Opisthobranch Newsletter

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http://www.seaslug.com.

EDITOR'S NOTES

The first issue of the year 2000. The seaslug website is undergoing some major modifications to make more information available. I'm moving the files over from Oz.net to HGS.net so that Mark Rushing can work on the search engine more easily. At some point seaslug.com will move over to the new site and may not link quickly. If you have trouble, try http://www.hgs.net/~seaslug which is up and running already [January 8, 2000].

I have listed below the abstracts from the 2nd International Workshop of Malcology, Menfi, June 10-14, 1999. I hesitate to include them with the regular citations since I do not know where they are "published" and available permanently. For the present they are still available by link from seaslug.com. Anyone with ideas on this?

PERSONAL NOTES

Michael Behrens is off to University of California at Santa Barbara to pursue PhD studies. No new address yet.

Dave Behrens is so busy with his job that Diana is having a busy time keeping up with Sea Challengers.

INFORMATION REQUESTS

From Gonçalo Calado: I'm a PhD student in Santiago de Compostela working with the nudibranch *Calma glaucoides*. I'm trying to find out where the types from Salvatore Trinchese are stored. I'm particularly interested in *Forestia mirabilis* (synonymized with *Calma glaucoides*). Do you know as well if the type from *Calma glaucoides* (Alder & Hancock) is kept in the Hancock Museum? - rakas@mail.telepac.pt

From Sérgio Ávila: [Jan.99] I'm looking for published data on opisthobranch species occurring in the Azores (middle Atlantic Ocean). – avial@uac.pt

From Marien Faber: [Jan.99] I am looking for a description/drawing/photo of the radula of *Acteon* (or *Rictaxis*) *punctostriatus* (C.B. Adams). The real one, that is (from the northeastern Atlantic; not from the Caribbean of Brazil). If possible in connection with a figure of the shell of the same specimen. I would be very grateful if someone could point me to the right publication, or perhaps share some unpublished research. – mjfaber@wxs.nl

FIELD NOTES

From Mark Mahan: On a nudibranch note: I made a discovery about a month ago – *Chromodoris macfarlandi* eats *Aplysilla glacialis* (the Keratose Sponge from Abbott and Haderlie). I found two *Chromodoris* in one afternoon at White's Point [Los Angeles, California]. One appeared to be eating something. I took the nudibranch home with some *Aplysilla* to confirm it and it ate all I brought over the next couple of weeks. I have not seen this reported previously. These nudibranch's even have (and now I can see it quite easily) a tinge of the sponge's pink coloration. Other sponges have been mentioned in literature as food, but I have never seen them eat anything before and consequently was never able to keep them in an aquarium for very long. - MARKMCMAHA@aol.com

From Anthony Holley: Sipadan is a famous little island of the east coast of Sabah, north Borneo, Malaysia's only oceaninc island it rises straight up from 2000 ft., yet takes less than thirty minutes to walk around! Fabulous diving and nothing else. Turtles everywhere, plus big schools of jacks and barracuda.

Last July [1998] there were fewer nudibranchs than in previous years, but I still keep on finding *Notodoris serenae.* I first snapped it ten years ago in the area and couldn't identify it, so was pleased it was finally named last years. – anthony.holley@virgin.net

GLOSSARY

Adaptive radiation: When a single species exploits a diverse habitat and subsequently speciates into several new species. The most commonly cited examples are the finches of the Galapagos Islands. Presumably a single South American finch made it to the Galapagos. Being the only land bird, quickly speciated into the divergent forms seen today. While island examples are the most obvious, there is not a species alive that is not the product of adaptive radiation. As I stated above, all species in existence are the product of adaptive radiation. For specific examples of "Finch-like" cases, I am sure that there are many other Conch-Lers out there who could cite thousands of island pulmonate examples alone. - Aaron Baldwin, jsapb@gci.net

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Batesian mimicry: Two species display a similar color pattern, however only one is toxic and the other perfectly edible. A classic example is the Monarch butterfly (toxic) and the nearly identical Viceroy butterfly (edible). As above, the Monarch's red and black coloration is a warning of toxicity. The perfectly edible Viceroy looks so much like a Monarch that predators will avoid it. Batesian mimicry is far more widespread amoungst mollusks. There are many pulmonates that mimic bird feces and thus appear unpalatable to birds. I don't know this for a fact, but I suspect the striking coloration of the mantle (and shell) of Cypraeids is meant to fein toxicity (if not to specifically look like toxic nudibranchs, sponges, etc). One finds Batesian mimicry to usually be the case when a very edible species advertises itself with bright colors. Some species are opportunistic and seem to live around toxic species (that they resemble probably by coincidence rather than design) when possible. An example is our local *Siphonaria (Liriola?) theristes*. Around Juneau you can find dense populations in colonies of the toxic sea cucumber *Cucumeria vegae*. To find them I run my fingers over a mat of the cucumbers until I feel a shell (they look almost identical when out of the water). In other areas I have found the *Siphonaria* where there are no cucumbers. The similarity is undoubtedly just a fortunate accident. - Aaron Baldwin, jsapb@gci.net

Character displacement: Generally this is when two populations of the same species occupy the same environment and compete for resources. Character displacement occurs when one population modifies its behavior (and physiology) so that it no longer competes with the other. This is known as "resource partitioning" and is one major step in adaptive radiation. A great example can be found here in Alaska with our resident and transient pods of Orca (Killer) whales. Both populations share the same habitat, but one population feeds almost exclusively on salmon while the other population feeds only on other sea mammals. Character displacement also occurs when you find resource partitioning between age classes of the same population. Finding good examples of character displacement in mollusks is outside of my knowledge base. The one good example I can think of are juveniles of *Tectura scutum* and *Margarites beringensis*. Both species (as adults) are mid to low intertidal (at least in SE Alaska). However, the juveniles of both are abundant in the high intertidal Fucus zone. This is resource partitioning at its finest. It is counterproductive for an adult to outcomptete its own offspring. By living in different zone on the same beach, the age classes avoid intraspecific competition. - Aaron Baldwin, jsapb@gci.net

Co-evolution: When two species each become the other's primary ecological adaptive influence. All species in a particular ecosysytem are co-evolved, but striking examples can be found in commensal species. Some species have co-evolved to such a degree that both would die without the other. Co-evolution is an on-going process in any ecosystem. *Tridacna* clams feed off of particular species of dinoflagellate algaes (Zoothanthellae) that live within their tissues. Without the dinos, the clam dies, without the clam, the algae dies. Both have co-evolved to such a degree as to have created an obligate mutulaism. Many bivalves are commensal in burrows of various crustacea. Many of these crustacea are generalistic predators, yet somehow the bivalves have co-evolved with the crustacean (probably by offering something in return?) as to live relatively peacefully. Other great examples can be seen in predator/prey relationships. Nudibranchs often feed on very toxic organisms. While the nudibranch (predator) has evolved means of metabolising and even using these toxins, the prey is also evolving ways to survive such as new variations of toxins. Ewe are now discovering that many sessile organisms are equipped with an enormous and complicated battery of new compounds that rival those found in the tropical jungles. - Aaron Baldwin, jsapb@gci.net

Convergent evolution: Two species that display similar traits not because of relatedness but because of similar ecological demands (analogous traits). The pectoral fins of fish and the flippers of whales are similar in shape because that is an optimal shape for aquatic locomotion, not because of a specific relatedness (whales are closer to bats, hedgehogs, cows and humans than to any fish). The opposite of an analogous trait is a homologous or derived (from a common ancestor) trait. I believe that no other area of evolution has caused more confusion than this important distinction. A discussion about convergent evolution in mollusks could open a whole can of worms (or Solenogasters?). As I stated above, no other area of evolutionary biology is more misunderstood or subject to heated debate. Convergence is obvious when talking of whale flippers and fish fins or bird wings and bat wings. The distinctions become more blurred when dealing with more closely related species. The Atlantic vs Pacific mollusks are an excellent example. There are many species on the Pacific that have a "sister" species in the Atlantic. This is probably due to the fact that the ancestor of both crossed over when Panama was a natural canal between the two oceans. In this case the similarities between two species are due to derived characteristics. The other possibility is that both species independantly evolved similar traits because both exploit a similar habitat (or similar environmental pressures). I am sure that both scenarios occured. Commonly, organisms we see today are a blend of derived and convergent traits. For example, most Murcidea have spines and/or varices. So it would be pointless to discuss convergence the spines of Murex pecten and Chicoreus ramosus. Both have spines because both evolved from a spiny ancestor. However, let's take the varices of a Typhis and the varices of Ceratostoma. Do the varices imply a common ancestor WITH varices, or did both evolve from a spiny murcid ancestor and subsequently evolve varices as an adaptation to their environment? The tendency for spinyness is derived, the varices may be convergent. (Lest I be flamed for fatal flaws in my murcid evolutionary history, I was merely stating a "for instance", not expressing any specific knowledge of Murcidea phylogeny). - Aaron Baldwin, jsapb@gci.net

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Impact factor: is calculated by ISI [Institute for Scientific Information, the Philadelphia-based company that makes Current Contents and produces several scientometric indices] as follows: Let's suppose that Malacologia has published (a) articles in 1995; in the same year, articles_ published in Malacologia are cited (x) times in journals covered by ISI (= more or less those indexed in Current Contents) Let's now suppose that Malacologia has published (b) articles in 1996; in the same year, articles published in Malacologia are cited (y) times, of which (yl) are citations of articles (a) published the year before and (y2) are citations of articles published before 1995. Finally let's suppose that Malacologia has published (c) articles in 1997; in the same year, articles published in Malacologia are cited (z) times, of which ttl) are citations of articles (a) or (b) published in 1995 and 1996 and (22) are citations of articles published before 1995. The impact factor of Malacologia in 1997 is how many times articles published in that journal in 1995 and 1996 have been cited in 1997 in any journal covered by ISI divided by how many articles were published in 1995 and 1996. In other words: ttl) divided by (a)+(b) The impact factor of a journal is revised annually. Because an important paper is more cited than an unimportant paper, the impact factor supposedly measures the "relevance" of science published in a journal to the advancement of knowledge and ideas in general. However, the impact factor measures only how many times a paper is cited in the 2 years following its publi_cation. This may do well in branches of science such as semi-conductors or AIDS, but it is utterly inappropriate in descriptive disciplines such as ours, where a paper is often cited 20-30 years or more after it has been published. Yet it is this impact factor that is used by science administrators (at least all over Europe) to "measure" the productivity of scientists. Also, increasingly, librarians use it to decide which journals they will subscribe or unsubscribe to (hence the often stiff subscription prices of journals with high impact factors!). Geosciences journals commonly have impact factors of 1-4, biomedical journals range up to 20 or more. With an impact factor of 0.5 or less, malacological journals run the risk of loosing attractiveness to young untenured scientists. – Philippe Bouchet, bouchet@cimrs1.mnhn.fr

Mullerian mimicry: Two seperate species that display a similar color pattern because both are toxic. A classic example is the Milkweed bug and the Monarch butterfly. Both species are toxic, and both are red and black. Let's say the Monarch evolved first. Birds eat the monarch, get sick, and never touch another red and black bug again. A Milkweed bug with similar patterns could benefit from the Monarch's sacrifice. Remember, it's useless (for your genetic success) to be toxic if a predator has to eat you to figure out that you're toxic. The most obvious example of molluscan Mullerian mimicry can be found in the nudibranchs. Those striking patterns have the same meaning worldwide ("I'm toxic or taste bad") I am not an expert on this group, but I am sure others can name many divergent nudibranchs that display similar color patterns. I don't know if the striking patterns on certain cone shells are unique warning colors or follow the scheme of other toxic species There are theories that state that at least some warning colors and/or patterns are somewhat "hardwired" into animal species. That is, at some point in the distant past, some toxic animal set the standard that red, yellow, and black (for example) mean's "deadly" whether you're a nudibranch, polyclad, or snake. The relative rarity of Mullerian mimicry in molluscs is probably due to the fact that they are (as a whole) non-toxic. - Aaron Baldwin, jsapb@gci.net

2nd International Workshop of Malcology, Menfi, June 10-14, 1999.

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