

# Small is beautiful

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Throughout man's pre-history, hunters targeted large animals. But women, who did most of the gathering (remember: we were hunters *and* gatherers!) will not have missed the smaller animals, which will have mightily contributed to our diet. It's the same for the sea: the men go after the big fish (or whatever big fish are still left), and the women gather small animals on reefs. Now what are the small critters that can be collected or live on reefs?

The Western Central Pacific, especially its core, the Coral Triangle, is home to the most diverse fauna of the world. This area holds 50% of the reefs in the entire Indo-West Pacific, made up of over 500 species of coral, with the Coral Triangle hosting 605 zooxanthellate coral species. These corals host a multitude of cryptic

fauna. In addition, 52% of the fish species call the Indo-West Pacific home. The diversity is just as great for invertebrates, which have the highest numbers of cryptic species and are thus not yet well described or studied.

No wonder why, after each dive in Anilao, near Batangas in the Philippines, where we dive regularly, we can safely say that there are at least 20 to 50 fish species we have not observed in our past dives. But it's worth noting that, in our area, there are very few large fish such as groupers, snappers, or jacks of more than about 20cm. Sightings of sea turtles, sharks, tunas and dolphins have become rare indeed over the last 20 years.

Sadly there's been a widespread decrease in the populations of large fish like sharks and tunas and other verte-

brates such as dolphins and turtles from these reefs. But they remain bustling with life, slowly but continuously rebuilding after every disturbance, such as a typhoon. The small cryptic fauna that then recolonize these reefs have very interesting habits, worth stopping for and investigating. Although they live and die by the rule "Eat and be eaten", inhabitants of these reefs form associations that help them survive together through time. Take the example of the small cleaner wrasse, safe from the mouth of a rather large grouper that it 'services.' The grouper glides towards the cleaning station, pectoral fins extended sideways and pelvic fins pointed down, its mouth wide open. This is the signal that it comes in peace, to be cleansed of parasites by the cleaner wrasse. It's a beautiful moment when you chance upon this

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rather common activity on a colourful reef.

Corals and giant clams show the most intimate association. They host within their bodies symbiotic photosynthesizing algae called zooxanthellae, which exude compounds such as sugars that corals and giant clams can absorb to nourish themselves. The colours of these two groups of animals are often enhanced by the presence of zooxanthellae. Bleaching in soft and hard corals, and in some hydroids, can be a result of their zooxanthellae having been expelled. We saw this in the Pacific-wide bleaching of early 2010. In Anilao, we observed sea anemones and hard corals of all forms, though alive, bleached white, even to depths of more than 20m, after they experienced water temperatures as high as 31°C. But corals in shallow coastal areas, most exposed to the elements, felt the greatest impact.

A very common symbiotic association that we see in the shallow reefs of Anilao, and in most reefs in Asia, are sea anemones or sometimes gardens of sea anemones hosting 'herds' of clown fishes, usually dominated by a large female keep-

ing a harem of smaller males. This is a great sight at Caban Cove on Maricaban Island, near Batangas. The sea anemone benefits from the prey that the clown fish attracts into the 'foyer.' The clown fish on the other hand is protected from larger predators by the sea anemone's stings, to which it is immune. Similar foyer/protector partnerships are exhibited by gobies protecting digger or snapping shrimps from predators, while the shrimps dig the burrows seen often on rubble, gravelly or sandy bottoms, between coral mounds or in sea grass beds. The next time you get bored by a vast expanse of sandy bottom, look for the gobies perched at the top of a hole and wait until the shrimp comes out with a heap of sand or gravel, making the hole comfortable for the goby and itself. The goby might actually flick its dorsal fins up and down at you, a sign that it is threatening you because you are threatening it, its partner shrimp and their burrow. Get your camera in position and wait; it will surely be worth it.

The branches and small caves formed by corals protect small fish and inverte-

## On the record

FishBase ([www.fishbase.org](http://www.fishbase.org)) is a global information system on the fishes of the world, both freshwater and marine. It's not just a searchable database. It also provides a host of information for each species of fish, such as

- the list and history of scientific names it has been given
- the vernacular names it has been given in the languages used by the different cultures of the world
- in which locality, country, region and ecosystem it occurs
- what habitat, depth range, temperature and conditions it prefers to live in
- what it normally feeds on and which other animal prefers to feed on it
- how big it can grow and how fast it grows to reach that size, how long it can live, at what size it starts to mate and spawn
- what noise it makes underwater and how its colours change with depth
- and many other interesting facts about its life history, chemistry and capture.

Since its inception in 1989, FishBase has gathered such data for the more than 35,000 fish species so far described or known to science, known by 291,100 common names in more than 260 languages. They're literally all shapes and sizes, from the 0.8cm plainchin dreamarm, *Leptacanthichthys gracilispinis*, an anglerfish, to the 2,000cm whale shark, *Rhincodon typus*.

It also hosts 50,000 fish pictures, extracted from 45,400 published sources with the help of 1,820 collaborators worldwide. FishBase currently receives 33 million hits per month.

The Indo-West Pacific is home to 52% of all fish species

Orange-dashed gobies are found from the Red Sea to Japan, normally in pairs

The twinspace chromis often forms small groups



brates from larger predators passing by. Camouflage is also a common strategy in tropical waters. For example, the ovoviparous pygmy seahorse *Hippocampus denise* is a small seahorse (it is a fish!) measuring up to 2.4cm, which 'hides' in gorgonian corals (usually the species *Annella reticulata*, *Muricella* and *Echinogorgia*) by taking the colour and form of their polyps and branches. This species though apparently widespread in the Western Pacific is not very common and is listed in the IUCN Red List of endangered species. In fact, most seahorses are endangered species, and are often caught as by-catch, notably by shrimp trawl fisheries. FishBase (see sidebar) records 122 species of pipefishes and seahorses (Family *Syngnathidae*) in the Western Central Pacific. The area is home to at least 4,550 marine fish species, according to FishBase, making it one of the highest fish biodiversity hot spots in the world.

Fishes are not the only masters of camouflage in these reefs. Sometimes, if we get lucky, we also chance upon some

funny creatures: an octopus trying to hide in a coconut shell (or even in a bivalve shell!), or a hermit crab in a gastropod shell also colonized by small sea anemones. Some sea urchins cleverly cover themselves with seaweed leaves, coral rubble and sand, while some jellyfishes swim upside down among seaweeds with their short tentacles looking like seaweed fronds. And some simply take the colour or tone of their host, as the minute parasitic gastropod attached to the skin of a blue seastar, *Linckia laevigata*. Frequently, they

also take the colour and tone of whatever they're lying on, like a sea cucumber on a sandy bottom or sea slugs on soft corals.

Small and cryptic seems to be the rule in these reefs. One of the smallest vertebrates in these waters, and indeed the world (see FishBase's ranking of the 10 smallest fishes) is the goby *Trimmatom nanus*. It doesn't have a known common name, but the Latin alludes to its size, with the word 'atom' and 'nanus,' which means dwarf. It is no longer than 1.1cm, and mature females are even smaller. There are more than 2,000 species of gobies in the Indo-Pacific region, and many are still not described and named scientifically. Gobies are hard to spot since they usually take the colour and markings of their habitat, but you can see them darting out of coral or from the sandy bottom.

We should bemoan the loss of so many of the largest denizens of coral reefs, the sharks, the Napoleon wrasses and giant groupers, the giant clams and the lobsters. But their disappearance from most reefs should not prevent us from enjoying the colourful (and productive) life that still exist on most reefs, and which, for the patient observer, can make every dive unforgettable. ▲▲

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Orange anemonefish perch on the protection of their normal home, Merten's anemone