THE BOTTOM BUNCH

An Independent Dive Club

Newsletter Date
April 2003

Meeting every first Wednesday. Next meeting Wednesday, April 2nd, 2003
At La Bella's Pizza Gardens, 373 Third Ave, Chula Vista

This Months Meeting

6 PM Dinner and Social Hour

7 PM Guest Speaker

For our April meeting, our guest speaker will be Bottom Bunch members Jeff Hannigan and Faith Ortins. They will be sharing with us some of their dive stories and photographs from their trip to the Red Sea. Join us for an entertaining evening with some of Faiths wonderful stories and Jeff's incredible photography.

7:50 PM Blackbeard's Locker

This months Blackbeards will be a Dacor Classic regulator .

8 PM General Meeting

Meeting followed by door prizes.

Door prizes generously donated
By **Aqua Tech Dive Center**
619-237-1800
And the **Hydrodiver**
1-800-493-7634

Inside this issue:

Last Months Meeting and Announcements

Last Months Meeting

For our March meeting our guest speaker was Sergio Angelini PhD, the chief design engineer at Scubapro. He gave us an informative and technical talk on the testing and performance characteristics of regulators. Sergio's primary discussion centered on the current industries standards and beliefs on the maximum allowable pressure of the air flow coming from the primary regulator through the secondary regulator and into the lungs, (that feeling of being fed air from the regulator during inhalation.) Current air flow maximums are set at a level that is believed necessary to prevent lung over expansion. However, the data Sergio has been collecting, indicates that this pressure level maybe allowable at twice the current maximum levels. This would allow a higher volume of air to be supplied to the diver when conducting strenuous activity and facilitate easier breathing of the thicker air of deeper depths, particularly those depths beyond the current recreational dive limits. Thus reducing the possibility of over breathing the regulator, which could lead to carbon dioxide buildup in the blood stream, resulting in fatigue, panic, unconsciousness and beyond.

Other interesting data Sergio reported was the internal operating temperature of the primary regulator. During usage, the primary regulators temperature is approximately fifty degrees below the surrounding waters temperature. 70 degrees F becomes 20 degrees F, 50 degrees F becomes 0 degrees F, 30 degrees F becomes –20 degrees F. The freezing point of salt water is approximately 28 degrees F depending on the salinity levels. Thank you Sergio for an informative evening.

Announcements

For those going on the Bottom Bunches annual trip to Catalina and San Clemente Islands, **June 7th, 8th, 2003,** your payment is due in full by the April meeting. Available spots will be open for sale to the public after the April meeting.

Contact our Dive Coordinator, Wayne Austin, for further information. **619-524-5323.**

Bottom Bunch night dive and BBQ at La Jolla Shores, **April 25th, 7 PM**. Bring a dish and join your fellow club members for a wonderful evening around the fire on the beach at beautiful La Jolla Shores. The Club will provide the soft drinks, hotdogs and buns.

Dates To Remember

Bottom Bunch night dive and picnic at La Jolla Shores.
April 25th, 7 PM.

Northern Channel Islands.
May 24, 25, 26th, 2003.

Catalina and San Clemente Islands.
June 7th and 8th, 2003.

Santa Barbara, San Nicholas and San Clemente Islands.
September 26,27,28 2003

Reminder

Please check your mailing label for your Bottom Bunch membership renewal date.

The Bottom Bunch Website
www.bottombunchdiveclub.com

THE SANDS OF LA JOLLA

By Dr. Hans Bertsch
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In last month's newsletter, I discussed various principles of taxonomy, what alcyonarians are (gorgonians and their relatives), and the arminid nudibranch *Histiomena convolvula*, which occurs in the northern Sea of Cortés and eats gorgonians. This month let's use all that information and illustrate the life habits of a southern Californian nudibranch *Armina californica*. We will also make a leisurely perambulation with fins among the other creature features at La Jolla Shores!

Figure 1. The snail Hypermastus on the sand dollar Dendraster.

It was a typical day at the Shores. Parking was obnoxious, the local residents were surly, divers had gear spread on the sidewalks, the showers were non-functioning, and the change room was closed at "prime time" (8:30-9:30 am) for cleaning and maintenance by a rubber-booted team from SD park maintenance. Suddenly, the term La Jolla took on a new perspective. You've been there and tried to wriggle into your swimming suit inside the car so no one can see your white fenders exposed to the Gawking and then complaining Prudery Republic of the Beach Control. Well, I probably shouldn't exaggerate too much, because I have seen both the inconsiderate and the considerate. Bottom Bunch members know the difference, and I am proud of that.

So, the Sands of La Jolla—this is where many people have taken their check out dives, only to vow, "Nevermore, quoth the Certified." But here is where one can use all the kinds of skills I talked about last month to discover and record new and exciting information. I have published 2 scientific articles about snail and slug life that I found here.

Figure 2. The sea star Astropecten.

One of my articles (1994) reported on the natural history and ecology of an unnamed species of eulimid snail. This snail is tentatively named *Hypermastus* sp. The genus is known, but the

species is still to be determined and scientifically named. Its shell is small (4-8 mm in total length), turret-like, and glossy white. The animal is an ectoparasite on our local sand dollar *Dendraster excentricus* (see **Figure 1**)

Living *Dendraster* are set up like vertical poker chips in subtidal regions. They are usually present in large "beds," their flattened bodies oriented with the primary currents (opposite the position of gorgonians that face across the currents). Both feed on nutrients that the currents supply. Groups of *Dendraster*. Beds. Perhaps we need a new word here. Lots of species of animal groups are so distinguished, like a "covey of quail." So maybe a large bed of *Dendraster* should be called an "economy of sand dollars"!

The *Hypermastus* snail I have discussed lives attached to the exposed portion of *Dendraster excentricus*, and sticking its proboscis into the fleshy parts of its host, sucks out lunch. I have counted anywhere from 1 to 7 *Hypermastus* sp. snails on a single *Dendraster excentricus*. I have also seen this echinoderm-sucking snail on the aboral (that is, not on the mouth side) surface of the common spiny sand sea star *Astropecten armatus* (see **Figure 2** which illustrates this beast).

Figure 3. Diving buddy Tom Smith, behind a gorgonian.

My other scientific article about animals from La Jolla Shores was co-authored with Tom Smith (Figure 3 shows him behind a gorgonian at Bahía de los Ángeles). We reported new distributional records for three species of nudibranchs, including *Flabellina pricei.*

Figure 4. A portrait of the sea pansy, Renilla koellikeri.

More recently, in 1998, Ángel Valdés and David Behrens described the nudibranch species *Doriopsilla spaldingi* (with underwater color photographs provided by Michael Miller). This species is known from La Jolla Submarine Canyon, San Miguel Island (of the Santa Barbara Channel Islands) and south Coronado Island, Mexico.

Of special significance while describing the opisthobranch fauna of La Jolla Shores is the underwater photography of Steve Gardner, who as a mild-mannered member of the Bottom Bunch turns himself on weekend mornings into UW Bumblebee—

and returns from La Jolla Shores with exquisite photographs of nudibranchs and other invertebrates. You may appreciate Steve's work on a link through The Slug Site (under the site-mastership of Mike Miller). Call up the URL of www.slugsite.tierranet.com or www.slugsite.us . Once there, click gently on the Flag on the left hand side to begin scrolling down the list of multiple links. When you reach DIVE LA JOLLA SHORES WITH STEVE GARDNER you can access his photographs. Within his site is another link to an hourly updated image of La Jolla Shores—honest, a real photograph of what the surf looks like there! What a fantastic gift to us. When we are stuck at our desks on a 9-5 job, we can call up Steve's site (on company time—remember this is computer work) and see a picture of our favorite (well it will be soon) dive site. Surf's up—or down—and we lose a job while we head to the beach!

Fig. 5. The sands of time: the nudibranch-eating slug Navanax inermis and the alcyonarian-eating nudibranch Armina californica.

Please also call up The Slug Site, and looking under the left hand column again, call up the link titled "Past BOW selections in alphabetical order." Scroll through the listings and you can find further information on *Glossodoris tomsmithi*, *Flabellina pricei*, *Doriopsilla spaldingi,* and the animal I am now going to discuss: *Armina californica*.

Sand. Sand. Sand. Flat expanses of sand that eventually drop off into mudstone cliff faces and canyons. I am gently swimming above the economies of sand dollars so that I do not disturb their feeding positions by the hydraulic force of my fins, nor touch them with my hands or other body parts. Once past them, I return to my reptant behavior, crawling over the sandy benthos. Slowly. Over the sand. Dozens of animals become apparent to me, but I am focused on the alcyonarians (remember our taxonomy lesson in last month's Bottom Bunch Newsletter?). There, I see it, below me, is the circular purplish form of a *Renilla koellikeri* sea pansy (**Figure 4**). I don't touch it. I look. A gentle layer of sand dusts the purple surface. Of course, sticking downwards into the sand is its peduncle, a fleshy stalk by which it anchors itself into the sand. The visible, heart-shaped portion lies spread over the sandy surface. The whole animal

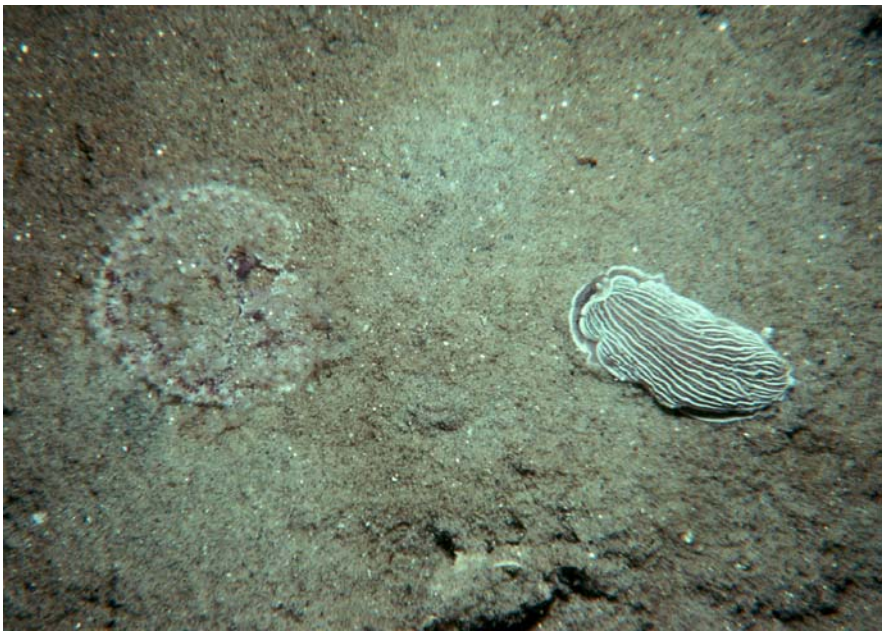

Figure 6. The predatory slug Armina californica approaching the sea pansy Renilla.

is a great example of evolutionary adaptation to the roilings and comings and goings of the surge in a sandy habitat. It stays hunkered close to the bottom, and flows with the sands. It lives well in its habitat, and stays in place, except when a diver (or other non-natural force) kicks them out by gross flipper actions or plucks out the *Renilla* because of crass ignorance. It is very hard for them to reanchor themselves, so the uprooting will often result in their being washed upside dead down into deeper water.

Figure 7. Armina almost ready to attack its prey.

Looking to my right, I saw the sea pansy predator *Armina* and the sea slug predator *Navanax inermis* (**Figure 5**). *Navanax* was not really on a collision feeding course, as it curled pathwise away. However, *Armina* was another matter. It was hungry. I put my camera and underwater writing slate into position to record what would happen next. Relentlessly rushing its way through the sand, *Armina*'s rhinophores have sensed food (**Figure 6**). Oh, by the way, rhinophore is just the technical name for the antennae or chemosensory apparatus of nudibranchs.

Figure 8. LUNCH!

FOOD. It is almost there (**Figure 7**). It plops on top of its prey, and uses its radula (again, see my article in last month's Bottom Bunch Newsletter) to scrape and scratch polyps and tissue into its digestive system. The California *Armina* can grow to 70 mm (nearly 3 inches) in total lenght. It has been reported from the Gulf of Alaska to Panama. Alternating pinkish-brown and white stripes run lengthwise down the animal's body. As you recall from our discussion last month on *Histiomena convolvula*, its gills are along the sides of the body, above the foot.

By now you know my writing style, so sure enough, here is another aside. Did you know that the sea pansy *Renilla koellikeri* glows in the dark? Here is the protocol: Do a night dive with your lights turned off. When you see a *Renilla*, very, very gently touch it. [YOU ARE SAYING, "BERTSCH, HOW CAN I DO A NIGHT DIVE LIGHTLESS AND SEE THIS ANIMAL FLATTENED ON THE SAND?" To which I respond, well you need to. If you want to see the marvelous glow.] Light inhibits the production of the glowing chemical, so you must approach it darkfully. Decades ago I published my first scientific article on the predator/prey relationship between *Armina* and *Renilla*. When *Armina* bites, *Renilla*

glows. Painfully, soundlessly screaming out! What did *Armina* do in response to this defensive outburst? Nothing. *Armina* is blind. So why has *Renilla* evolved glow-in-the-dark facilities? Probably other nocturnal predators with visual acuity are more common in their habitat, and eat more *Renilla*. Our sea slug *Armina* is just a temporary nuisance, that has not contributed enough predation for other defensive mechanisms to evolve.

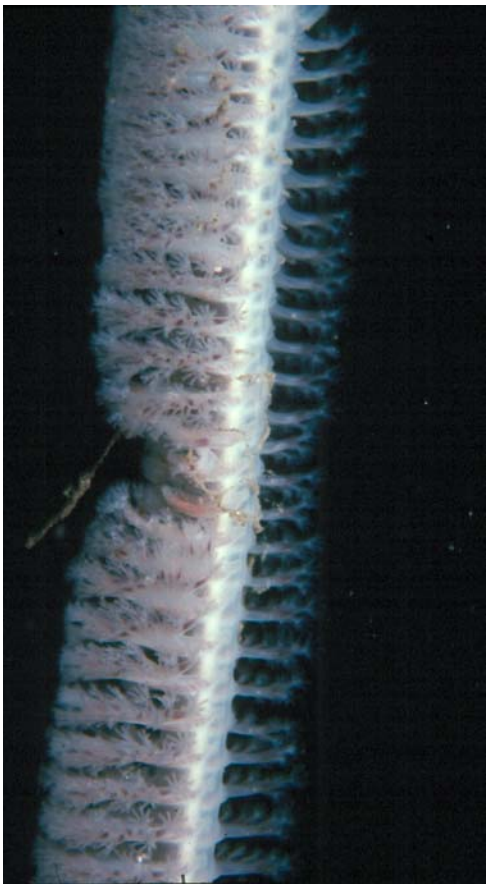

Figure 9. Close-up of the polyps and structure of the alcyonarian Stylatula elongata.

Armina has globbed onto *Renilla* and is eating (**Figure 8**). Gently I kick my 25 year old black AquaLung US Divers fins (none of this pseudo-modern-split-fin nonsense for me, the Buzo Clásico) and I move across the sand surface.

There it is. A sea pen, *Stylatula elongata* (**Figure 9**) protruding out of the sand. These marvelous alcyonarians have their 8 pinnate polyps on horizontal rows protruding from the side of the vertical upright shaft. This can be seen fairly well in Figure 9. As I keep swimming, I see another *Stylatula*, and coming in from the side, an *Armina* (**Figure 10**). The slug smells its prey, chemically speaking. Approaches. And finally, very slowly gets close enough to take a bite out of the *Stylatula* (**Figure 11**). Once, I watched *Armina* chomp a *Stylatula*—but only one chomp was allowed, as the *Stylatula* quickly retracted itself back into the sand. The poor slug was left foodless—well, at least it had a mouthful. Sort of like our monthly meetings—they deliver the pizza, you bite off a hunk of pepperoni&salami, the meeting ends, and that is all you get. Remember when you are underwater and see a *Stylatula* do not touch it. Touching sea pens can cause them to become oversensitized to touch, and not retract defensively when they should. They become acclimated to external stimuli and do not properly protect themselves.

Figure 10. Armina "smells" Stylatula.

Back to the *Stylatula* sitting comfortably in 50 feet of water at the shores. It is spread happily into the currents, feeding on the plankton that its polyps can gather. It is oblivious to the fact that the rhinophores of *Armina californica* have picked up its scent. Ahhh, to eat only by smell—that is the life of a nudibranch. It was one of those exquisite "Natural History Moments," you know, the type that are on Discovery Channel. In front of me I saw *Armina californica* actually sitting on its prey (**Figure 12**).

Figure 11. Getting closer for the bite!

Is there a moral here? Of course. Sand diving is rewarded by patience, respecting the habitat and evolutionary adaptations of the animals you encounter. Please be gentle to them, and bring back your memories to share with all of us. Sand diving. Just because you may have been taught there does not mean you should not return. Returning enhances your skills and perceptions, and gives you incredible rewards. Ask Steve Gardner. Mike Miller. Tom Smith. Me. Go slow over the sand. You will see and be able to photograph an incredible diversity of different "rooting" or "hunkered down" species. That is the glory of diving—to see what you never thought you could see.

Hans Bertsch

Figure 12. Armina sitting on the Stylatula, which has retracted its polyps.

By the way, here are some further reading suggestions mentioned in the text or that will help identify organisms:

Behrens, David W. 1991. Pacific Coast Nudibranchs, second edition. Sea Challengers, Monterey.

Bertsch, Hans. 1968. Effects of feeding by *Armina californica* on the bioluminescence of *Renilla koellikeri*. The Veliger 10 (4): 440-441.

Bertsch, Hans. 1994. San Diego's unnamed species of *Hypermastus*. The Festivus 26 (11): 129-131.

Bertsch, Hans, and Tom Smith. 1983. Range extensions of three opisthobranch mollusks to the San Diego-La Jolla (California) ecological reserve. The Veliger 26 (1): 69-70.

Gotshall, Daniel W. 1994. Guide to marine invertebrates: Alaska to Baja California. Sea Challengers, Monterey.

Valdés, Ángel, and David W. Behrens. 1998. A new species of *Doriopsilla* (Mollusca, Nudibranchia, Dendrodorididae) from the Pacific coast of North America. Proc. Calif. Acad. of Sciences 50 (13): 307-314.

Also, be sure to check out Mike Miller's Slug Site:
www.slugsite.tierranet.com

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Membership and renewal information.

Individual – First time initial $24 then $15 per year for renewal there after.

Family – First time initial $24 for the first member, then $12 for each additional member, then $15 for the first member and $7.50 for each additional members for renewal there after.

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619-424-6445