

australasian nudibranch NEWS

No.4 December 1998



Hopkinsia sp.

A Doridina nudibranch of the family *Goniodorididae*, as yet unnamed. It may turn out to be a species of *Okenia*, a closely related genus.

It is reportedly restricted to the warmer waters of the northern NSW coast (Eastern Australia). They appear to grow to approx. 15mm, and their colouration may make them blend with the bryozoan upon which they feed.

My first encounter with *H. sp* was on the 29/6/1986 at Halifax Park, inside Port Stephens, NSW in 21m (*and the water was not warm*). After this first sighting they became fairly easy to locate, always on the bryozoan *Pleurotoichus clathratus*. Bill Chambers, a Newcastle based diver reported finding *H.sp* at Port Stephens in January 1998, indicating it is still to be found there.

I have records of this species from Catherine Hill Bay, south of Newcastle in 9m (in much warmer water). This is an exposed coast. My sightings occurred in a tiny cove, dotted with small underwater caves and open only to the full force of a southerly swell.

Going back through my own dive logs I came across observations of *H.sp* laying eggs, unfortunately I had not recorded the details of the spirals

Click on the image of *Hopkinsia sp* for more information.

Reference

Dr Bill Rudman.
Personal observations.

Editors Note

This issue has a European influence. Miquel Pontes kindly sent images of Mediterranean nudibranchs. Information on his web site, [M@re Nostrum](#) is this month's "Interesting Site" (see page 4).

Irina Roginskaya, Senior Scientific Researcher at the P.P.Shirshov Institute of Oceanology of Russian Academy of Sciences article "Why spirals" (see pages 2-3) is included after some technical difficulties with issue #3. Thanks to Irina for her patience and input.

The title of this newsletter may imply that its total focus is only Australasian nudibranchs. This is far from the case. I'm happy to feature nudibranchs from all parts of the world. Your input is warmly welcomed.

September 26th saw the official launch of the "Rhythms of Life" database project on the Sunshine Coast. It is designed for collating information collected by volunteers observations of the wildlife on the Sunshine Coast (at present). The main focus is birds and land based fauna and flora. Nudibranchs and cowries are now well represented with my databases being included.

For those reading this issue "on screen", check out the hyperlinks. Many of the images are hyperlinked to other sites. *C.kuiteri* at the top of the page is linked to my web site. *Hopkinsia sp*, is linked to the Australian Museum's Sea Slug Forum. Most of the logos are linked as well.

If the Queensland Museum still does not have The Wild Guide to Moreton Bay listed, [email me](#) and I can chase up a copy for you.

Requests

I am a second year student at the St.-Petersburg State University, Russia. My field of interest is ecology of Nudibranchia, especially the predator/prey system. I hope to do a study on Nudibranchs ecology this winter and would be grateful for any information about them.

Dmitry Redkin d_redkin@hotmail.com

Now available

I have been able to source copies of Neville Coleman's great little nudibranch identification book **Nudibranchs of the South Pacific Vol.1**. The book contains over 170 colour images nudibranchs of the South Pacific and Indian Oceans. Cost is \$15 (Australian) plus postage. With the Aussie dollar low against the US dollar it's a good time to add it to your library. Contact [me](#) for postage costs. At present, with postage it costs about \$17-18 US.

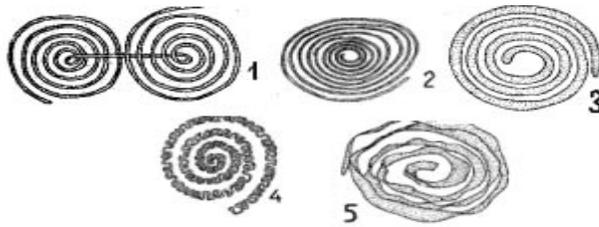


Merry Christmas
And A
Very Happy
1999

Why Spirals

Irina Roginskaya and Anna Schechter.

- 1&2. Egg ribbon of *Favorinus branchialis*
 - 3 Egg mass of *Tridachia crispata*
 - 4. Egg mass of *Dondice occidentalis*
 - 5. Egg ribbon of *Dendrodoris krebsii*.
- Bandel, 1976



First Costello (1938), later Gascoigne and Wallis (1982) called attention to the fact, that the spiral spawns of the nudibranchs and sacoglossans (Gastropoda, Opisthobranchia) conform to an equable or Archimedean spiral. The most remarkable phenomenon, that comes to light from a literature search is that in the northern hemisphere spiral egg-ribbons or egg-strings are practically always coiled leftwards or in counterclockwise direction. (Eliot, 1910; Costello, 1938; Gohar and Soliman, 1963; Kress, 1972; Roginskaya, 1987 etc.). The deviation from this conformity was revealed only near the equatorial zone (Bandel, 1976).

Although by many authors the very process of the oviposition of these Opisthobranchia had been carefully observed in numerous papers, as far as we know, the intrinsic mechanism of spiral coiling never had been the subject of scientific research. So, we (with late Professor A.B. Schechter) tried to explain why these molluscs from the northern hemisphere attach their egg-masses arranging them in the shape of spirals and why these spirals are counterclockwise directed (as viewed from the dorsal position) and approaching to Archimedean spirals.

While reviewing the literature, concerning the oviposition process of *Nudibranchia*,

Sacoglossa and some *Notaspidea* from the northern hemisphere, including our aquarial data on the egg-laying of the White Sea nudibranchs at the White Sea Biological Station of Moscow State University, (latitude 66°33'N) we came to the conclusion, that during the oviposition these molluscs were acting as if "intentionally" modelling the arrangement of the egg string in the shape of future Archimedean spiral.



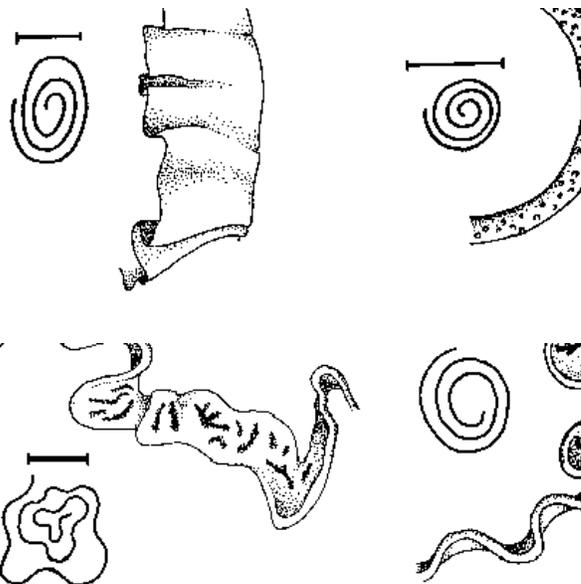
The left-coiled spawn of *Coryphella verrucosa* from the White Sea

While sliding along the substratum these molluscs, as a rule, are progress-

ing spontaneously in different directions, being permanently preoccupied in searching of available food. Their behaviour changes when egg-laying is about to take place. As it was shown by a lot of researchers (e.g. by Gohar and Soliman, 1967 (a-f)) the process of oviposition begins by the appearing of the egg cord from the genital aperture, situated on the right side of the body. The end of the spawn, sticky at the moment of deposition, adheres at once to the substratum, forming the fixed point (or the future pole) of the spiral.

Now the mollusc is fastened by means of the attached egg-ribbon as if being hold on an expansible lash (to the substratum). Further on the mollusc moves slowly in counter clockwise direction pulling along the gelatinous egg-ribbon, slowly, continuously extracted from the genital pore, and adhering at once to the substratum. This combined motion of the mollusc, comprising progressive uniform advancing straight forwards and the turn to the left, is "modelling" the motion of a point in a definite direction along the axis, while this axis is uniformly rotating counterclockwise around the fixed point - the pole.

So, the mollusc, moving during the egg-laying process, performs the conditions necessary for the transformation of its trajectory to a sinistral Archimedean spiral. And the sticky egg-ribbon continu-



Four right-coiled spiral spawns of four different species of opisthobranchs Queensland Australia, Kenny 1970

ously emerging from the gonopore and adhering to the substratum, is fixing this “spawning” trajectory of the mollusc.

It is clear, that the egg-ribbon, emerging continuously from the genital pore and adhering to the substratum, forces the mollusc to move forwards, not allowing it to change the direction of its motion to the opposite one. But why does the mollusc, progressing forwards during the oviposition, continuously turns leftwards in the northern hemisphere?

A similar effect can be induced by an acceleration, acting perpendicularly to the velocity of the spawning mollusc and directed leftwards to the direction of this velocity. This acceleration changes only the direction of the velocity, but not its numerical value. There is exactly such an acceleration, the so-called Coriolis acceleration, acting upon every material object, moving (with the changing of geographical latitude) along the Earth's surface and directed to the left of the velocity in the northern hemisphere and to the right in the southern hemisphere. Naturally we expected to find dextral spiral spawns of opisthobranchs in the southern hemisphere. Though we realized that we could not expect to find in the southern hemisphere the entire symmetry with the northern hemisphere, at least because the jet impulse from the spawn discharge from the genital pore (situated on the right side) acts in the same direction as Coriolis acceleration only in the northern hemisphere.

The review of all the literature available for us, and concerning the oviposition of the opisthobranchs from the southern hemisphere, discovered that most authors, giving a lot of valuable information, concerning spawns and spawning of opisthobranchs, confined themselves to a mere constation of the spiral shape of the spawns, and almost never discussed neither the direction of coiling, nor the direction of the moving of molluscs during egg-laying, or the point of view while drawing or photographing the spirals (e.g. Hedley, 1923; Hartley, 1964; Gosliner, 1981, 1982, 1985; Rose, 1983, 1985 a,b, 1986 etc).

But when we came across the four right-coiled spiral spawns of four different species of opisthobranchs from Queensland (Australia), depicted (without comments) in the article of Kenny (1970), and the seven large opisthobranch-like right-coiled spiral egg-ribbons, attributed to siphon-limpets by the author of this photograph – amateur-photographer T.E.Pitman (1972) from New Zealand, we were ready to think, that we have seen with our own eyes the verification of our assumptions.

Spiral of Archimedes

As it is known, mathematically the spiral of Archimedes is described by a point, moving uniformly in a definite direction with a velocity along an axis, while this very axis is uniformly rotating around the fixed point /the pole/ with an angular velocity. The angle of revolution of the axis from its position is proportional to the distance of the point from the pole. According to the direction of rotation of the axis (left or right) the Archimedean spirals are sinistral (counterclockwise) or dextral (clockwise directed).

The Australian Museum's Sea Slug Forum has posted a [comment](#) relating to the issue of spirals in the southern hemisphere.



Right-coiled spiral egg-ribbons, attributed to siphon-limpets T.E.Pitman (1972) New Zealand

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Interests:

1. Nudibranchia, mainly of Arctic seas.
2. Possible influence of the Earth rotation on vital activity of some marine invertebrates (Archimedean spirals of animal origin), not only those produced by opisthobranchs.
3. Nudibranchia in the fouling communities.

Interesting Sites

Miquel Pontes Garcia
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Miquel Pontes Garcia is a computer engineer in Barcelona, Spain. In 1996 he set up the non-profit project M@re Nostrum, created to spread knowledge about the sea amongst cyber-readers. It began as a small collection of SCUBA diving related articles written predominately in Spanish, and now includes English and Catalan as well.

M@re Nostrum (ancient Latin for "Our Sea") is much more now, with news about the sea and its ecology, descriptions (and pictures) of marine animals and lots of articles covering every imaginable area, from trips to technique, biology to oceanography. If searching for some marine related web, your starting point could be our Internet Directory.

Miquel kindly sent images of species from the Mediterranean Sea.



Flabellina affinis
©1998 Miquel Pontes



Godiva banyulensis
©1998 Miquel Pontes

Book Review

Wild Places of Moreton Bay

WILDLIFE AND HABITATS OF A BEAUTIFUL AUSTRALIAN COAST – NOOSA TO THE TWEED

A beautiful 432 page paperback produced by the talented team at the Queensland Museum, Brisbane, Australia. It is a comprehensive guide introducing the South East Queensland coast and its marine life containing more than 1000 photographs.

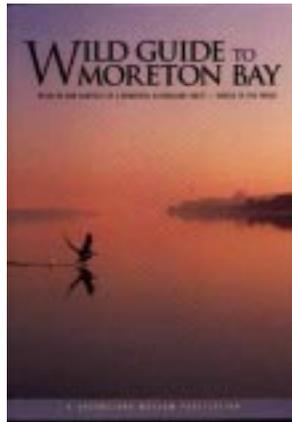
This book is a wealth of information presented in an informative and interesting way. Along with the museums other two publications, Wildlife of Greater Brisbane and Wild Places of Greater Brisbane a fuller picture of the beauty and biodiversity is presented.

The book is a valuable guide to anyone using Moreton Bay and adjoining coast. It describes the differing environments and the life within them. Fish and birds are covered in their own chapters.

To road test the guide Peter Davie kindly loaned me a copy. I visited one of my usual rocky headlands, just north of Moreton Bay and had a good look at the marine life in the pools. Afterwards I browsed through the guide and was to find many of the species identified.

Many people contributed their time and effort into producing the guide. Although it is not bursting with nudibranchs, they are covered.

If you have the slightest interest in this part of the Australian coast or in the Australian marine life buy this book. At \$24.95 plus postage it is great value. Copies are available from the [Queensland Museum's](http://www.Qmuseum.qld.gov.au) online bookshop (<http://www.Qmuseum.qld.gov.au>).



Contacts

Web Sites

Mike Miller's Slug Site
a great reference site. A must see
Australian Museum's Sea Slug Forum
Bill Rudman's site
The Okinawa Slug Site
Another site to visit regularly
Sherif's Malaysian Slug Site
A site for Malaysian nudibranchs
New Zealand Nudibranch Site
Ian Skipworth's site
Steve Long's Opisthobranch Site
Don't miss this page, great links.
Photos by Wayne Ellis
Erwin Kohler provides space for my photos
Bernard Picton's Home Page
Great nudibranch information section
Mediterranean Slug Site
Erwin Kohler's Site
German Slug Site
Wolfgang Seifarth site
Bibliographia Nudibranchia
Gary McDonalds nudibranch database site

Books on the Web

Capricornica Publication
Patty Jansen's natural history book site
Sea Challengers
Dave & Diana Behren's marine books site
Mountain, Oceans & Travel Publications
Barry Andrewartha & Belinda Barne's Sport Diving magazine site
Oceans Enterprises
Peter Stone's diving related book site



My own web site is now up and running.
Visit to learn about Kinesiology,
Robyn's new book, "Word Power",
Nudibranchs and more.
Wayne & Robyn's homepage
<http://www.ozemail.com.au/~glaskin>

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