

A portrait of Chromodoris kuniei feeding on a sponge offers a clear view of its frontal rhinophores and dorsal, exposed gills.

NUDIBRANCHS

THE JEWELS OF NEPTUNE

Much loved and sought after by underwater photographers, these toxic marine slugs come in a dazzling variety of colors and shapes

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Despite their being quite common in worldwide temperate and tropical waters and most of the times being quite spectacularly shaped and colored, nudibranchs – or “nudis” in divers parlance – are still a mysterious lot to plenty of people. What are those technicolored globs crawling in the muck? Have they got a head? Eyes, anyone? Where’s the front, and where the back? Do those things actually eat?

Well, to put it simply, they’re slugs – or snails without an external shell. About forty Families in all, counting literally hundreds of different species: in scientific lingo – which is absolutely fundamental even if most divers shamefully skip it – they’re highly evolved *gastropods* (*gastro*=stomach, *pod*=foot: critters crawling on their belly), belonging to the Class *Opisthobranchia* (*opisto*=protruding, *branchia*=gills: with external gills), ie close relatives of your common land-based, lettuce-eating garden snails. Like those drably colored pests, nudibranchs are soft-bodied mollusks which move on the substrate crawling on a fleshy belly which acts like an elegantly undulating foot (if disturbed, some of them can even “swim” some distance

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A pair of Hypselodoris apolegma prior to mating. Nudibranchs utilize their gaudy aposematic coloration to advertise their toxicity to would-be predators.



A telling sample of the stunning variety in shape and colors offered by the nudibranch tribe. Top left, *Chromodoris geminus*; top right, *Chromodoris splendida*; bottom right, *Halgerda willeyi*; bottom left, *Gymnodoris ceylonica*.



Far left, a mating pair of the splendidly colorful *Nembrotha purpureolineolata*. Left, a large *Ceratosoma tenue* is laying its eggs, joined together in a lace-like, colorful ribbon.

■ A side view of *Chromodoris tritos* clearly shows the salient features of this nudibranch genus: frontal rhinophores, dorsal naked gills, undulating mantle and fleshy foot used for locomotion.



away, like the famously wriggling Spanish dancer *Hexabranhus sanguineus*). With a few rather fascinating differences, however: first of all, as their name (nudibranchs: with naked gills) implies, they extract oxygen from water via their external gills, easily identified in most species as a little graceful tuft of soft, comb-like tissues protruding from their back (beware: they can retract it with surprising speed if molested). Second, the four little cutesy "horns" of land-based snails are substituted in nudibranchs by two small, similar looking frontal protrusions named *rhinophores* (*rhino*=nose, *phores*=bearers: nose-placed sensors), complex sense organs which are able to detect food particles in the water column, light level variations, smells in the current and so on. Third, lacking an external protective shell, they have developed a most fascinating way to defend themselves: most of them are able to store in their own tissues the noxious chemicals contained in their preferred food items. Since they mostly feed on horribly unpalatable items as sponges, ascidians, stinging hydroids and quite often other nudibranchs (I told you they have pretty interesting habits!), the stuff they're able to ingest is pretty powerful, being made of corrosive acid-like compounds and making them rather unappetizing for the



Chromodoris coi is a rather common and most beautiful species found in the Indo-Pacific. Note its dorsal, feather-like naked gills and the specialized sense organs called rhinophores in the front.



More nudibranch eye candy! Far left, a veritable underwater orgy with no less than four simultaneously mating *Hypselodoris apolegma*; top right, a particularly colorful variation of *Chromodoris kuniei* from Borneo; bottom right, the very common *Phyllidia ocellata*.

A triumph of gaudy colors and patterns to boldly advertise their toxicity

A very large and remarkably colorful species, *Chromodoris albopunctata* can be immediately identified by its bright orange "foot".



other denizens of the deep. These toxic substances can be stored in the body tissues or in the flailing and expendable dorsal appendages called *cerata*, typical of several species, to be loosed in the surrounding water when need arises to ward off marauding predators – or to give a nasty shock to the predator who unluckily tries to chew on them: the single specimen might be lost, but the lesson in avoiding similar animals in the future would be passed on. This, in turn, has allowed nudibranchs to evolve what is called an aposematic livery, ie a spectacular and colorful warning pattern which openly advertises their toxicity as food items. This is a wonderful advantage not only for the roving underwater photographer who happens to bump into them during a dive, but for many other quite perfectly harmless creatures, who will in fact openly mimic nudibranchs to avoid being eaten, like the Clown or Warty Frogfish *Antennarius maculatus* babies. Their feeding habits are fascinating for many more reasons: to scrape away at the rough abrasive surfaces of sponges or to implacably draw inside their gut a living, writhing fellow nudibranch as big as themselves, they have developed a rasp-like tongue (found in land-based snails also) called a *radula* and covered with more than 750.000 chitinous, back facing teeth. This

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More examples of the immense variety in body shapes and coloration offered by nudibranch species. Top left, *Reticulidia fungia*; top right, *Tambja sagamiana*; bottom right, *Thecacera picta*; bottom left, *Phillydia coelestis*. Belying their jelly-like appearance, most nudibranchs are in fact quite firm and rubbery to the touch.



Top left, the highly variable *Nembrotha kubaryana*; top right, the unmistakable *Ardeadoris egretta*; bottom right, the gaudily patterned *Chromodoris leopardus*; bottom left, *Chromodoris tinctoria*.



horrifying instrument is hidden inside a proboscis-like mouth which can be extruded at will to fully engulf very large, living prey. Luckily for us, most of them are quite small (from a few millimeters to about thirty centimetres long, but the average is between two and ten), easily found in daytime and very easy to approach.

HOW TO ENJOY LIFE AS A NUDIBRANCH

Despite being what could only be called – with a measure of desperate kindness – a technicolored blob of venomous jelly, nudibranchs are also very lucky little fellows. They seem to mostly do three things only: move around (a lot), eat enormous quantities of spicy food without paying the consequences (a lot, in fact), and have enviably long and incredibly flamboyant sex sessions (lots and lots of them, again). The matter of nudibranch sex seems to be particularly fascinating, as the little lucky slugs happen to be hermaphrodites, ie every single individual boasts both male and female organs: since both are put to good use during lovemaking, and nudis apparently also greatly enjoy group sex, the possibilities for interesting combinations seem quite endless! Well, without getting into further potentially embarrassing details, it's these three activities that

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Far left, top, *Chromodoris magnifica*, an extremely common species of tropical waters; far left, bottom, another common species, *Chromodoris geometrica*. Left, a beautiful *Chromodoris coi* laying its ribbon-like clutch of eggs.

*A living, undulating carpet
of venomous, rubbery jelly*

Dendrodoris tuberculosa is a very large and exceedingly impressive species which is however rarely noticed by divers.



make nudibranchs such interesting subjects of underwater observation and photography. They're not difficult to come by, both in temperate and tropical waters, although for some curious and unexplained reason some places just seem to be richer with them: best spots in SE Asia for truly spectacular specimens and uncommon species seem to be in coastal areas with lots of silty bottoms, like in Kapalai and Lankayan (Sabah, Borneo) or the Lembeh Strait (North Sulawesi), but you certainly can expect to see lots of them anywhere else, even on oceanic, coral-rich reefs. Just scan the bottom up close and take a good guidebook along, as nudibranchs come in literally hundreds of sizes, shapes, patterns and colors – making it great fun to collect them all on digital but making it also a headache correctly identifying them all in the field. Remember however most nudibranchs have a rather short life and some species are quite seasonal, so do not expect to see all the species you're looking for in a short stay – it takes years to build up a good collection of representative and behavioral shots. Genus assignment and naming is also in a state of constant flux like with many other animal species, and the same specimen – particularly with the less common ones - can go by two different names in two equally and perfectly respectable volumes.



Far left, top, the strikingly patterned *Hypselodoris nigrostriata*; far left, bottom, a trio (or should we say in this case threesome?) of mating *Hypselodoris whitei*. Left, a pair of *Nembrotha cristata* are feeding on a clump of unpalatable hydroids and ascidians.

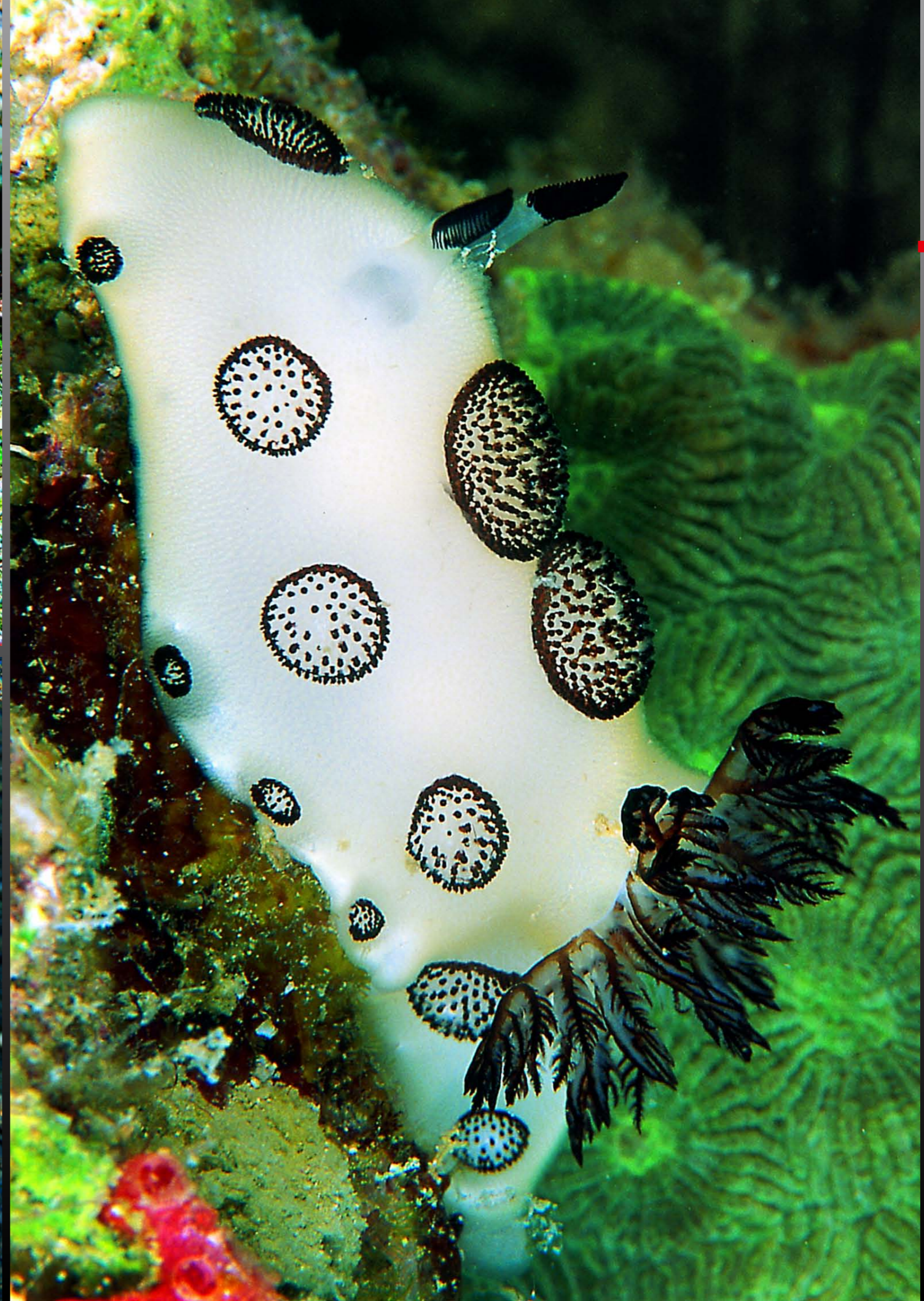
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Hypselodoris jacula is a rather uncommon but truly stunningly patterned species of the Central Indo-Pacific.

SAY "CHEESE" – BUT WHERE'S YOUR MOUTH?

Now, most nudibranchs are so unbelievably showy because most of the times you'll spot them on rather drab backgrounds – silty or coarse sand bottoms, dead coral, muck and so on. There's apparently a very good reason for this – being soft-bodied and scaleless they probably don't like being burnt by the live corals' stinging cells, the so-called nematocysts. So don't try to be creative when you find one and attempt to take that perfect creative shot by picking up the poor little fellow and placing it on a gaudy coral perch, as such a silly move would only be wildly inappropriate – both from a biological point of view and from a strictly photographic one, as you want a mildly uninteresting background to sharply set off the nudibranch's delicate body shape and often amazingly colorful livery. Moreover, trying to pick a nudibranch up to place it somewhere else almost invariably ends up with the little now rolled-up slug wildly rolling in slow-motion and floating away in the current without ever settling down again for you. Of course there's exceptions to the rule: nudis can and will be now and then found on living hard corals, and some species habits offer great photo opportunities: many species can be found feeding on



Far left, top, the somberly patterned *Phyllidiella rosans*; far left, bottom, the tiny *Hypselodoris emmae*; left, the large and unmistakable *Jorunna funebris* - an imposing species which is often observed in small aggregations.

brilliantly colored ascidian colonies, and the queer-looking, black-and-white *Jorunna funebris*, for example, will almost be invariably found – often in small groups – on the purple-blue vase sponges it ravenously feeds on – a gorgeously contrasting background for great close-ups.

A few more phototips: one, try to avoid that all-too-easy dead vertical shot – don't frame the nudibranch as if you were trying to dive bomb it. Try to lay down on the bottom as flat as you can and go for some creative shots – profiles or full frontals usually work nicely to show the separation between the actual body of the animal and the underlying ventral foot, or to take advantage of the soft elegance of the undulating mantle. Also, don't click away like a mad machine gunner when you spot a nudibranch – first get close, and then even closer (I'd love to say "till you see the white of their eyes" here but sadly I can't) and wait for the little slug to settle down and relax after bearing the shockwaves of your approach. Try to fill the viewfinder up with your subject without cutting out of frame any body parts, and always check for the rhinophores and the gill tufts to be extended – you do not want to photograph the animal with those tucked in. Given their small size, a



■ A portrait of a rather common but nevertheless beautiful *Hypselodoris bullockii* as it lays its lace-like egg ribbon. Classification of nudibranchs is in constant flux as new species are discovered and named on an almost daily basis.



■ Nudibranchs belonging to the genus *Ceratosoma* are some of the most impressive, largest, more colorful and strangely-shaped divers can hope to encounter. Top left, *Ceratosoma sinuatum*; top right, *Ceratosoma tenue*; bottom right, *Ceratosoma gracillimum*; bottom left, *Ceratosoma trilobatum*.

macro lens is obviously a must – for DSLR in an underwater housing users, that usually means a 105mm. And always try to nail them while they’re doing something – especially feeding or having sex. Large species like some *Risbecia* or the stiff-bodied winged *Ceratosomas* will sometimes carry around one or two Emperor shrimp *Periclemenes imperator* on their backside, a great bonus to the photographer: Spanish dancers *Hexabranhus sanguineus* usually have one or two of these tucked up close to their tufted gills, so look carefully before you click. Lucky divers sometimes even spot them while they are laying eggs – millions of microscopic pearls which build up in an extraordinarily graceful lace-like red, pink or yellow ribbon, which really livens up the shot. Take your time – your subject won’t run away in this occasion – and you’ll discover that even nudibranchs can strike graceful, glamorous poses. But beware ! Like frogfish or gobies, these critters are addictive – once you’ve photographed one, you simply have to to photograph them all, and that is going to be some serious business. ●



Often exceedingly small - ie a few millimeters long - some nudibranch species are however equally colorful and interesting, such as this stunning *Janolus* sp., whose tiny body is completely covered in toxic cerata.