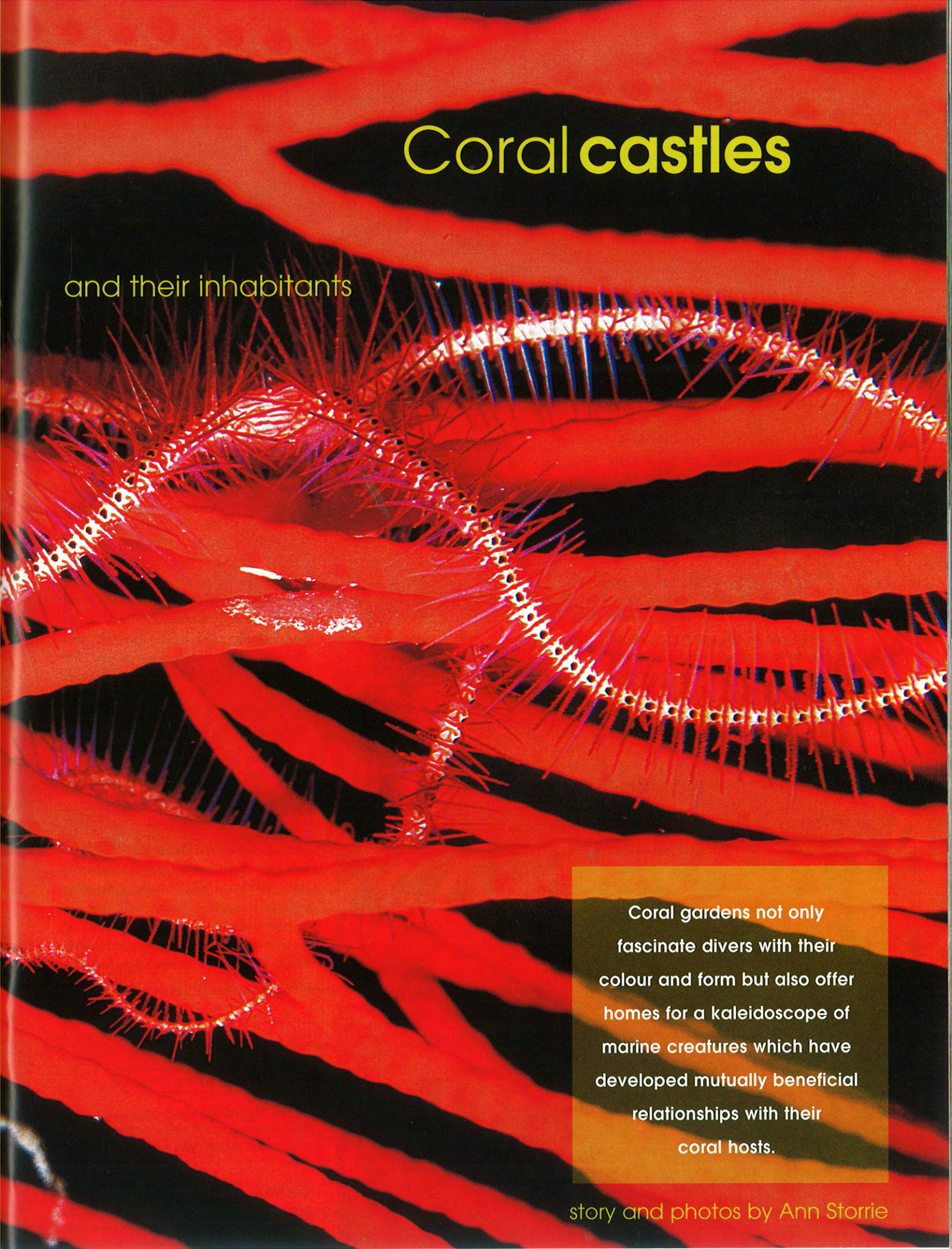


Coral **castles**

and their inhabitants

Coral gardens not only fascinate divers with their colour and form but also offer homes for a kaleidoscope of marine creatures which have developed mutually beneficial relationships with their coral hosts.

story and photos by Ann Storrie

The stinging cells of coral polyps and their cousins, such as hydroids, jellyfish and anemones, keep away many unwanted predators. Some animals, however, have adapted to live either temporarily or permanently among the deadly cells. They may seek protection from their predators by sheltering around the polyps, or the polyps themselves may be a source of food that is unpalatable, or dangerous, to most other animals. The relationships between these ingeniously adapted animals and their hosts are often quite complex. They may be symbiotic where both the host and resident benefit from the relationship, commensal where the host does not benefit but is not damaged by the resident, or the resident may be a parasite that damages the host to some degree.

The wonderful world of sea whips

The common term 'sea whip' usually applies to either gorgonians or black corals that grow as long, slender, whip-like stems that may be either singular or part of a colony. The whips are usually in one plane with few or no branches. Some whips, such as the gorgonian red sea whip (*Ellisella* sp.) grow in colonies that jut out or hang down from vertical walls. Many colourful clumps are found in the Rowley Shoals Marine Park. A torch or flash light is needed to bring out the brilliant red or orange hues of these whips. Single whips of *Junceella* species may grow to two metres in length and range from bright red to pale yellow and white. The spiral wire coral (*Cirrhipathes spiralis*) is a black coral that also grows a couple of metres long and has a corkscrew-like growth form. It is usually a dull orange or lemon yellow colour. Most whips harbour a myriad of marine creatures, some of which are so well camouflaged that divers rarely see them.

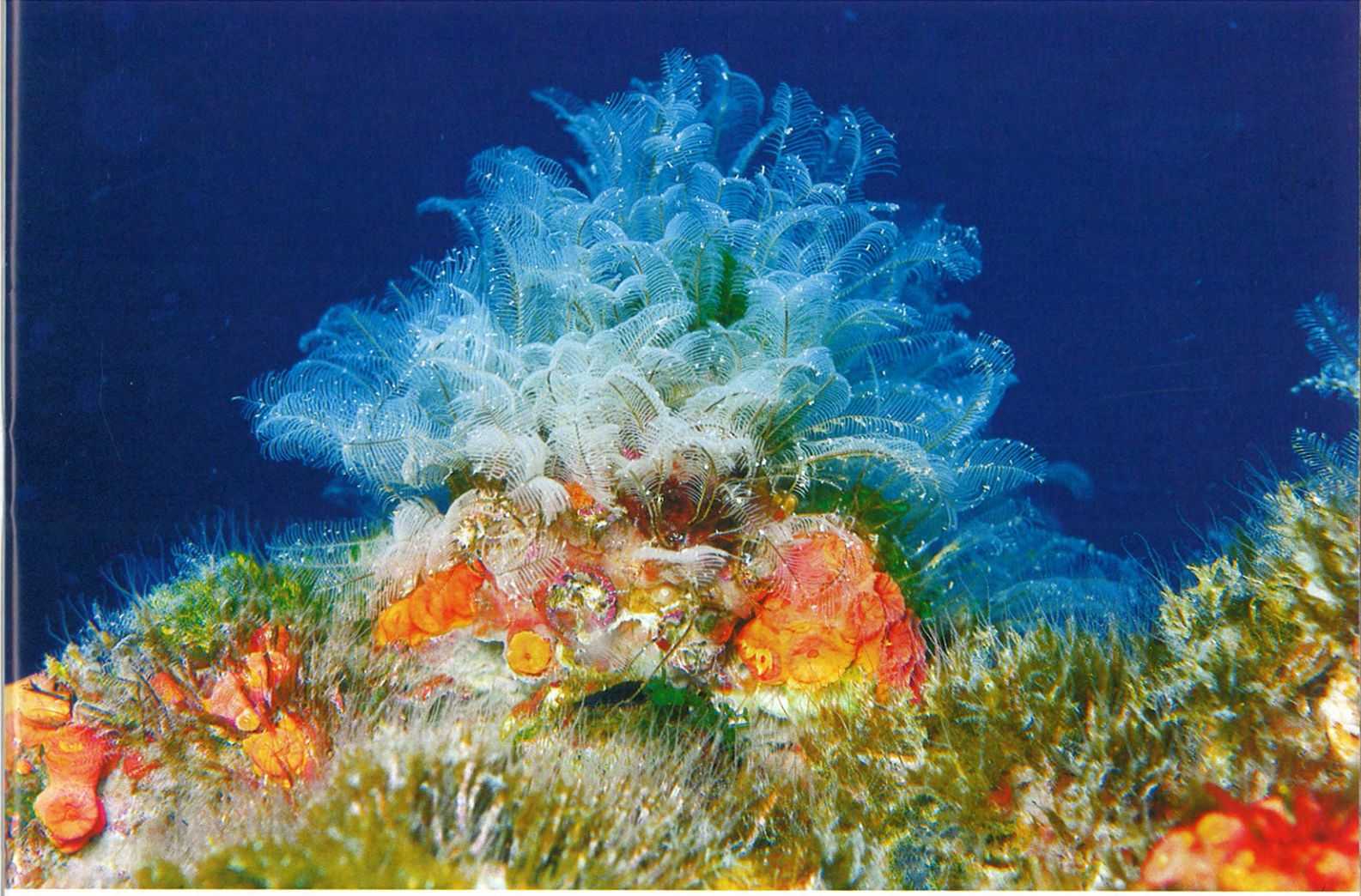
Many elongated fish such as razor fish, flutemouths and pipefish use the whip colonies for protection. Razor fish usually swim in schools with their heads pointed downwards to align themselves with the whips. They seem to bob slowly, but always manage to keep out of camera range on the opposite side of the whip colony. If necessary, they can quickly turn to a horizontal position and shoot off into the distance. Flutemouths and other pipefish also cleverly align themselves along the whips and, at a distance, can be difficult to distinguish from the corals.

Sea whip gobies (*Bryaninops* and *Pleurosicya* spp.) are mainly translucent with colours that vary according to their host sea whip. Some species are only found on black corals, others on wire corals, while others aren't fussy and will happily live on most whips and sea fans. A pair of these cute little fish may claim one large single whip as their territory, aggressively defending it from strangers. Their pelvic fins are joined and modified to form a sort of suction cup which the fish use to stick to the whip in a current. Their fins also enable the fish to flit quickly around

Previous page
Main Brittle star on sea whip coral.

Above Tiny transparent shrimp (*Periclimenes* sp.) are often found on huge black corals that jut out from reef walls.

Left Many gobies live on whip corals and have modified pelvic fins shaped like cups to create suction between the fish and the coral.



Above Hydroids like this look fluffy and soft to touch, but beware of their virulent sting.

the whip and they are often reluctant to hop off and swim, preferring to 'run' up and down the stem. If prey passes close by, however, they whip off their whip for a split second to catch their tasty morsel.

Some rather bizarre shrimps and crabs inhabit sea whips. Most common are the shrimps from genus *Pontonides*. They are often less than 10 millimetres in length and are perfectly camouflaged with body colour patterns that mimic the polyps of their whips. One elongated shrimp, *Tozeuma armatum*, is much larger. It can be several centimetres in length, yet is just as hard to spot as its tiny cousins. It has a long rostrum (nose) about one-third its body length, and its body colour, pattern and shape look like an entire whip strand. It grips a black coral whip with its tiny claws and, when it presses down on the whip, the impression is of a thickened strand of coral.

What may look like an armour-plated shrimp is a tiny spider crab, *Xenocarcinus tuberculatus*. This one rivals any science fiction creature in the weird category. Its carapace has several bumps or spines and its rostrum is long and tapering, though it is only a few millimetres in length. It lives exclusively on black coral whips, often in conjunction with the *Pontonides* shrimps.

Whips are home to many species of allied cowries, or spindle cowries. These beautiful molluscs are elongated to mimic the shape of the whips and some reach five centimetres in length. Amazingly, some species have mantles that have protrusions that mimic the polyps, although often with the wrong number of tentacles for that host. Even more amazing is that, if the polyps on the host whip are retracted, the spindle cowrie can retract its 'polyps' too! How on Earth did it learn to do that? These spindle cowries are all parasites that feed on their host, and large white tracts are often seen on the whips where the molluscs have consumed the polyps.

Larger invertebrates such as crinoids (feather stars), basket stars, anemones and even hydroids perch on whips to take advantage of the height or distance from the reef wall to catch passing plankton. Anemones known as gorgonian wrappers (*Nemanthus* sp.) wrap around the stems, while some brittle stars use the whips for camouflage during the day. If they are of similar colour to the whip they are hard to see when they are aligned, or wrapped tightly around the whip.

Beautiful beasts on black corals

Black corals are famous for their dried, polished, shiny stems that are used to make jewellery. Underwater, they are much prettier. They can be of many colours as the axis is usually surrounded by a thin layer of living tissue. They form whips and wire corals, as mentioned above, or they may be large and bushy, fluffy or spiky, or sea fan and gorgonian-like. They all belong to the family Antipatharia and are characterised by having an internal skeleton of a tough, dark protein called horn. This is covered by minute thorns or prickles and they usually have six, pointed, finger-like tentacles surrounding the mouth of each polyp.

As well as the array of tiny animals that live on the whip-like black corals, an assortment of interesting creatures also inhabits the bushy and fan-like

black corals. Schools of juvenile, and sometimes adult, cardinalfish and damselfish like to swim among their branches. Occasionally, large schools of transparent *Periclimenes* shrimps make their homes within tree-like black corals. An interesting black coral crab, *Quadrella maculosa*, is particularly difficult to photograph, although if you find the small bushy black corals on which they live, you will usually see a pair of crabs in each bush. The crabs have very long front claws, are quite robust and grow to about two centimetres. They are masters of movement among the thick, spiky branches of this coral and rarely sit out from the central stem to pose for photographers.

Although many people associate black corals with the tropics, some of the largest and most magnificent trees grow in our temperate waters. They often grow below 40 metres and many are still undescribed. A regular brittle star inhabitant that lives on black coral has a very apt scientific name, *Astrobrachion adhaerens*. This refers to the way it lives entwined around the black coral's branches. Don't even think of pulling them off as they are adhered extremely tightly.

Sea pen palaces

Sea pens are octocorals (soft corals with eight tentacles around each polyp's mouth) that have adapted to life in soft sediment. They grow in sand or mud and have an above-ground part called a rachis that contains the feeding polyps and a below-ground peduncle that attaches the colony to the substrate. Many are nocturnal in that their rachis retracts underground during the day and only emerges to feed at night. The rachis may be sausage or club-shaped, with polyps arising directly from the stem. Others form feathery quills with leaves of polyps in opposite rows down

Top left Juvenile trevally often seek shelter in stinging tentacles such as these of a large spotted jelly.

Centre left Beautiful egg cowries inhabit large leather corals upon which they feed and lay their eggs.

Left Porcelain crab on a sea pen.

Right Serpent stars, a type of brittle star, wind around branches of black corals.

the stem. Western Australia is blessed with a beautiful array of colourful sea pens from tropical to temperate waters. Diving in the Swan River or Cockburn Sound at night may reveal several amazing species. Many luminesce when touched. If you turn off your torch and gently skim your fingers down the pen, you will see coloured pulses of light radiating along the colony. However, you should check you are not disturbing any of the pen's little inhabitants before you do this.

Many shrimps and crabs inhabit tropical sea pens. Tiny gobies, *Periclimenes* species of shrimps, porcelain crabs and even squat lobsters may be found among the polyps or on the stalk of the pen. One small, translucent, white porcelain crab, *Porcellanella picta*, particularly likes to live in the spaces between the rows of polyp leaves. If you are very lucky, you may find mum (the largest crab), dad and several offspring all sitting in tiers between each sea pen palace leaf.

A large nudibranch, *Armina cygnea*, is common at certain times of the year around Perth waters, especially at Woodman Point and in the Swan River. It delights in consuming the polyps of an orange sea pen, *Cavernularia* sp. Sometimes, all that is left of the unfortunate pen is the thin, central stem that is made up mainly of calcium carbonate.

Leather coral coats

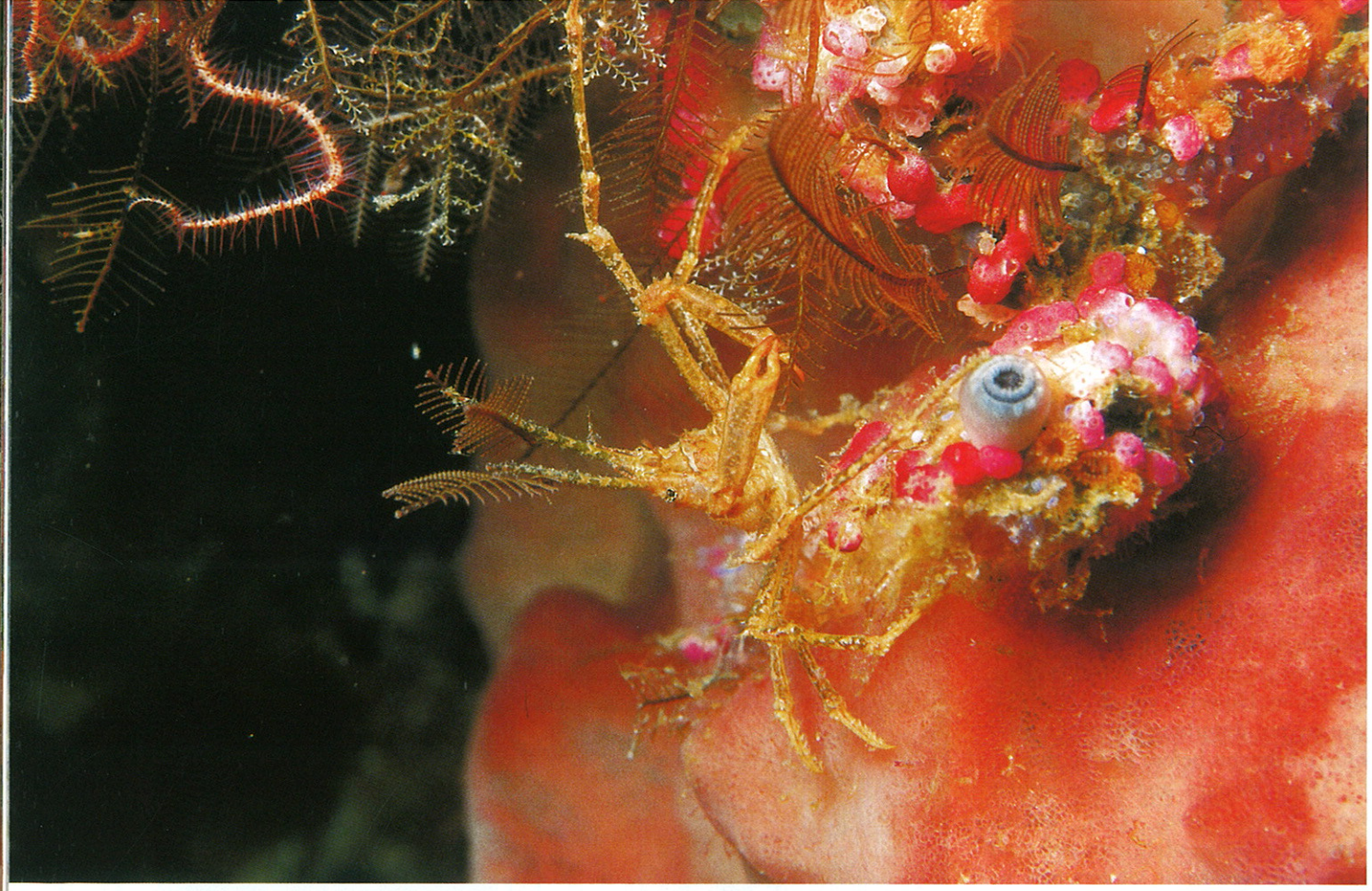
Leather corals are another large group of octocorals, or soft corals, that have a huge number of predators and hosts. Many leather corals encrust or spread over the reef, and can cover tens of square metres. Others are only several centimetres across. Most have a fleshy, leathery feel to them.

If you are ever looking for the spectacular, large, white egg cowrie, *Ovula ovum*, with a jet black mantle studded with white or yellow pustules, look in a mushroom leather coral. *Sarcophyton* species of leather corals are the primary food source for egg cowries. The cowries are often found in pairs, nestled in the folds, or beneath the coral. Several other species of molluscs, including the bizarre, six to seven centimetre-long nudibranch, *Phyllodesmium longicirrum*, also feed on leather corals. This nudibranch may feed on a colony of corals for months, not moving until the colony is mostly consumed. Surprisingly, the nudibranch also gets much of its nutrition from *zooxanthellae* (single-celled algae that can photosynthesise) that live in huge, elongated outgrowths called cerata. Please don't pick up one of these nudibranchs as it may shed its cerata to escape.

Other less destructive animals that often use the leather coral's defences are large sponge crabs from the family Dromiidae. Although often seen carrying sponges, these crabs will frequently pick a piece of leather coral to camouflage themselves. The crabs use their rear legs to hold the coral over their carapace. One of the funniest sights on a night dive is an enormous slab of leather coral trundling along the sea bed. If disturbed, the crab may hunker down under the protection of its coral. If this does not work, it usually takes off as quickly as its remaining legs will allow, coral waving and blundering into the rocky terrain around it!

Hydroid havens

Like corals, hydroids are cnidarians (possessing stinging tentacles around each polyp's central mouth). They



Above This tiny spider, or decorator, crab has planted hydroids on its body, legs and rostrum.

Left Spindle cowrie on back coral.

Below Crinoids (feather stars) often perch on sea whips to obtain a better vantage point to catch passing plankton.

usually live in colonies attached to the substrate. Some species are often mistaken for gorgonians and other sea fans, yet they do not have eight tentacles and they have a jellyfish-like sexual stage known as a hydromedusa. Many hydroids have a very intense, virulent sting that is quite painful to humans. Even so, several species of nudibranchs feed on hydroids, and many creatures live among the fronds of stinging tentacles.

This is where the decorator, or spider crabs, excel. Some species have very long rostrums, sometimes divided into two, and upon which they grow complete fronds of hydroids. They may even grow hydroids over their entire body. These growths are often so well placed that their bodies and the adornments are indistinguishable. This ensures that their camouflage is perfect, unless they get it wrong. Occasionally, you will find a hydroid-coated crab happily grazing among bright red or orange soft corals that bear no resemblance to a hydroid, or the crab.

These are just a handful of the cryptic creatures that live among our corals. Spend a little time under water and you may just find yourself captivated by them.

Ann Storrie is an accomplished underwater photographer and marine enthusiast. She has co-authored and photographed the Department of Environment and Conservation publications *The Turquoise Coast* and *Wonders of Western Waters*. Ann can be contacted by email (naturescapes.au@hotmail.com).

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