

editorial**Vacancy – Opisthobranch project leader wanted**

Operation Wallacea, an ecotourism/research organisation, conducts surveys and expeditions to the Tukang Besi islands in SE Indonesia. We have a permanent research center on Hoga island in the Wakatobi Marine National Park and run around 20 research projects each season led by academics and lecturers from mainly UK Universities with the help of volunteers and students. Since 1997 we have conducted taxonomic surveys of Opisthobranchs in the Park. So far we have compiled lists of around 300 species with several remaining unidentified. The area is very rich and we expect several new species. Last year the project was expanded beyond a taxonomic survey to look at the ecology of the group. We are looking for a team leader to take on and further develop this project between July and September 2001. The Park is one of the most outstanding areas for coral reef biodiversity in the region.

Candidates must have marine biological background and some identification skills for Opisthobranchs (Molluscs). The team leader must be prepared to train and work with volunteers and students (involving field supervision of Honours and Masters theses, see website for titles of these)

For more details of Operation Wallacea and the project see website www.opwall.com

Letter of interest and CV (resume) to: science@opwall.com



Dave Harasti sent this image and request. "I originally thought it was *Hypselodoris bennetti* but now I think it might be *Chromodoris daphne*, any views?"

Ed: *Risbecia tryoni* (Garrett, 1873). Anyone else like to comment?

australian nudibranchs

akos
lumnitzer



Chromodoris splendida
(Angas, 1864)

Dive at many of our southeast Australian dive sites, from southern Queensland to southern NSW only, and you will almost certainly cross paths with this conspicuous nudibranch. In fact, I can assure you, that if you are diving in areas near the heads of estuaries and open dive sites and you don't see one you will be just about ready to give diving away altogether.

Chromodoris splendida is a member of the Chromodorid family and is also one of many southeast Australian dorids, which developed a form of mimicry amongst themselves. Have a look at www.seaslugforum.net to check out other similar looking species, such as *C. tasmaniensis* and *C. hunterae* and indulge in the strange phenomenon of mimicry.

This species is instantly recognisable with its dorid shape, yellow line running right around the mantle edge and the blood red spots on its dorsum. Funnily, no two specimens ever seem to have the same arrangement of dots and like fingerprints in us humans, it would be a good way to identify individuals at a dive site. If you have dived from Sydney to anywhere the species' northernmost distribution range, you would notice that the further north you dive, the bigger the spots are in specimens. I haven't been past North Solitary Island yet (in northern NSW), but I noticed specimens sometimes have one very large spots on the dorsum, or maybe a few fairly large spots. In the Sydney area, they generally have many small spots and even take on a "peppered" appearance, much similar to *C. daphne*. Gills are white with red, vertical lines from base of gill to tip. Their rhinophores are also blood red on the tip, with a white base. The length of *C. splendida* varies and around the Sydney area they are usually from 30-40mm long. Recently while my wife and I were up at Nelson Bay, Port Stephens, we could not believe how big the specimens were up there! The diet of *Chromodoris splendida* consists of sponges, so you're likely to see them in areas with good sponge growth.

The photos are from four different spots, although three of them are from Sydney itself. One is Camp Cove in Sydney Harbour. Another one is from Shark Point, Clovelly and finally Bare Island La Perouse. The fourth was taken at North Solitary Island in northern NSW and you should see a clear difference in the spot sizes between the northern and southern specimens. Even the ones from Sydney are a little different in their spots.

Being a lover of sea slugs, I am always captivated at even the most common-looking species, such as *Chromodoris splendida*. I simply can't understand how some divers could be bored of looking at them.



sunshine coast



wayne
ellis

Chromodoris sp. 1 from the January 2001 issue is *Chromodoris tinctoria*. Bill Rudman has dissected many of these and concludes it is not a new species. The egg mass has also been described in Nerida Wilson's honours paper.

Chromodoris cf geometrica is in fact an undescribed *Hyselodoris* which is currently being described.

The cowry mimic is *Chromodoris babai*. Gosliner and Behrens 2000. Richard Willan also collected two animals at the Gneerings. The first, in August 1984, went to Dr. Rudman – Australian Museum and the second, in September 1990, since then Richard has had several additional animals from Norfolk Island, it must be widespread in the SW. Pacific Ocean.

The images below are courtesy of Richard Willan and Bob Bolland via Dave Behrens.

Fig on the left are Richard Willan's from the Sunshine Coast, those on the right Bob Bolland for Okinawa. The first of Richard's images is a close match for Steve Grail", sighting (Vol.3.05). Photographed (30mm) nestling amongst encrusting organisms on a vertical wall, 18 metres, 25 April 1984

The bottom right photo (26mm) on a rock near clean sand, at 21 metres, 8 July 1990. Richard added the following observations: "When animals of *Hyselodoris babai* are crawling they frequently raise and lower the expanded anterior end of the mantle over the head with a regular waving motion. In addition the gills waggle to the fro continuously. These distinctive behaviours are exactly the same as *Chromodoris geometrica*, *C. vibrata* and several other *Chromodoris* species display, and so I suspect these species should all be in the same genus united by these behavioural synapomorphies as much as morphological features. These existing distinction between *Chromodoris* and *Hyselodoris*, which is based on the radula, is too arbitrary to be useful any more."



irina rosinskaya nudibranchs



**irina
rosinskaya**



***Acanthodoris pilosa* (Abildgaard in Müller, 1789)**

Here are some photographs and the short account of the natural history of the northern dorid nudibranch *Acanthodoris pilosa* /Abildgaard in Müller, 1789/.

In the intertidal zone of the White Sea *A. pilosa* are common from April up to the end of September /in May- August in considerable numbers/, usually on the brown alga *Ascophyllum nodosum*, overgrown with the encrusting bryozoan *Flustrella hispida* /Fabricius/. This ectoproct is the favorite food object of *A. pilosa* /and in the Kandalaksha Bay near the White Sea Biological Station of Moscow State University probably the exclusive/. I have never observed feeding by this species on any other bryozoan in this locality.

The mantle color of *A. pilosa* varies from pure uniform white up to dark-brown nearly black /so-called var. *fusca* Lovén/ /fig.1,2/. The bright yellow specimens with orange clubs of rhinophores, as well as the light-beige /fig.3/, grayish animals, and white exemplars, mottled with dark-brown dots, are also common. You can without fail find this species on *Ascophyllum* on the accumulation of fluffy mats and muffs of *F. hispida*. Sometimes it is even difficult to detect at once the presence of the dark form of *A. pilosa* from its dark-brown prey, as it perfectly mimics the texture and color of the bryozoan. But the specimens of all contrast color variations also prefer brown *Flustrella hispida*. /The photo of beige coloured animal was taken in the Barents Sea, where *Acanthodoris pilosa* is also very common/.

The mantle is covered with soft conical papillae. The anus is surrounded by 9 tripinnate gills. The margins of rhinophoral sheaths are indented, bearing 3-5, sometimes 7-8, pointed lobes. Radula narrow, its formula : 25-28 x 5.1.0.1.5. The large first lateral tooth - with long processus /fig.4/. The labial disc consists of rather expressive structural elements, similar to minute human hands /fig.5/.

The spawning period of *A. pilosa* extends from the middle of June up to the middle of September. The specimens of all color types take part together in the mating process, and deposit characteristic egg-ribbons in the form of white collars, stuck with one side to the substrate (fronds of *Ascophyllum nodosum*, shells of live *Mytilus edulis*, walls of aquarium in the laboratory, etc.) /figs.1,6,7/. The egg ribbons laid by the animal at the beginning of oviposition are spirally coiled in laeotropic direction. The number of eggs in spawns ranges from ~ 800, up to ~ 11000. *A. pilosa* in captivity can lay 7-8 egg-ribbons with the intervals 1-2 days. The eggs are small: the diameter of fertilized ovum is about 63 microns. The oval egg-capsules /~130 x 105 microns/ usually enclose only one egg, rarely two. In captivity the period of embryonal development within the egg capsule depends upon water temperature in the aquarium, e.g. 10-12 days at 11.7°C, or 7.5-8 days at 15,0°C. Then the hatching of planctotrophic veligers with turbospiral larval shell occurs.

The juveniles of the new generation can be checked in the thickets of *Ascophyllum* on *Flustrella hispida* in September. And up to the middle of September the rare spawns of *A. pilosa* still could be observed in the field. Beginning from October *A. pilosa* practically disappear from the intertidal zone, probably migrate to more deep and stable waters, until next April, when starts the gradual reappearance of the population of mollusk in the belt of *Ascophyllum*.

In cold winter months only rare *A. pilosa* could be found in their usual summer locations, but single specimens I observed in February at low tide even in most frosty days, when air temperature reached -17 °C, the frozen littoral algae were covered with ice and the water temperature - below zero. The contracted *A. pilosa* were floating motionless together with some other nudibranch species /e.g. mutilated *Dendronotus frondosus* (Ascanius) /, washed away at the beginning of rising tide.

Literature.

1. Roginskaya I.S. 1985. *Acanthodoris pilosa*. // Shells and Sea Life.Reader Forum. .Vol.17, no.11, p.236.
2. Roginskaya I.S. 1987. Order Sacoglossa, Order Nudibranchia. Pp.151-202 In: Mollusks of the White Sea. Review of Fauna of the USSR, no.151. Nauka, Leningrad /in Russian/.

Explanation of pictures.

Fig.1 *Acanthodoris pilosa*, dark form, with spawn. White Sea, Solovetskie Islands. Body length 21 mm.

Fig.2. The sole of the foot of the same.

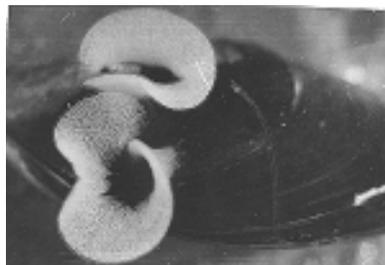
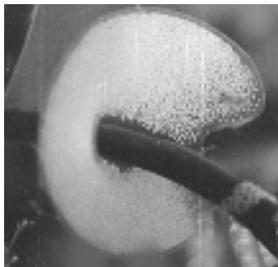
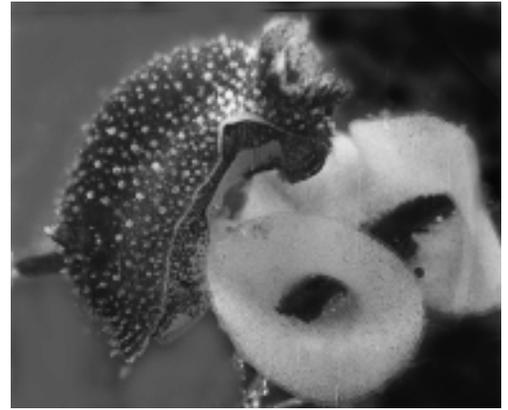
Fig.3. *A.pilosa*, beige form. Barents Sea, Aynovskiye Islands.

Fig.4. *A.pilosa*. White Sea. 1st lateral tooth of radula

Fig.5 *A.pilosa*, fragment of labial armature. SEM photo.

Fig.6 *A.pilosa*, two spawns on *Mytilus edulis*. White Sea., Solovetskiye Islands

Fig.7. *A.pilosa*, the spawn on *Ascophyllum nodosum*. White Sea. Kandalaksha Bay.



**images © 2000 -2001 I.S.Roginskaya.
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mediterranean nudibranchs



**miquel
pontes**

***Diaphorodoris luteocincta* (M. Sars, 1870) var *alba* (Portmann & Sandmeier)**

This doridacean is a small nudibranch that can reach a maximum length of 11 mm. The base color of the body and mantle is translucent white. The *D.luteocincta* has a dark red blotch in the middle of the mantle, which is covered with many short white conical tubercles and it is encircled by the characteristic yellow band that gives the name to this species.

For this species it has been described the “*alba*” variety, considered by some authors as a different species, which is typical to the Mediterranean, and is characterized by having the central dorsum colored white, without the red blotch typical of *D.luteocincta*. Our pictures were made in the Northwestern Mediterranean so they correspond to the “*alba*” variety.

Rhinophores are long compared to the length of the body and they are finely carved in spiral, a trait that improves the sensory function of these organs. They are also colored translucent white. The branchial plume is located in the back of the mantle and it is retracted when the animal is disturbed.

The *Diaphorodoris luteocincta* lives on the rocky bottoms and shadowed walls sharing its habitat with its main food source. It preys on bryozoans of the gender *Crisia* or, depending on the authors, on *Smittina reticulata* sponges.

This species can be found in the Eastern Atlantic from Norway to the Mediterranean Sea.

The etymology of the name derives from *Doris*, a nymph of the ancient Greek mythology. *Diaphorodoris* means “diaphanous Doris”. *Luteocincta* makes reference to the bright yellow band (*luteo*=yellow in Latin) that encircles the mantle of this opisthobranch.

You can find more information and pictures about this nudibranch at the following sites:

• **Erwin Köhler’s site about Mediterranean nudibranchs, Medslugs:**
http://www.medslugs.de/E/Mediterranean/Diaphorodoris_luteocincta.htm

• **Bernard Picton’s site about nudibranchs of the British Isles:** <http://www.pictonb.freeseerve.co.uk/nudibranchs/dialut.html>

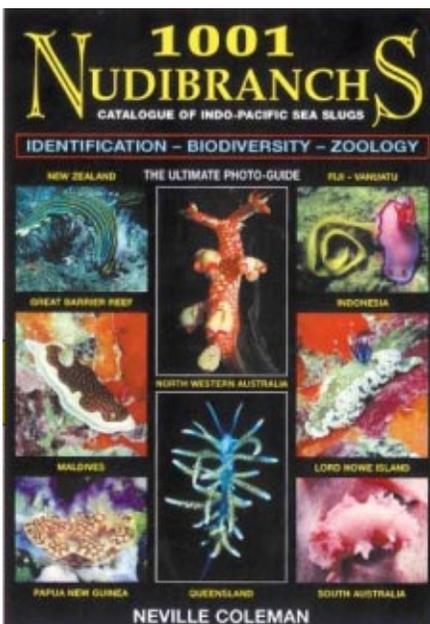
• **Frank Moen’s site Underklasse Opisthobranchia Bakgjellesnegler (Norwegian):**
http://kystnett.no/~emil/nudibranchia/diaphorodoris_luteocincta.htm

• **M@re Nostrum opisthobranch pages (Spanish) :** <http://marenostrum.org/opisthobranquios/dluteocincta>

The small size of this nudibranch makes it difficult to find and even more difficult to photograph. We used a Nikonos V camera with a 35mm lens and macro 2:1 adapter. Film used was Fuji Velvia 50 ASA. f/16 mode A.



photos ©2001 miquel pontes



Neville Coleman has a problem – he has to finally decide which photographs to leave out of the new book. So many people have contributed that the image count is now over 1500 images. This book is going to introduce many of us to species we never imagined existed.

Neville has asked me to apologise to those who have already ordered the book for the delay. He hopes you understand and appreciates your patience. (Personally, I think the wait will be worth it.)

To order your copy at the special pre release price email Wayne Ellis at glaskin@ozemail.com.au for details.

Visit Neville's website at www.nevillecoleman.com.au



richard willan

Part 2: Relaxation

Why, you might ask, should nudibranchs require kinesiology? With respect to Wayne, whose profession it is and who will tell you kinesiology is about more than just relaxation, relaxation of nudibranchs prior to preserving them is essential for later scientific study. To continue the analogy, a nudibranch dropped into a preservative fluid is anatomically just as "screwed up" as we feel mentally after we have had a week in which nothing has gone right. Relaxing nudibranchs is the key to successful dissections. Because nudibranchs have evolved from spirally-twisted, shelled ancestors, their body systems are very complicated internally, particularly their digestive and reproductive systems, so there is enough trouble tracing out the organs in these systems without having to cope with an animal so contorted that its gills are scrunched up next to its rhinophores and there are no anatomical landmarks to work out which organs are which. Such deformations are entirely possible because nudibranchs have hardly any muscles securing organ systems to the body wall (**extrinsic muscles**) and these get torn when an animal is in its death-throws.

Therefore it is essential to relax an animal properly. If you prefer it, then more socially acceptable euphemism, **euthanasia** could be used instead of relaxation because the specimens need to be put to death gently. The proper technical term for this process is **narcotization**. It can be quite difficult to judge exactly when an animal is dead because the time interval between death and onset of tissue disintegration (**histolysis**) can be very short, especially in very fragile nudibranchs and sacoglossans. The time taken for successful narcotization varies enormously with different species and different techniques - from half an hour to half a day. But no matter what technique you use, you need to check the animal regularly during the process. The best way to test for a response that would indicate the animal is still alive, is to touch it with a pin, especially on the gills or cerata. If there is no contraction response, you can be fairly sure the narcotization has been adequate. If you see some contraction, then continue the narcotization for a little longer.

This process of narcotization can be time consuming, but remember if you are going to remove it from its natural habitat, you owe it to the animal to preserve it in the best possible condition for future study.

There are two different forms of narcotization – physical and chemical. Physical techniques involve altering the temperature or the salinity of the seawater. Probably the simplest method of all is chilling the animal. Put the animal in a bowl of seawater with a large surface area and place it in a refrigerator. As it cools down, the animal will stretch out as though it were crawling, and the rhinophores and gills will emerge and spread out. Although this technique is simple, it has two drawbacks; the animal may be just slowed down metabolically by the cold but not dead, so it will still contract when it is preserved and, worse, some tropical opisthobranchs react violently to chilling below their usual water temperature. Kerry Clark gave the example of certain ceratal-bearing sacoglossans that drop all their cerata with perhaps a 10° C reduction over an hour period. This chilling process should never be taken to freezing because the ice crystals thus formed tear apart the organs inside the body. I have found that warming the water of tropical nudibranchs by about 10° C induces torpor that is as effective as narcotization. The problem with heating is that the time between death and histolysis is shortened significantly. Adding fresh water to the seawater in which the animal is crawling in can sometimes bring about gradual death, but if this method is left for too long the animals swell up like little balloons from the process of osmosis.

Chemical techniques for narcotization take longer but they are usually more successful for a greater range of nudibranchs. Kerry Clark (he must have been desperate poor fellow) used ethanol, in the form of Vodka and white rum, a few drops at a time. I have tried menthol (also known as peppermint camphor) flakes, and know of others that have naphthalene (Tar camphor) and nicotine flakes, sprinkled on the surface of the bowl. However these days I use an 8% solution of magnesium chloride in fresh water myself when I am narcotizing animals. The chemical, which is available from chemists, acts on the animal's nervous system and the fresh water has an added effect in that it induces an added mild osmotic stress. Instead of adding freshwater, some scientists place the bowl containing the animal with magnesium chloride solution in seawater into the refrigerator and let it cool gradually.

In using any chemicals, make yourself aware of the possible side effects on humans. We all know the effects of ethanol. Magnesium chloride and menthol are harmless (unless taken in large doses) but they can cause mild irritation of skin and eyes in some people and menthol should be used where there is good ventilation. Naphthalene, if inhaled as a dust, can cause irritation of the nose and throat and headaches, so it too should only be used where there is good ventilation.

My name is Steve Dales, I live on the waterfront at Redcliffe, just north of Brisbane and recently, while collecting live shrimp as food for my saltwater tank, I was fortunate enough to find 3 nudibranches. They were in tidal rock pools just down the beach, the actual headland is known as Scott's point.

There was a mass stranding here about a month ago which was very sad to see, particularly since I wasn't even aware they lived in the bay or in what numbers. There were two varieties, the mottled brown one as shown in the attached JPG which were in the majority and a typically smaller green one. I managed to save two and the day after placing them in the tank, they laid an egg string, which in turn hatched within days which astounded me, particularly given the quantity! The adults died about a week later, they appeared to shrink in size gradually and just die. The eggs (I have attached a pic of them as well) which are now larvae I presume, are doing well considering, I placed them in an old glass cordial bottle with an air stone to keep the water oxygenated. I had recently used the bottle to hatch brine shrimp but neglected to empty it, subsequently there was a bit of algal growth on the inside so I simply refreshed the water and popped the eggs in the air stone and that was it. Most of the larvae have not grown at all and are still less than a millimetre in length but a few have reached about 3mm.

I read on the Sea Slug Forum that their growth can be suspended so to speak until they come across an appropriate food source. I suppose this is the crux of my communique really, what the heck do they eat? I would love to be able to keep them but am not sure what to feed them, I read that they can be very fussy. Any information would be greatly appreciated, and if you would like any more local info please do not hesitate to ask.

Cheers,
Steve Dales.



Can anyone help Steve with his request?

continued from page 52

My final piece of advice on narcotization is to try it with some common species first. Remember that the Egyptian practised their mummification techniques on hundreds of ibis and cats before they graduated to humans.

References

Clark, K. 1995. Message posted on Mollusc List Server.

Material Safety Data Sheets (MSDS's) specific for magnesium chloride (10149 - issued May 1996), menthol (AJ1XK - issued January 1996) and naphthalene (AJ191 - issued May 1995) issued by Merck Pty Ltd, Kilsyth, Victoria and AJAX Chemicals, Auburn, New South Wales.



dave
behrens

Marine Mollusks in Japan.

2000. Takashi Okutani (Editor)

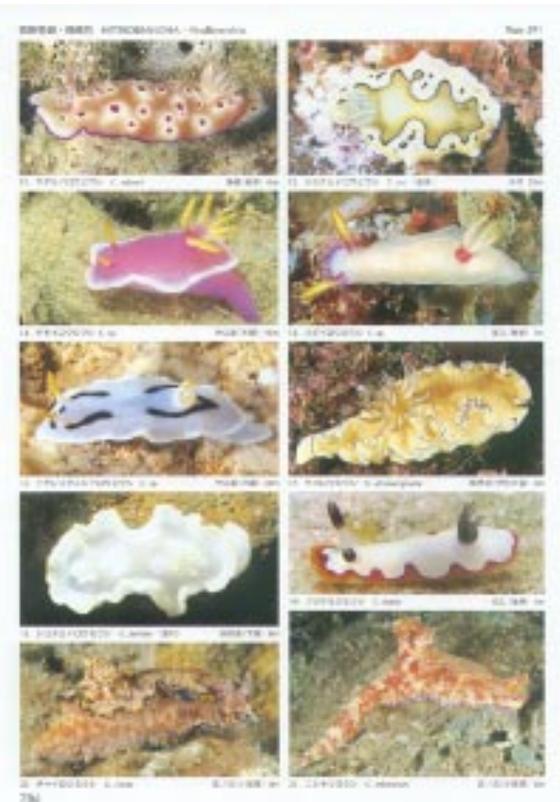
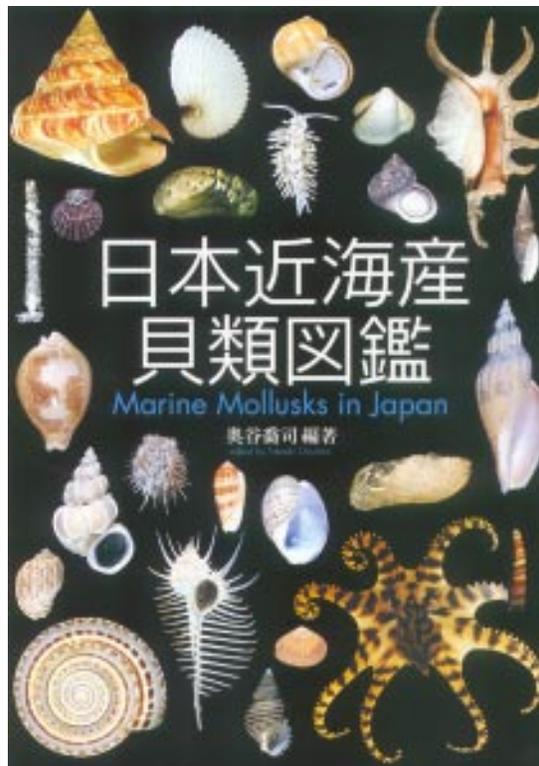
A couple of years back when *Mollusca - The Southern Synthesis* was published, most of us were totally at awe with its breadth and coverage. We also weeped at the price, which meant it would not see the shelves of most of our libraries. Well here is another unbelievable book that will produce the same gut reactions.

Marine Mollusks in Japan has just been released and provides us an absolutely overwhelming look at the mollusc fauna of Japanese waters. The book, better referred to as a monograph includes full color photographs of 5106 species of marine molluscs, including the aplocophorans, chitons, shelled gastropods, opisthobranchs, scaphopods, bivalves and cephalopods. The text (1224 pages) includes examples of all Japanese marine species from micro-mollusks, to newly discovered species and some deepwater species. The coverage, at the risk of being redundant, is incredible.

The text, which is presented in both Japanese and English (Hurray) includes scientific name (author and date of description), morphology, size, and distribution. An example of a page of color plates from the Opisthobranch chapter is shown here. For the other molluscan taxa color photos include both the dried shell and the animal alive in nature.

For the Opisthobranch buffs, the identifications and text were provided by Dr. Iwao Hamatami. I find almost all the identifications to be accurate but am somewhat disappointed by the lack of current new names for several species described in the last year or two. The reason for this however, maybe be that a book of this size must have been in preparation for a long time and the publisher simply had to place a deadline on contributors input.

All in all, I must admit, just when I thought we had seen the last of the new, great Branch books (and Neville's still hasn't hit the streets yet) here comes one more. Do we recommend all 6000 beautiful photos - you bet we do. For most of us however, this one will have to wait for your upcoming birthday, maybe your anniversary from that special loved one, or at least next Christmas. Depending upon your source, it retails at between \$324.00 and \$335.00 USD. That's about 26 cents a page, which when you think about it, isn't that bad, because that makes it comparable to most of the other mollusks books of this quality available today.



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