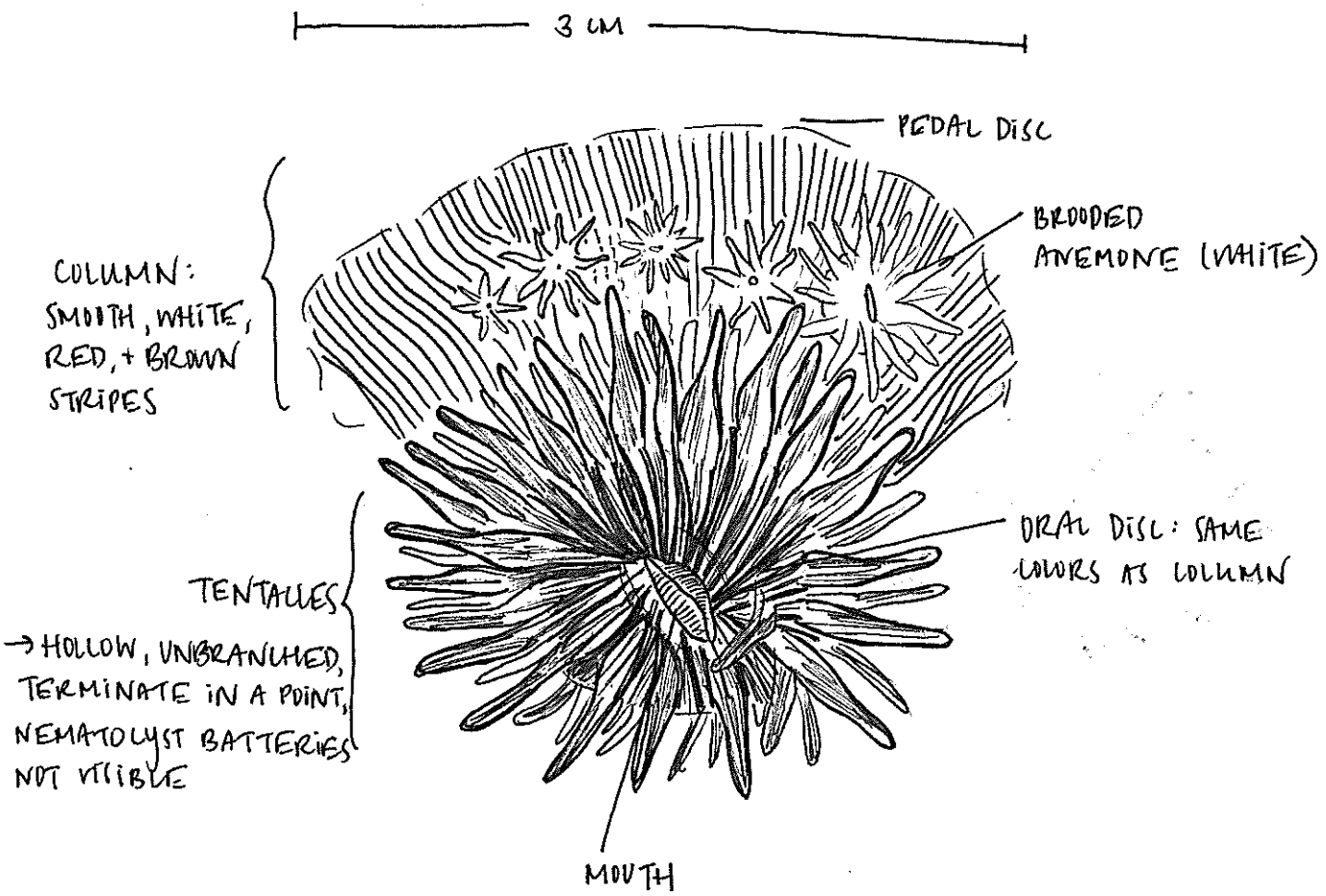


notes: · tentacles drifting (seemingly aimlessly); some are covered with sand or even small animals (see copepod drawing above)

- oral disc holds tentacles; mouth is entrance point for food + exit for excrement; tentacles are used for stunning prey (w/ nematocytes); acrorhagi used for defending territories against unspecifics; siphonoglyph cilia used to create currents of water into the pharynx; column is for support and protection when deflated); gut septa provide support and increased surface area for digestion (gastroderms); pedal disc is for attachment to substrate
- found the zooxanthellae, but not the zoochlorellae in the tentacles of this organism

STRUCTURE (CONTINUED):

- PHYLUM CNIDARIA
- SUBPHYLUM ANTHOZOA
- SUB CLASS HEXACORALLIA
- ORDER ACTINARIA
- GENUS | SPECIES: EPIACTIS PROLIFERA!



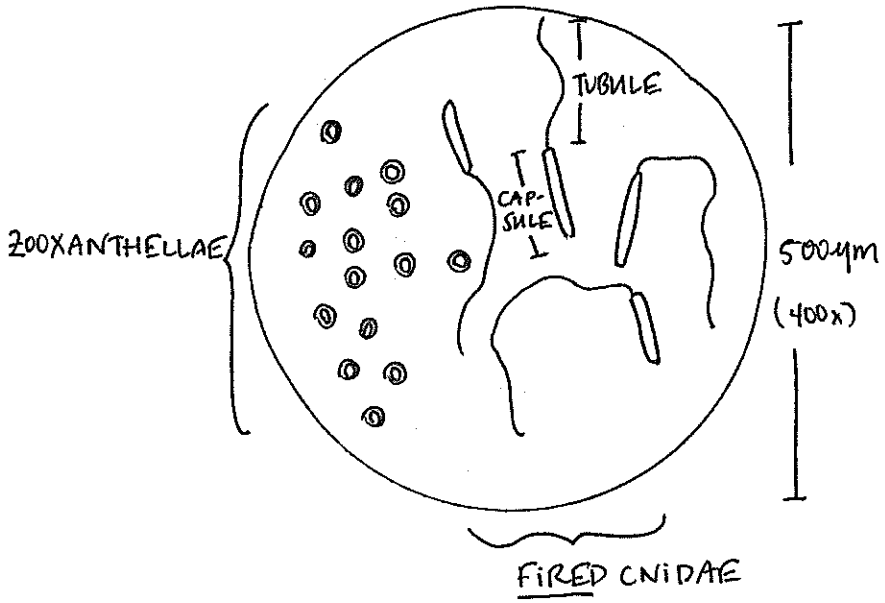
* DRAWN UPSIDE-DOWN NOT BECAUSE IT DEFIES GRAVITY, BUT BECAUSE OF PLACEMENT IN DISH!
* SIPHONOGLYPHS NOT VISIBLE; GUT SEPTA VISIBLE ON BROODS BUT NOT ADULT

Notes: see other side for functions of each of the structures *

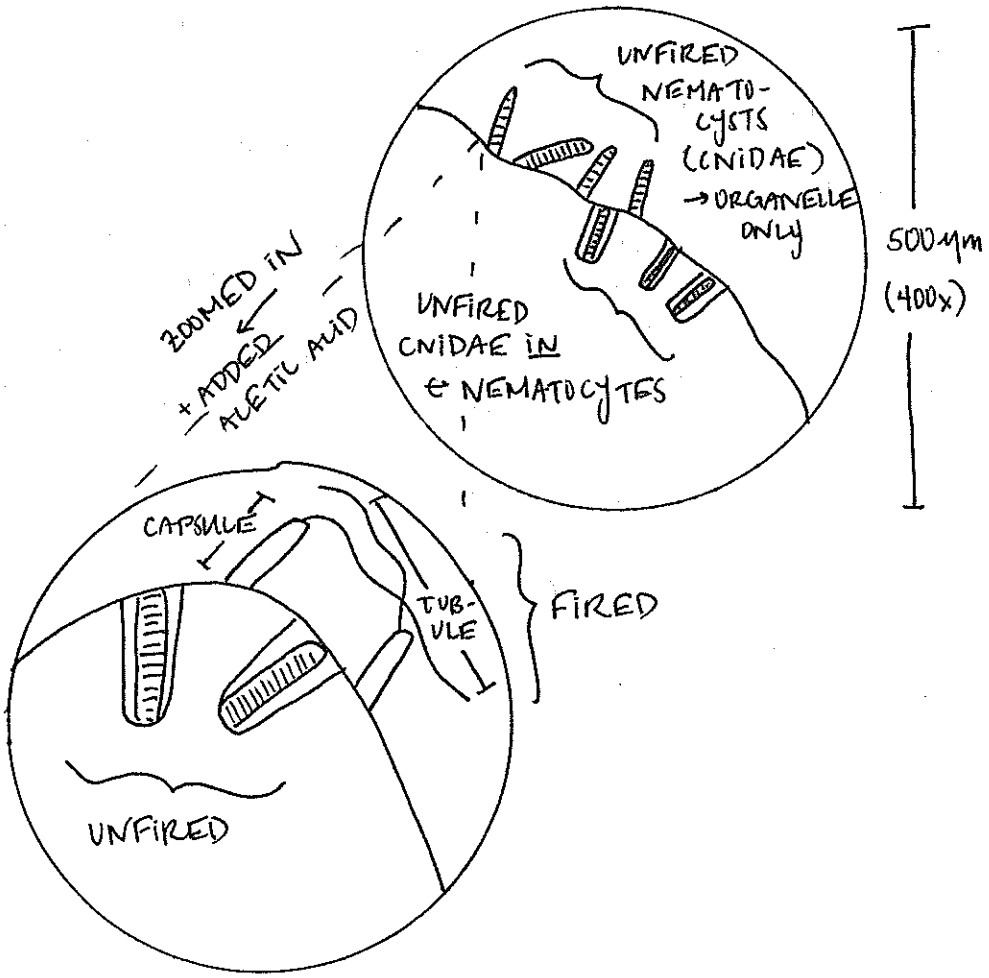
- found on a bowl of calcareous algae and other epibionts
- broods were of all different sizes
- compared to Epiactis lisbethae, this organism is much more brown-red than bright red

① NEMATOCYSTS (CNIDOCYTES):

* USED ANTHOPLEURA ELEGANTISSIMA TENTACLE:



* AND THEN METRIDIUM SPP. ACONTIA



* ADDING A DROP OF ACETIC ACID CAUSED MANY MORE! NEMATOCYSTS TO DISCHARGE THAN JUST PULLING THE ACONTIA/TENTACLE OFF

(III) FEEDING BEHAVIOR: ANTHOPLEURA, EPIACTIS, OR METRIDIUM

* FED ARTEMIA BRINE SHRIMP TO ANTHOPLEURA.

Observations: ANTHOPLEURA: Stung the Artemia (several organisms per tentacle), then purged before slowly curling the tentacle toward its mouth. This action happened fairly slowly, especially relative to the anemone being touched by a human. From the angle at which I was viewing the encounter, the siphonoglyphs were not present, but the mouth opened slowly as the tentacles retracted, almost in sync. Approximately 5 minutes after capturing a brine shrimp, the tentacle relaxed back out. Because not all of the brine shrimp were caught immediately, this process of feeding occurred for some time, approximately

ARTEMIA: Those that were not initially stung swam away. Those that were stung fought hard, but resistance was futile. Eventually, they were stung so much that they could not move off the tentacle, and ultimately were consumed. Some brine Artemia sought refuge in between the tentacles of the Anthopleura and continued to swim around, but soon met the same fate. Eventually, those that remained swam toward the right corner.

(IV) LOCOMOTION: OBSERVED POSITION OF EPIACTIS LISBETHAE, ANTHOPLEURA ELEGANTISSIMA, + METRIDIUM SENILE OVER A FEW DAYS:

	DAY 1 (04|05|17)	DAY 2 (04|06|17)	DAY 3 (04|07|16)
EPIACTIS	* ON FALCON TUBE, FORCED OFF FOR OBSERVATION TO CENTER OF GLASS DISH	* MOVED HALFWAY OUT OF SAID GLASS DISH	* MOVED BACK INTO CENTER OF DISH
ANTHOPLEURA	* IS IN CORNER OF GLASS DISH	* IN SAME PLACE; HAS NOT (SEEMINGLY) MOVED	* IN SAME PLACE; AGAIN, HAS NOT MOVED
METRIDIUM	* ON UPPER LIP|OUTSIDE EDGE OF GLASS DISH	* HAS MOVED ~1 CM TO MOSTLY OUT OF DISH.	* MOVED ~3 CM BACK INTO CENTER OF DISH

HYDROSTATIC SKELETON: Anthozoans have both circular + longitudinal muscles, and they work in opposition to create a hydrostatic skeleton. To elongate, an anemone will close its mouth (so water won't escape) and relax the longitudinal muscles while contracting the circular muscles. By doing so, the longitudinal muscles are stretched by the elevated water pressure. Conversely, to expel water and flatten, the anthozoan need only contract its longitudinal muscles while its mouth is open. This reaction can occur rapidly; in response to predation or being stepped on, for example.

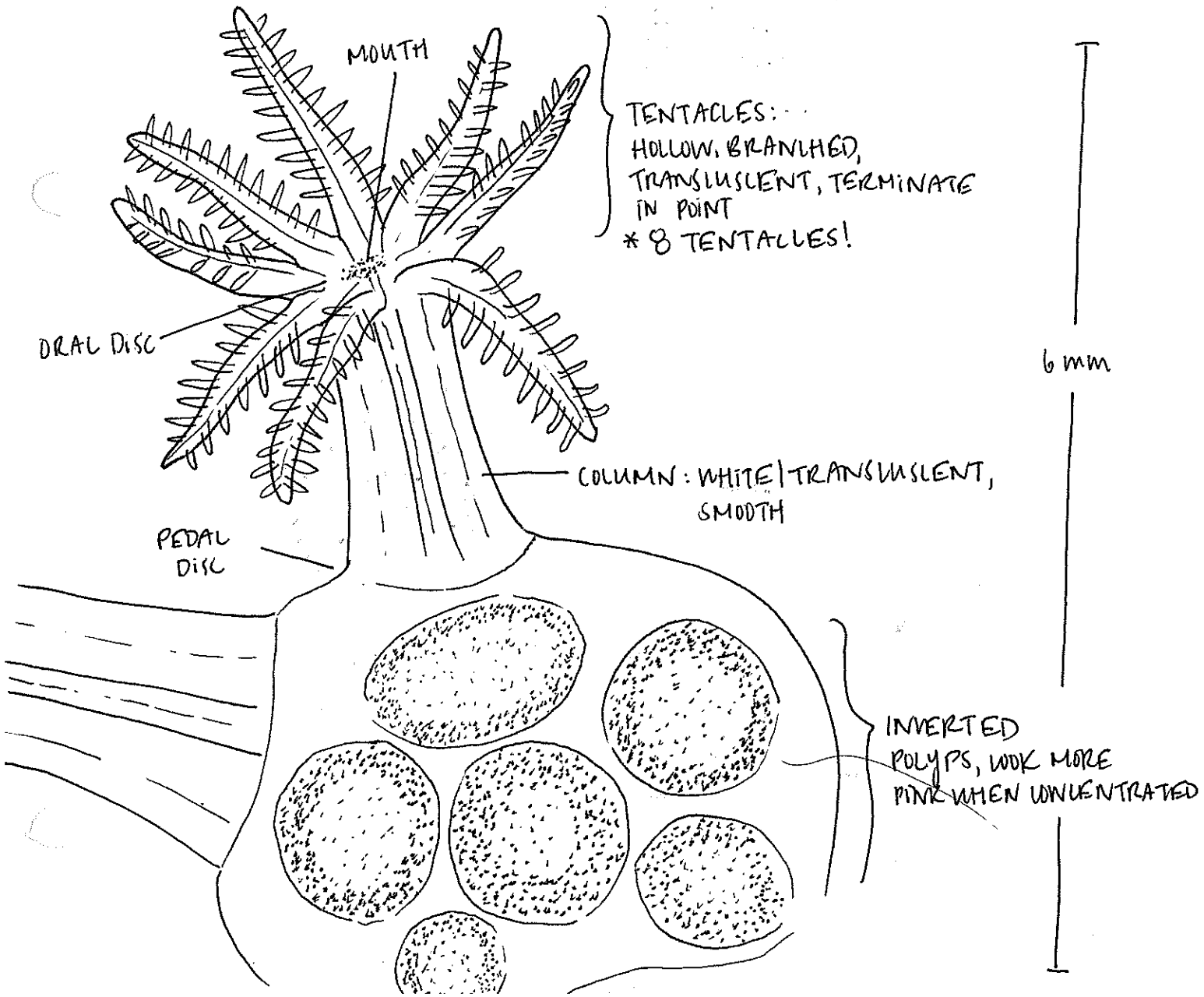
(V) SYMBIOSIS: TOOK SMALL PIECE OF A. ELEGANTISSIMA TENTACLE + SQUASHED IT ON A SLIDE. RESULTS:

- ZOOXANTHELLAE: Are distinguishably more golden brown than bright green. At high power (400x), the nucleus of these dinoflagellates are visible.
- ZOOCHLORELLAE: Are smaller (~1/4 size) of zooxanthellae, and are much more "true" green and perfectly round.

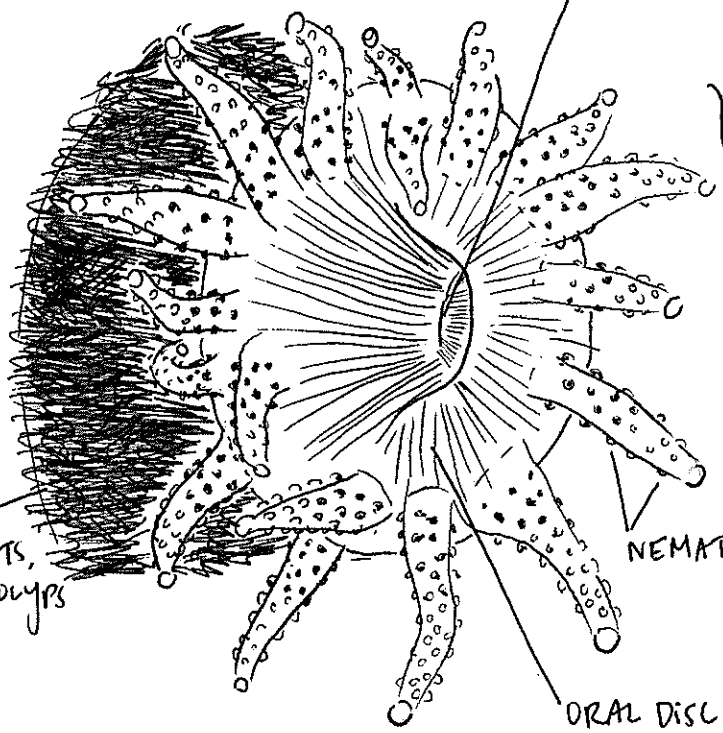
→ These photobionts provide fatty acids, glucose, and nutrients to their host, and in return the photobiont receives a protected environment and the compounds required for photosynthesis. (CO_2 + Nitrogen)

(VI) CORAL DIVERSITY:

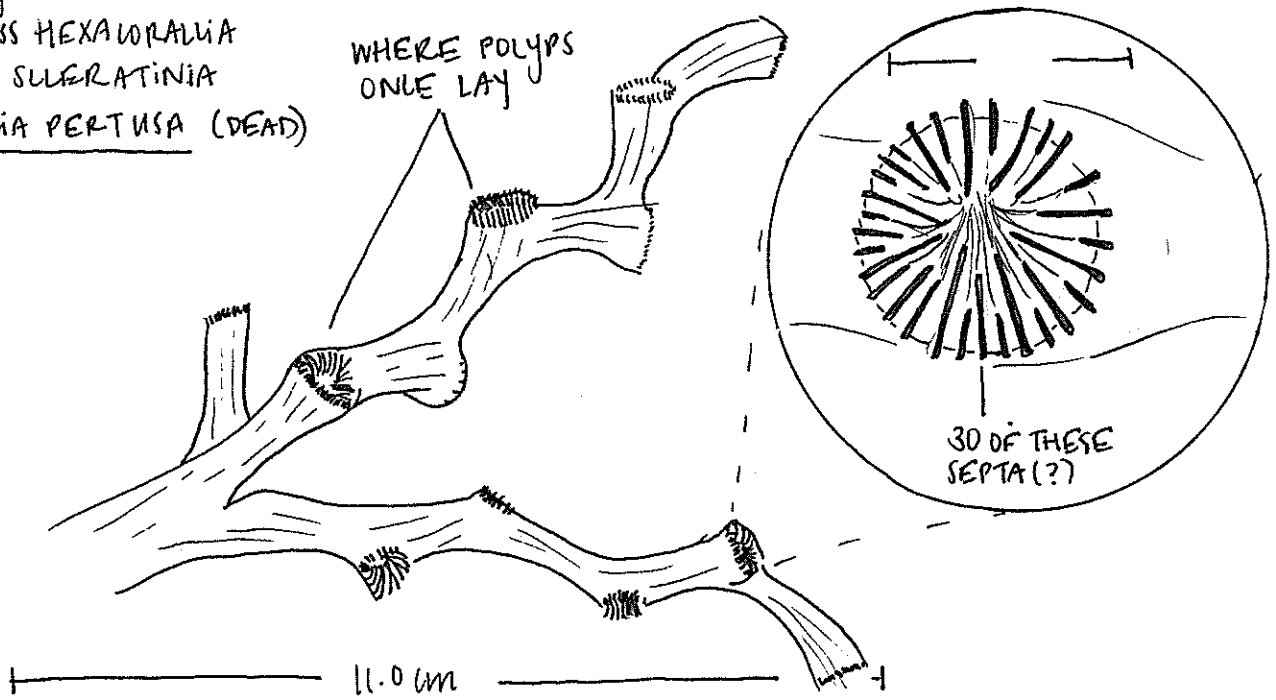
- PHYLUM CNIDARIA
- SUBPHYLUM ANTHOZOA
- SUBCLASS OCTOCORALLIA
- ORDER ALCYONACEA
- GENUS | SPECIES: DISCOPHYTON RUDYI



PHYLUM CNIDARIA
SUBPHYLUM ANTHOZOA
SUBCLASS HEXACORALLIA
ORDER SCLERATINIA
BALANOPHYLLIA ELEGANS

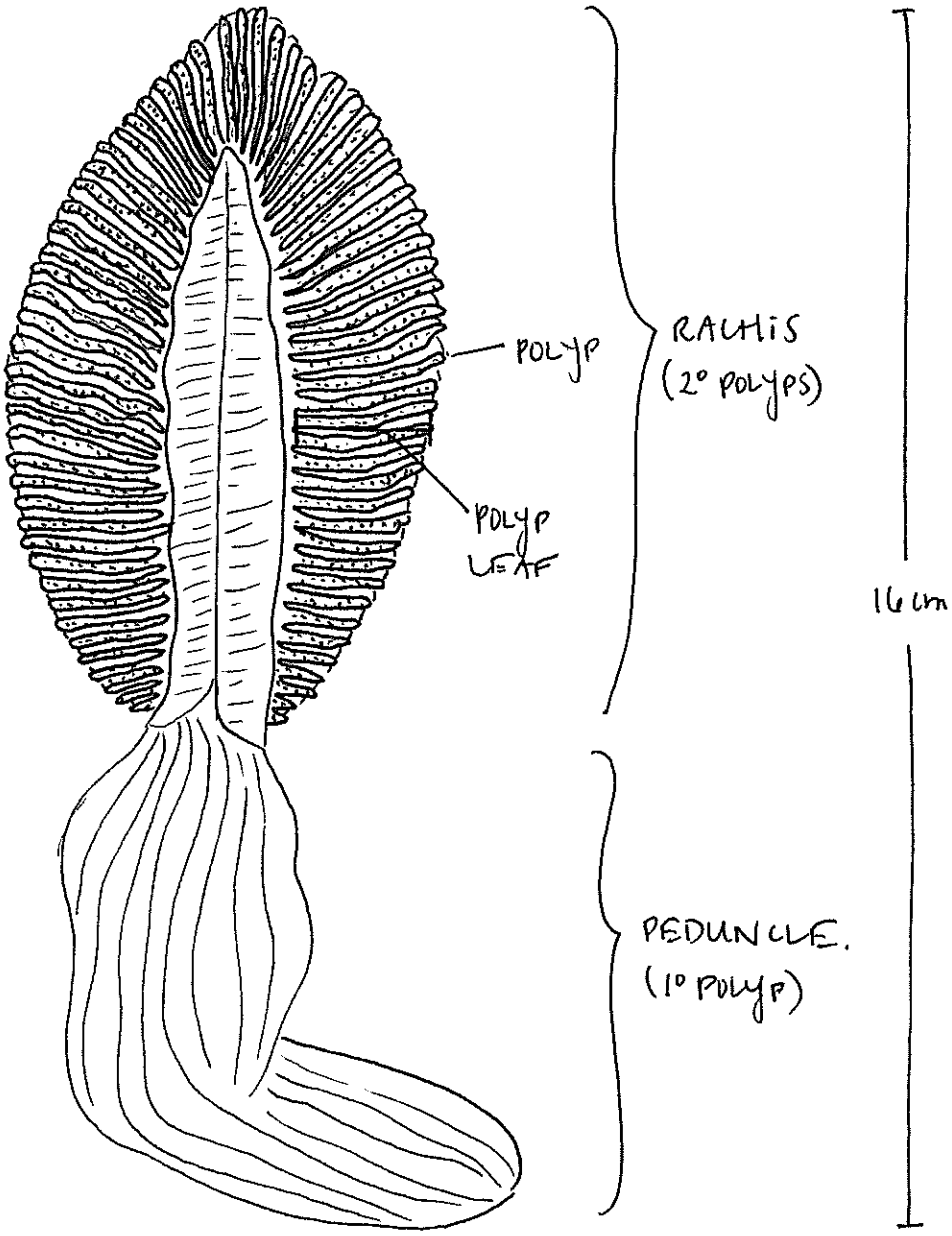


PHYLUM CNIDARIA
SUB PHYLUM ANTHOZOA
SUBCLASS HEXACORALLIA
ORDER SCLERATINIA
LOPHELIA PERTUSA (DEAD)



* BODY WHITE BOTH DEAD + ALIVE — because this organism lives in the deep sea, where light does not penetrate, it does not need to produce pigment (an energy-taking trait) or have a photobiont

PHYLUM CNIDARIA
SUBPHYLUM ANTHOZOA
SUBCLASS OCTOCORALLIA
ORDER PENNATULACEA
PTILOSARCUS GURNEYI

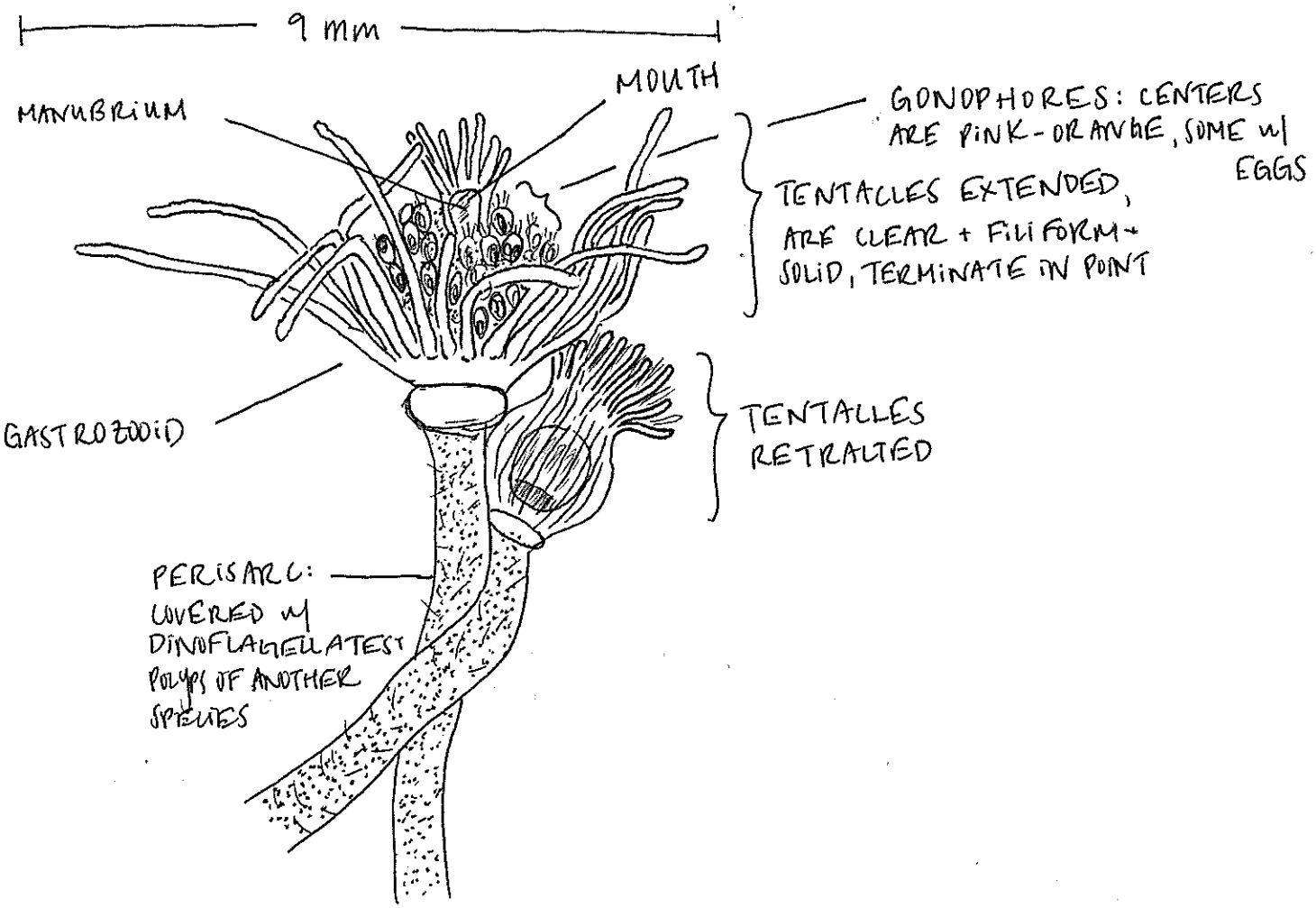


Notes: 1° POLYP: AXIAL and ANCHORING BULB
2° POLYPS: AUTOZOOIDS for feeding and SIPHONOZOOIDS for water intake and circulation!
* AS PRESERVED, TONICS light peachy pink

PHYLUM CNIDARIA: SUBPHYLUM MEDUSAZOA // 04.06.2017

PHYLUM CNIDARIA
SUBPHYLUM MEDUSAZOA
CLASS HYDROZOA
ORDER ANTHOTHECATAE
TUBULARIA * COLLECTED FROM D-DOCK, CHARLESTON BOAT BASIN

① STRUCTURE

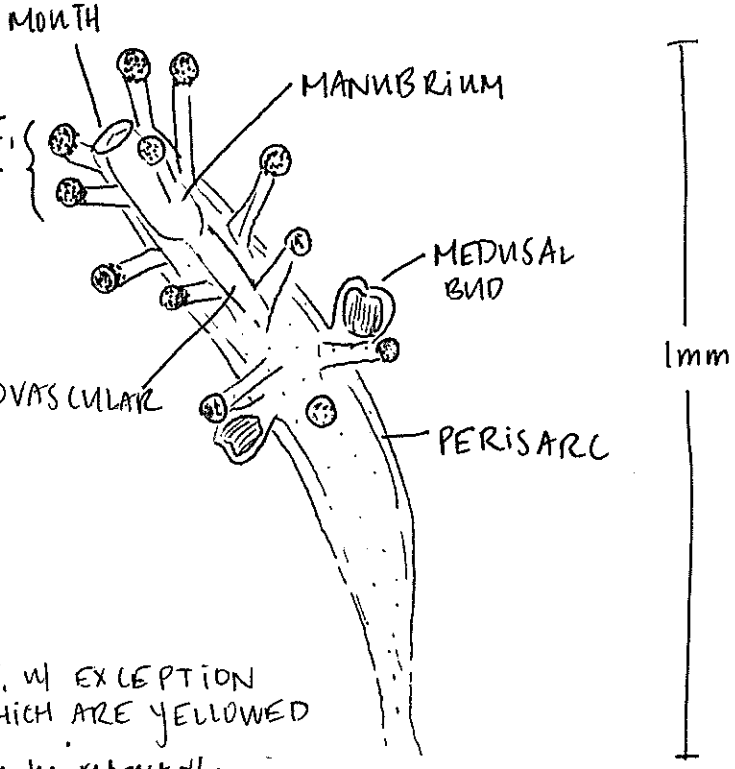


notes: * individual zooids did not respond to physical touch or light; they seemed entirely content in having their tentacles extended and feeding

* identified as a female gonozooid because the zooids have apical processes; some contain eggs
* function of structures: gonozooids/gonopores are for reproduction; tentacles are for feeding and stinging prey; gastrozooid is for feeding; apical tentacles are for moving food into mouth; manubrium is for digestion; mouth is for beginning digestion process; perisarc is for protection and support.

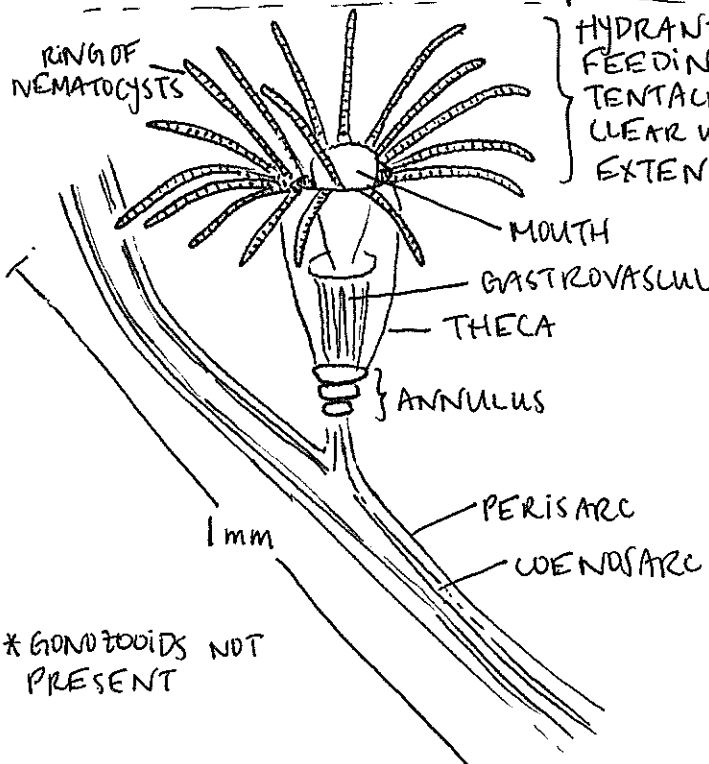
STRUCTURE (CONT.):

PHYLUM CNIDARIA
SUBPHYLUM MEDUSAZOA
CLASS HYDROZOA
ORDER ANTHOTHECATAE
CORYNE SP



notes:

* BODY CLEAR-WHITE, W/ EXCEPTION OF MEDUSAE BUDS, WHICH ARE YELLOWED
* ZOOIDS respond to touch by retracting, do not seem to respond to light
* function of structures: capitate tentacles are for delivering an especially strong sting to prey; medusa buds are reproductive organs (others are same as Tubularia)



PHYLUM CNIDARIA
SUBPHYLUM MEDUSAZOA
CLASS HYDROZOA
ORDER LEPTOTHECATAE
OBELIA SP.

GASTROZOOID

* GONOZOOIDS NOT PRESENT

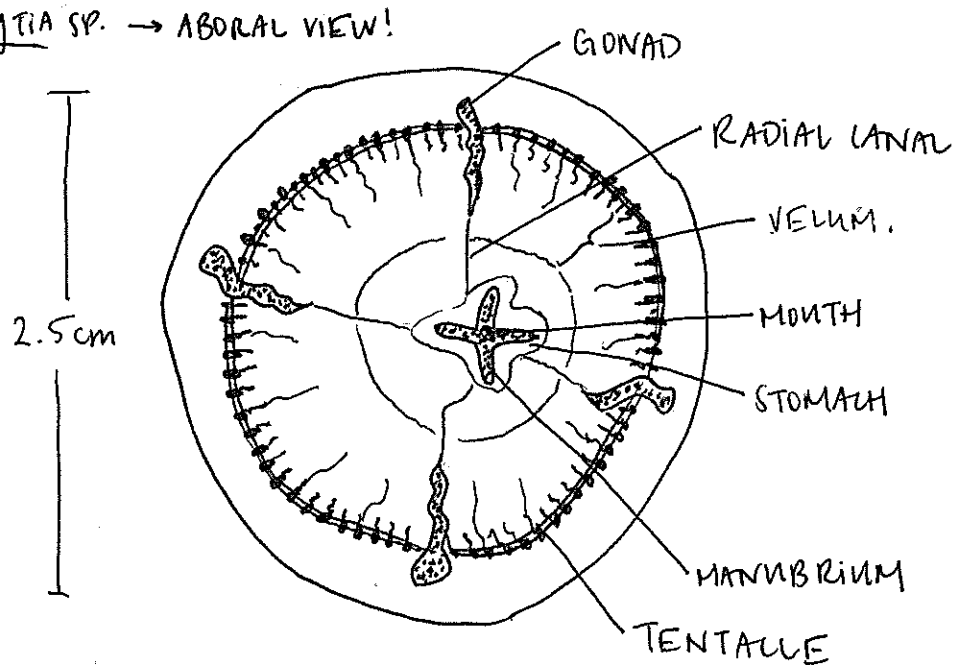
notes:

* zooids respond to touch by immediately retracting into theae, but once the tool of perturbance is removed, the polyp immediately extends back out
* up close, polyps + perisarc all appear clear, but from far away large colony looks golden-brown and feathery.
* seem to respond to light after long exposure by retracting into theae.

* function of structures: annulus are for flexibility; theca is for zooid protection; coenosarc for gastrovascular suppo

STRUCTURE (CONT.):

PHYLUM CNIDARIA
SUBPHYLUM MEDUSAZOA
CLASS: HYDROZOA
ORDER LEPTOMEDUSAE
CLYTIA SP. → ABORAL VIEW!



(II) SWIMMING BEHAVIOR OF CLYTIA:

* Though the physical circular muscles cannot be seen on the organism (which is not shocking, considering 90% of a jellyfish is mesoglea, 95% of which is water), the contraction of these muscles is obvious. In response, the velum moves distally to medially (contracts), forcing water out of the subumbrellar part of the organism (bell). In a diffusion without circular flow, this action results in the organism moving only a few centimeters. Once the longitudinal muscles contract and the circular muscles relax, water rushes back in, reinflating the bell so that another contraction of the velum can continue to propel it forward. Generally speaking, the action looks pulse-like.

(III) FEEDING BEHAVIOR: ADDED ARTEMIA TO CORYNE, TUBULARIA, OBELIA, + CLYTIA—

Observations: * ARTEMIA: in response to being fed to all organisms, the brine shrimp immediately started to swim toward the light source if they were not stung by the nematocytes of their predator. Many of them resisted being stung by some of the organisms to which they outsized considerably (eg. CORYNE + OBELIA). However, many of them were stung continuously, and were unable to squirm out of the grips of the predator.

* CORYNE: because the Artemia were larger than the tentacles, many got away—unless they fell directly onto the tips, where the nematocytes are concentrated. All the tentacles retracted on one another, presumably to pull the Artemia toward the mouth—but they retracted so far it became impossible to visualize.

* TUBULARIA: Has two sets of tentacles: one directly by its mouth, and others surrounding the rest of the gastrozooid. Both sets of tentacles could catch the brine shrimp. They passed it up to the more apical tentacles before folding over it and consuming it through its mouth.
* OBELIA: Again, since the gastrozooids were so small, many of them struggled with capturing Artemia unless they fell directly into the tentacle or were blown into the tentacle from the pipette. The reaction of moving the Artemia to their mouth was considerably slower than the other animals observed.
* CLYTIA: The jelly was seemingly overwhelmed with the amount of Artemia I gave it. All of its tentacles were saturated with them, and so too was the manubrium. The clytia took a long time to fully ingest any respectable amount of the Artemia; the digestion process, again, was very slow.

(IV) RELATIONSHIPS: PREDATORS, COMMENSALS, SYMBIONTS ON COLONIES

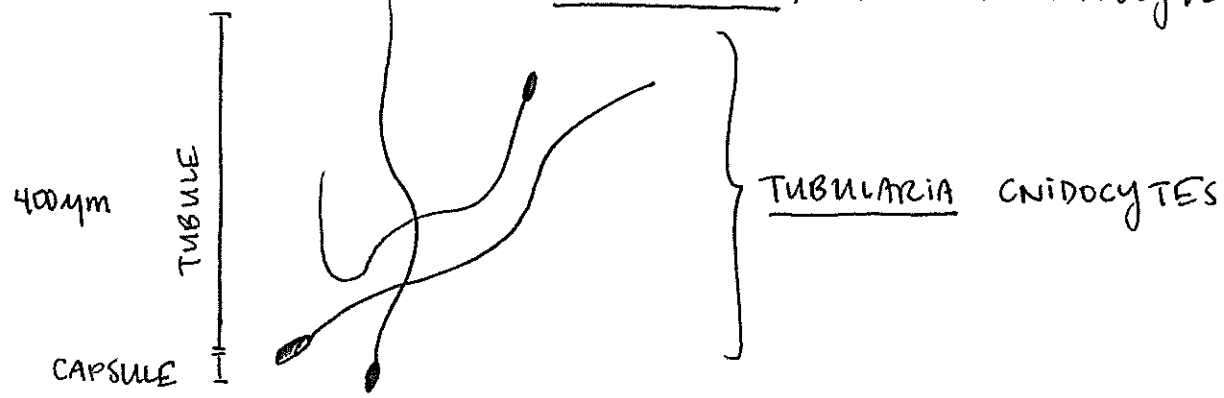
predators: * potentially flatworms! In the lab, questionably skeleton shrimp (but probably not; definitely not in the field)
* A quick google search indicates that nudibranchs are often predators of hydroids, though I did not directly observe this in the lab.

commensals: *Skeleton shrimp will use the stalks of the hydroids to perch and snatch food out of the water column
* Same for some polychaete species, it appears * several copepods are laying/brooding their young on the branches/stalks of the hydroids, too. * several types of algae growing on the stalks.

symbionts: * some hydroids have dinoflagellates as zooxanthellae, though I did not directly observe them in the lab.

(V) CNIDOCYTES:

* SEE LAB 01 SECTION 02 (ANTHOPLEURA) FOR MORE CNIDOCYTE DETAILS:

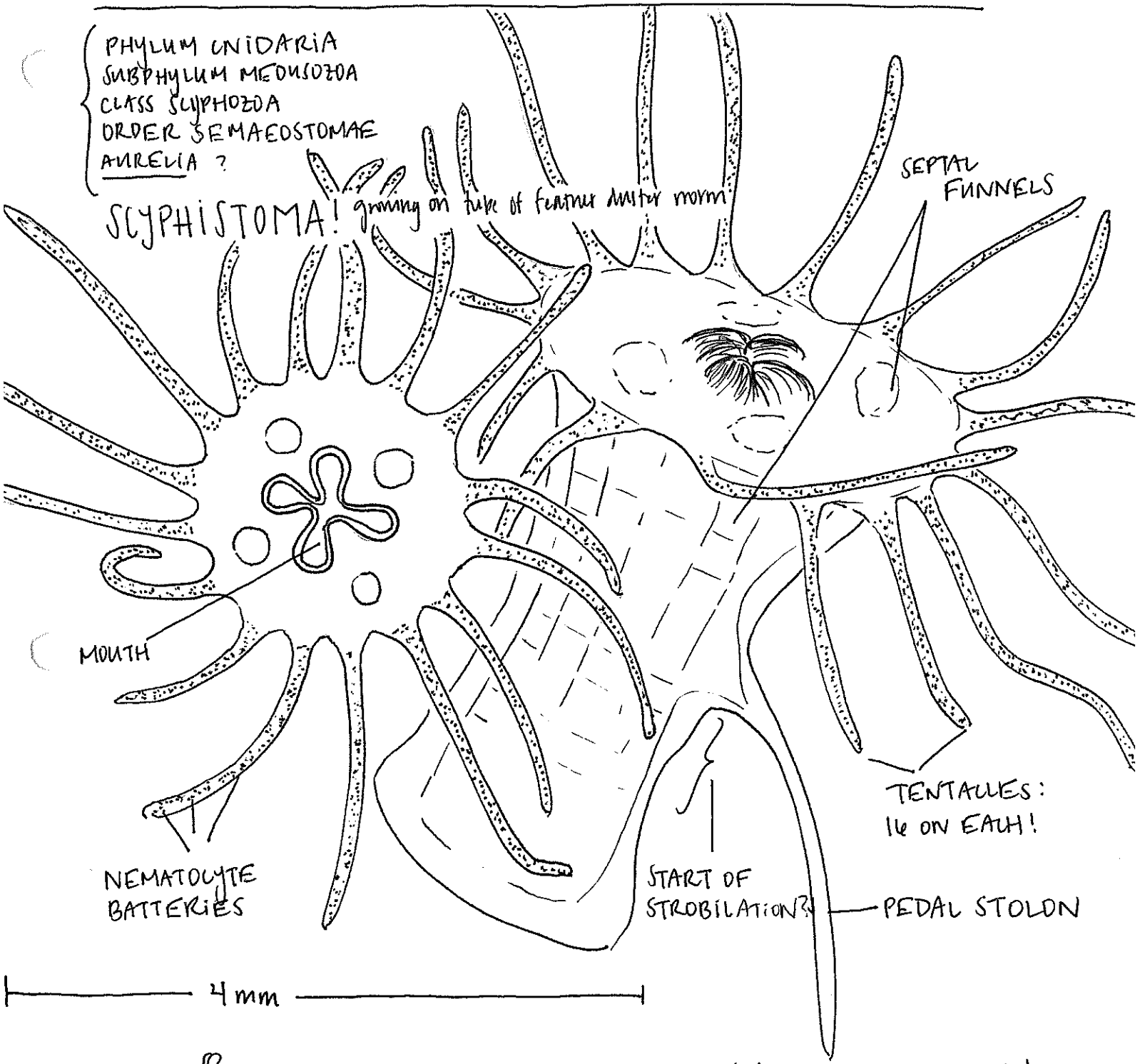


→ Relative to the Anthopleura cnidocytes, these are notably larger. And, the tubules are proportionally longer than the capsule, whereas in Anthopleura the sizes were more comparable (tubule = 2-3x length capsule)

PHYLUM CNIDARIA: CLASS SCYPHOZOA // 04.11.2017

PHYLUM CNIDARIA
SUBPHYLUM MEDUSOZOA
CLASS SCYPHOZOA
ORDER SEMAEOSTOMAE
AURELIA ?

SCYPHISTOMA! growing on tube of feather duster worm



notes:

* The specimens drawn were attached to the worm tubes. I did not see evidence of budding on these organisms, but I did see some buds in the dishes, in which detached scyphistomae were placed.
* some of the gastrovascular cavities have prolapsed out of the mouth of the worm surface.
* Are opaque, look white or off-white depending on the light direction.
* Septal funnels are for gas exchange and increased surface area