

Opisthobranch Newsletter

June, 1997, 23(6):21

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EDITOR'S NOTES

This is exciting! We took the next step into the 21st century with the startup of the **seaslug list-server** in late May. Many of you do have e-mail but do NOT have full internet access. With seaslug@oz.net you will be able to send and receive notes and news to and from a much larger group of branchers. At the same time we will make more information available to ON subscribers.

To subscribe, send an e-mail to majordomo@oz.net and put (only!) the following information in the text area: subscribe seaslug your-email-address (e.g., miranda@oz.net).

Whether you subscribe or not, please send me your snailmail address with any communication so that I can include addresses with notes published in the ON. I appreciate hardcopy for submissions to the ON -- even when I have the electronic version. Line drawings work well but photos do not duplicate clearly.

I have put the May ON on the Web as well as back issues from January, 1996. One of my long-term (very long-term) goals is to put all of the citations from the back volumes into the search files for the search engine.

Thanks to Bob Bolland for a donation to provide hardcopy subscriptions to three researchers.

Kathe Jensen has an e-mail, according to Kerry Clark KRJensen@ZMUC.KU.DK

Sandra Millen traveled to Las Vegas for her daughter Janna's (*Adalaria jannae*) wedding in May. Sandra & Sven were in Seattle over the 17th & 18th of May.

Pat LaFollette made it to Belize and got an e-mail through to me here. Repairing vehicle and getting ready to go upriver. I think Pat is due back on June 6.

Alan Grant dentadiv@fia.net got help from Dave Behrens identifying about 18 video clips of his most recent work.

PERSONAL NOTES

From Dave Behrens: Just returned from two weeks in the Philippines. Branchers Terry Gosliner, Gary Williams, Clay Carlson, Mike Miller and I collected some 212 species, several new to the Philippine Islands, and several undescribed species. Our collections were in the Batangas region of Luzon, Mactan Island, Cebu and Cabilao Island, Bohol. A trip report will be posted on the Slug Site, and a number of the species collected and photographed will appear as "Branch's of the Week" on that site. Terry and I are working up five of the new chromodorids presently. - PG&E, 2303 Camino Ramon, Ste 200, San Ramon, CA94583

From Paul Monfils: One aspect of this fluorescence thing that I didn't appreciate at first is that some shells apparently emit fluorescence in the same color range as their normal daylight coloration. While I was looking at some species of Limidae under UV, some fluoresced yellow or greenish, but

Lima lima "just looked white". That didn't strike me as significant at first, because I'm used to *Lima lima* looking white. It wasn't until thinking about it later (actually while I was falling asleep one night) that I realized something can't look white under UV except by fluorescence. If a white object doesn't fluoresce, then it can only reflect the dim violet light, and should therefore look dim violet. So I went back and took another look at a number of white shells. Sure enough, most of them (*Ovula ovum*, *Murex alabaster*, *Spondylus imperialis*, *Anadara species*, *Latiaxis species*, white Pectens, and albinos of several species) just appeared dull violet. But a few species, like *Lima lima* and species of *Alys*, appeared bright white, just as they do in daylight. - P.O. Box 6183, Providence, RI 02940

From: Paul Monfils: The dye Trypan Blue is widely used in medical and research settings for separating live cells from dead ones microscopically. Live cells actively exclude the dye, while it diffuses readily into the cytoplasm of dead cells. I don't know whether this technique would be applicable to snail ova.

Trypan Blue is available from a number of chemical companies and scientific/medical supply houses. You could probably get a small amount from someone who works in a hospital hematology or cytology laboratory. The color index number of the dye is 23850. Like most common dyes, it has a number of manufacturer-specific names, but the CI number will ensure that you are getting the right compound. Manufacturer names include: Direct Blue 14, Chlorazol Blue 3B, Benzo Blue 3B, Dianil Blue H3G, Congo Blue 3B, Naphthamine Blue 3BX, Benzamine Blue 3B, Azidine Blue 3B, Niagara Blue 3B, Diamine Blue 3B
- P.O. Box 6183, Providence, RI 02940

From Sheryl Quinn Hello. I'm a returning undergrad at UCSB. I studied nudibranchs for a couple of quarters at UCSC a few years ago. I am interested in learning more about them. I am looking forward to receiving a copy of your newsletter. - seaslug@aol.com

READER FORUM

Predation by a Nudibranch *Dendronotus robustus* from the Sea of Japan on Oweniid Polychaetes.
by I.S. Roginskaya

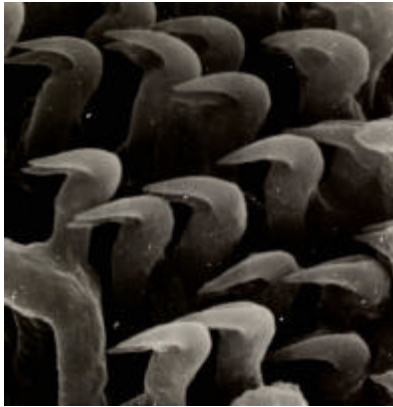
Major food resources of dendronotid nudibranchs are known to be various species of hydroids and coelenterates. Annelids in the diet of *Dendronotus robustus* Verrill, 1870 were first observed by G. Robilliard (1972) who found sabellid polychaetes in the pharynx and stomach of two specimens of *D. robustus* from Norway. The three specimens of *D. robustus* from Massachusetts, examined by Robilliard, apparently preyed upon hydroids.

Qualitative analysis of stomach contents of 12 adult specimens of preserved *D. robustus* body lengths 13.0 to 21.3mm, dredged in July, 1974 from 10 to 21m depths in the Dvinsky Bay, White Sea, confirmed annelid predation in this species (Roginskaya, 1990a, b). Numerous fragments of oweniid polychaetes, swallowed together with their tubes, formed the most important dietary component of 10 (from the 12) specimens examined. In a single specimen of *D. robustus* the stomach was filled, in addition to oweniid fragments, with land beetle remains. These had probably submerged after death and been captured by *D. robustus* during indiscriminate scanning of the bottom (Roginskaya, 1990b).

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Subsequently, oweniid fragments from the stomach contents of *D. robustus* were diagnosed, according to the revision of Nilsen and Holthe (1985), as belonging to *Myriochele oculata* Zaks, 1922. Identification was mainly based on the characteristics of neuropodial bidentate hooks (examined by scanning electron microscopy): uncini teeth arranged nearly side by side, but markedly asymmetrically placed (Nilsen and Holthe, 1985). Examination of swallowed tube remains revealed characteristic *Myriochele*-type transverse patterns of encrustation.



Myriochele oculata uncini from the stomach of *Dendronotus robustus* of the Sea of Japan 1cm = 2 μ

In contrast to the results on *D. robustus* from Dvinsky Bay, the stomach of a single large specimen of *D. robustus* (body length 90mm preserved), which had been obtained by dredging in Kandalaksha Bay of the White Sea in July 1975 from 125m depth, contained nematocyst-bearing soft tissue of coelenterate origin (identity not established, probably an actinarian) (Roginskaya, 1980).

In order to get the additional information on the feeding of *D. robustus* from different localities inhabited by this species, widespread over the northern parts of both Atlantic and Pacific Oceans and in the Arctic seas, the gut contents of three specimens from two different seas were examined.

(1) Two animals were obtained by the author in the course of 59th cruise of r/v Vityaz in the Sea of Japan, at 42°16', 1 N, 131°03', 4 E, from 250m depth, station 7457, May 27, 1976. Body length preserved: 32.3mm and 37.5mm.

(2) A single specimen from Western Spitzbergen, Greenfjord (40mm long preserved) was collected July 3, 1989, from 4-10m depth by Dr. V.O. Mokyevsky.

The food composition of *D. robustus* from these two localities differed significantly. Whereas both specimens from the Sea of Japan, similar to *D. robustus* from Dvinsky Bay of the White Sea, proved to prey on oweniid polychaetes, camanulariid hydroid remains were the only prey item discovered in the stomach contents of the animal from West Spitzbergen.

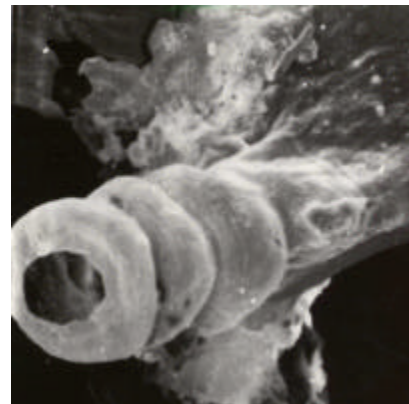
The stomachs of the two specimens from the Sea of Japan were packed with interwoven large fragments of oweniids. Some polychaete remains were as long as 10-13mm. Based on the characteristic bidentate neuropodial hooks, arranged in multiple transversal rows on each side of the body (Nilsen and Holthe, 1985), most probably *D. robustus* from the Sea of Japan preys on *Myriochele oculata*. The white flakes of amorphous material in the

alimentary tract of both specimens enclosed abundant clusters of diatoms, centric (mainly *Chatoceros*) and pennate, cysts and sand grains.

The swollen stomach and rectal part of the gut of the animal from West Spitzbergen contained numerous fragments of perisarcs of campanulariid hydroids, attaining up to 5.5mm long, enclosed in large volume of silty substance with clay particles, mixed with semidigested indeterminate white clumps apparently of animal origin. The SEM analysis discovered in these amorphous clumps numerous crushed fragments of diatoms and intact frustules, crystals, scales and a lot of clay, especially in the rectal part of the gut. Clay particles often filled the internal part of perisarc remains and there was a complete absence of nematocysts!

First observations on the feeding of *D. robustus* from the Sea of Japan on oweniid polychaetes give evidence of the fact that the relation between *D. robustus* and Oweniidae is more than random.

Sedentary Oweniidae are known to occur in large numbers (Nilsen and Holthe, 1985). *Myriochele oculata* are usually found in large aggregations, especially in the White Sea, where they are tangled, forming real balls (Derjugin, 1928, p.245). This fact obviously intensifies chemical signals from *M. oculata* and facilitates the process of prey detection by *D. robustus*, which cannot detect prey visually and needs to locate it by chemoreception, contact or distant.



Hydroid remain from the gut of *Dendronotus robustus* from West Spitzbergen x300 1cm = 33.3μ

It seems to me, that after being attracted by some tasty smell (for instance, from the community of *M. oculata*) *D. robustus* starts the scanning movement on the substrate, manipulating its enormous veil, engulfing anything it comes across with the help of strong jaws and radula, like a snow-removal machine.

This mode of prey capture may explain the abundant sand grains, clay particles, diatoms, crystals, hydroid remains, chitinous fragments of beetles and other indigestible debris in the alimentary tracts of most *D. robustus*. The absence of nematocysts in the stomach contents of the specimen of *D. robustus* from West Spitzbergen can also indicate, that all hydroid remains were swallowed accidentally, together with the main food item, stirred up by the moving mollusc from the upper layer of sediment.

Unfortunately all the samples examined were limited to the two summer months: June and July. So, for the present only the summer polychaete predation by *D. robustus* can be asserted. Additional study is needed to determine whether a seasonal change in dietary components and

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feeding behavior of *D. robustus* may exist. Also, the question whether *D. robustus* is preying on live *M. oculata*, or whether its mode of feeding is scavenging, is left open. - PP Shirshov Inst. Oceano., Russian Academy Sciences, 23; Krasikova St, Moscow 117218, Russia



Hydroid remain from the stomach of *Dendronotus robustus* from West Spitzbergen x300 1cm = 33.3µ

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Phyllidiidae found on Okinawa. - by Robert Bolland

The following is the listing of Phyllidiidae found here on Okinawa that I've found to date. The identifications have been kindly furnished by David Brunckhorst - the identifications were based on his examination of digitized slides sent via e-mail.

Phyllidia polkadotsa has a question mark as David writes that he has never seen specimens with so much white, usually the dorsum is bright yellow-orange with black spots. The scanned slides from three separate individuals could possibly be a color variation.

If you have access to the Internet, please see a scanned photo of *Phyllidia polkadotsa* at:

<http://www.imicom.or.jp/~bolland/phyllpolk.html>

Brunckhorst (1993. The systematics and phylogeny of phyllidiid nudibranchs (Doridoidea). Records of the

Australian Museum, supplement 16: 1-107) recognizes 6 genera and 49 valid Indo-Pacific species. Okinawa carries all six genera and 17 described species of the family and therefore Okinawa has claim to a rich assortment of phyllidiids. *Phyllidia* spp. are very commonplace and frequently seen while on SCUBA; it would be very unusual for me not to see at least 2 species of *Phyllidia* while on any SCUBA excursion here.

Okinawa Species Of Phyllidiid Nudibranchs (as of May, 1997): *Ceratophyllidia* spp., *Fryeria menindie*, *Phyllidia babai*, *Phyllidia coelestis*, *Phyllidia elegans*, *Phyllidia ocellata*, *Phyllidia polkadotsa?*, *Phyllidia varicosa*, *Phyllidia willani*, *Phyllidia* spp., *Phyllidiella pustulosa*, *Phyllidiella rudmani*, *Phyllidiopsis annae*, *Phyllidiopsis cardinalis*, *Phyllidiopsis pipeki*, *Phyllidiopsis sphingis*, *Phyllidiopsis striata*, *Phyllidiopsis* spp., *Reticulidia fungia*, *Reticulidia halgerda*. Univ. Maryland, Asian Division, Okinawa, PSC 80, Box 14149, APO AP96367-4149

Parasitoid Nudibranchs: For my thesis work, I have developed a model which classifies trophic strategies in a unique way. Now, I don't want to bore you with the details of my work, but in reviewing the literature I came across some very interesting little nudibranchs which exhibit a peculiar life strategy. These holoplanktonic nudibranchs (*Phyllirhoe* sp. and *Cephalopyge* sp.) are small as juveniles, and latch onto a larger jellyfish. They then methodically begin to consume the entire host and grow until there is nothing left of the jellyfish. At this time, the nudibranch matures and begins a free-living adult stage in the pelagic environment. The interesting thing for my work is that while this strategy is uncommon in the mollusks, it is VERY common in the insects (that is, the adult is free living, and the juvenile exists as a parasite and the host always dies). We entomologists call this type of animal a "parasitoid". It was refreshing for me to see that this life style is exhibited by non-insects. - Department of Entomology Office, Oregon State University, Corvallis, OR 97331-2907

REQUESTS

From Dr. Juan Lucas Cervera Currado: Could someone tell me if there exist some study about the larvae and the development in some *Roboastra* species (Nudibranchia, Doridacea, Polycerataidae). - Dept. Biología Animal, Vegetal y Ecología, Facultad de Ciencias del Mar, Universidad de Cadiz, Pol. Rio San Pedro s/n, Apdo. 40, 11510 Puerto Real (Cadiz), SPAIN

From Jon Sloan: A question for the slug folks. Concerning nudibranchs - what are the, in adults, effects of torsion and to what extent are they de-torted? - Paleontology/Marine Biology, California State University, Northridge, CA 91330

ANNOUNCEMENTS

June 6-10, 1997 The Society for Conservation Biology 11th annual meeting at the University of Victoria on June 6-10, will focus on Marine Conservation Biology with sessions ranging from molecular biology to cetacean life. Along with field trips to spectacular Pacific Northwest areas, there will be a Research Video Night hosted by Dr. Elliot Norse of the Marine Conservation Biology Institute on the evening of June 8th. The conference encourages entries of interesting marine-related video shot in the field or lab (5 minute limit of VHS format). Please contact Wendy Holland at reefnet@cerfnet.com for more information.

June 22-27, 1997 63rd Annual Meeting The American Malacological Union. Location: Radisson Hotel on the beach in Santa Barbara, California. The meeting will be held jointly with that of the Western Society of Malacologists. Two major symposia are scheduled: (1) Deep-Sea Mollusca, convened by Jerry Harasewych and (2) Traditional vs. Phylogenetic Systematics, convened by Gary Rosenberg. Info: Eugene V. Coan, President, AMU: gene.coan@sierraclub.org or Henry Chaney, President, WSM: inverts@sbmnh.rain.org. After the meeting, there will be a two-week long workshop sponsored by the Santa Barbara Museum of Natural History. It will focus on the marine, freshwater and terrestrial mollusks of southern and central California. For further information about this workshop: Paul Scott, Invertebrate Zoology, Santa Barbara Museum of Natural History, inverts@sbmnh.rain.org

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July 21-25, 1997 Fourth International Temperate Reef Symposium, Location:

Catholic University of Chile, Santiago, Chile, Info: Departamento de Ecología, Facultad de Ciencias Biológicas, Universidad Católica de Chile, Casilla 114-D Santiago, Chile, reef@genes.bio.puc.cl

July 21-25, 1997 XV Encontro Brasileiro de Malacologia / 15th Brazilian Malacology

Meeting, Location: Central Campus, Trindade, of the Federal University of Santa Catarina, Florianópolis, Santa Catarina state, Brazil, Info: Sociedade Brasileira de Malacologia, Pontificia Universidade Católica do Rio Grande do Sul, Instituto de Biociências, Av. Ipiranga, 6681, prédio 12, sala 211, 90619-900 Porto Alegre, RS, Brasil, ebfram@music.pucrs.br or pjsouza@ibm.net

September 1-4, 1997 International Congress on Palaearctic Mollusca, Location: Munich, Germany, The congress will focus on continental Mollusca, and plenary lectures will be given by E. Gittenberger, 'Aims and perspectives of research on continental Mollusca'; V. Lozek, 'Palaecology of quaternary Mollusca'; and Ph. Bouchet, 'Endemism, endangerment and conservation'. Free-lecture sessions, symposia and workshops are planned to cover many aspects of the systematics, ecology and biology of palaearctic Mollusca, and posters will be welcome. This congress will include a two-part conference on the Ecology and Taxonomy of Freshwater Mollusca, the first part to be held in Salzburg, Austria, between 19th and 21st February 1997, and the second part between the 1st and 4th August 1997, in Munich. The congress is organized by G. Falkner on behalf of Unitas Malacologia, and held under the auspices of Friedrich-Held-Gesellschaft, and Deutsche Malakozoologische Gesellschaft. Info: for further details and first-circular, please contact G. Falkner, Raiffeisenstrasse 5, 85457 Hoerlkofen, Germany, Tel/Fax +49-8122-93780. Email: Dr Stephen. A. Ridgway, Zoologische Staatssammlung Muenchen (ridgway@zi.biology.uni-muenchen.de) or Prof. Dr. D. Herm Bayerische Staatssammlung Palaeontologie (100071,1711@compuserve.com)

September 25, 1997 Young Malacologists' Forum - Malacological Society of London, Location: The Natural History Museum, Cromwell Road, London, U.K. Info: Alex Ball, E-mail: a.ball@nhm.ac.uk - Phone: 0171.938 8973, Research students and young post docs - come and tell us about your work, at this one-day meeting. This is an informal meeting where young researchers can meet with other malacologists to present and discuss some of their data and compare notes on methods and problems.

October 13-17, 1997 CLAMA III, the 3rd. Latin American Malacological Congress + IV Mexican Congress of Malacology and Conchilology, Location: Ensenada, Mexico. The first was held in Caracas, Venezuela in 1991, the 2nd. in Porto Alegre, Brazil, in 1995. Info: M.C. Claudia Farfan, Jefe Departamento de Acuicultura, CICESE, Baja California, Apdo. Postal 2732, Ensenada, BC, Mexico. WWW: <http://www.cicese.mx/oceano/acuicultura/iiiiclama.html> FAX (to be received in Mexico):(617) 44880, FAX (to be received in the States):(011) 52617/44880 Dr. Martha Reguero, E-mail: reguero@unamvml.dgsc.unam.mx Pablo E. Penchaszadeh, Vice-President of the Latin American Committee ana.penchaszadeh@newage.turbo.net, FAX: 54(1) 8035753, Argentina

July 25-31, 1998 WORLD CONGRESS OF MALACOLOGY, Washington, DC The 13th International Malacological Congress of Unitas Malacologica and the 64th Annual Meeting of the American Malacological Union, together with several other participating malacological organizations. Info: Dr. Rudiger Bieler - bieler@fmnh.org, Dr. Philippe Bouchet - bouchet@cimrs1.mnhn.fr, Dr. Robert Hershler - mnhiv007@sivm.si.edu, Dr. David Lindberg - david@ucmp1.Berkeley.Edu, Dr. Ellinor Michel - emichel@biology.lsa.umich.edu, Dr. Pablo Penchaszadeh - ppenas@usb.vb, Dr. Winston Ponder - wponder@extro.ucc.su.oz.au, Dr. John Taylor - j.taylor@mailserver.nhm.ac.uk

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