

Opisthobranch Newsletter

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READER FORUM

From Bob Bolland: Gobi-Nudi Symbiosis. At Steve Long's suggestion, I'm including partial data from my Okinawa Slug Site (<http://www.imicom.or.jp/~bolland>) which some readers of the Opisthobranch Newsletter may find of interest.

I usually feature an "Opisthobranch of the Week" from Okinawa; during the week of 23 March, 1998 I did something a bit different. In lieu of featuring a solitary species, I've presented an interesting symbiotic association between a relatively well-known gymnodorid nudibranch (*Gymnodoris nigricolor*) and several species of gobiid perciform fishes (*Ctenogobiops* spp. and *Amblyeleotris* spp.).

By way of introduction, certain species of gobies and snapping shrimps form a symbiotic relationship which is mutually beneficial for both individuals. The shrimp provide and maintain a burrow for the goby to dart into when a goby predator appears and the goby provides a tactile warning system for the poor-visioned shrimp. The goby rests at or very near the burrow entrance, waiting for the plankton it feeds upon to drift by, and as the shrimp excavates sand and rubble from the burrow it comes into close contact with the body of the shrimp, maintaining almost constant contact of the goby's body with its antennae; if the fish darts away to capture food the shrimp moves inside the burrow until the goby returns. In the event of a potential predator coming close to the burrow entrance, both the goby and shrimp rapidly disappear into the safety of the burrow. Yanagisawa (1990) has an excellent description of the goby-shrimp symbiosis as it occurs around Shikoku Island off the southern coast of Japan.

The association of the goby and nudibranch was first reported by Williams & Williams (1986), and has been commented on by Mulliner (1991). More recently, Osumi and Yamasu (1994) report on the possible parasitic relationship of the symbionts. To the best of my knowledge, Okinawa (Ryukyu Archipelago) is the only location for this unusual association. I'd be very interested to learn of any other locations outside the archipelago where this association has been noted. I have collection and observational data from my initial witness (11 May, 1989) of these animals continuing to the present.

During a typical year the symbionts are first noted during January and seen until about the middle of June;

reappearing about the middle of December. I have seen none at other times. The nudibranchs have been seen on all eight fins of the gobies: pectoral (L&R), pelvic (L&R), first dorsal, second dorsal, caudal, and anal. In some cases multiple nudibranchs have been seen on the same goby (in one case four, in several others, three). The attachment of the nudibranch to the fins would appear to be quite secure; it's quite remarkable to see the goby do an instantaneous turn about at the burrow entrance without dislodging the nudibranch. Depth range for the observed symbionts was from the intertidal to a maximum depth of 95ft.

No goby-nudibranch associations were ever observed during the months of July, August, September, or October. The symbionts have been observed by myself during the following periods:

1989: 11 May through 16 May (the initial observation)

1990: 03 Feb through 15 Jun & 31 Dec

*1991: 09 Feb through 10 Feb

1992: 30 Jan through 27 Mar

1993: 10 Jan through 14 May & 10 Dec

1994: 15 Apr through 20 May & 18 Nov through 20 Dec

1995: 11 Feb through 30 May

1996: 08 Jan through 30 Jun & 02 Nov through 29 Dec

1997: 01 Jan through 11 Jun

1998: 04 Jan through 07 Mar (as of 17 March)

During 1991 most dives were made at Horseshoe Cliffs, where the symbionts were never seen.

If you have Internet access you can view images of the above symbionts at the following URL:

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

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RANGE EXTENSION: *Navanax inermis* (Cooper, 1863). The range for this species is extended northward to Bolinas Lagoon, Marin County, California, where adult specimens were collected in December, 1992, during that year's El Niño event. - David W. Behrens

INFORMATION EXCHANGE

From: Jussi Evertsen: Hello again and thanks so much for ideas regarding nudibranch eggs. I have another request, this time concerning the genus of *Coryphella/Flabellina* and *Facelina*. In identifying individuals from these genera, I have to work with quite old literature, from 1840's and up to 1940 somewhere. These are works of Alder & Hancock (of course), Bergh,

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Loven, M. & G.O. Sars, Krause, Friele & Hansen, Meyer & Möbius, Løyning, Larsen, Odhner, and Lemche to mention the most important authors. As you can see, quite old stuff. I have also been using some of the new English literature from Thompson, but these descriptions are mostly from English waters, and are also lacking important species found up here.

A major problem are all the synonymies, and also that authors like Odhner also has put a great deal of the characters in internal structures like liver. Not much help of that in the field. I have got some help from the search engine on the seaslug website, but it seems to lack the consistency of valid species regarding the mentioned genera, for example which species is synonymous to which between *Facelina bostoniensis* and *F. auriculata* or are they separate species? Both Thompson 1988 and Picton & Morrow 1994 seem to discriminate between three species, including *coronata*.

As I am working with nudibranchs in Norwegian waters, and also arctic waters in my other project, I was wondering if there has been done any reviewing of these genera in recent times. Hopefully with a more North Atlantic side to it. - Trondhjem Biologiske Stasjon, Norway

From Sandra Millen: Amongst the many papers I am trying to finish, is one on the aeolid genus *Cumanotus*. I am requesting help from fellow slugs/ divers/ photographers for additional data.

I would love to have a few specimens of *Cumanotus cuenoti* for comparative purposes. It feeds on *Ectopleura dumortieri* in the Bay of Biscay, France. See Tardy, J. and H. Gantes, 1980 for a redescription. If anyone is diving in the region or has it in their collections would you please contact me?

In the Pacific U.S., I would appreciate information about sightings accompanied by one or two specimens (in 70% alcohol or 10% formalin or Bouins). There are two species, so I need a specimen or good photograph to see which is which. - Department of Zoology, University of British Columbia, Vancouver, B.C., Canada, V6T 1Z4

The November-December, 1997 issue of the Shell-O-Gram (Jacksonville Shell Club) has an article entitled "Environment Run Amok?" relating to *Caulerpa taxifolia* and the Mediterranean infestation. Volume 38(6):1,8.

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