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COLLECTING TROPICAL MARINE MOLLUSCS

by

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This paper should be read in conjunction with "Papers for Students" No. 11 - 'Collecting British Marine Molluscs' by Stella M. Turk, F.Z.S., as much that Mrs. Turk has written in her paper applies to collecting in the Tropics as well as in British waters.

This paper will try to concentrate on the differences between shell collecting in the Tropics and in temperate waters. Some of the main points are the heat and the warmth of the water, the kinds of terrain, such as coral reefs, areas of dead corals and mangrove swamps. All these provide habitats for molluscs not present in Britain. Another difference is the infinitely greater number of species which live in tropical waters and the fact that some of them grow to a much greater size than in the colder waters.

Before starting to make a collection of tropical marine shells, it is probably wise to decide the limits of your collection. The number of different species of tropical marine shells throughout the world is so enormous that you would need a great deal of space for storage. A great deal of time and, probably, a good deal of money will be needed if you ever get around to buying shells to help make up your collection. One way is to collect certain chosen families, or at least, limit yourself to gastropods or bivalves. The most popular families are the Cypraeidae (cowries), Conidae, Volutidae, Muricidae, and, to a lesser extent, Strombidae, Olividae and Marginellidae. The fact that these are the most popular species means that it is easier to get hold of literature to determine them and also to buy and exchange if you want to increase your collection in this way. The other alternative is to limit yourself "geographically" and to make as complete a collection as you can of all the shells in one particular area or country.

WHERE TO LOOK FOR MARINE SHELLS

In virtually every kind of marine locality you will find seashells; in sand, in mud, on rocks, in mangrove swamps, deep water, shallow water, among hard coral and soft, there are numbers of one or more of families who make their homes there. Only in shingle are you likely to find nothing at all.

Coral reefs are in many ways the most rewarding, not only because of the large variety of shells and the fact that many of them are particularly attractive, but also because the reefs themselves tend to be so beautiful. The shapes and colours of the coral, the fish and other creatures which live on the reefs and the vegetation are all interesting and make shell collecting a fascinating occupation. The outer edge of a reef is composed of living coral and the inner side as you get nearer the shore tends to have more and more dead coral. Over all of it, you will find shells - Cypraeidae, Conidae, Muricidae, Volutidae, Harpidae, to name only a few; some on the coral, some living deep inside the coral heads and some in the patches of sand you will find among the coral. The outer edge of the reef and the live coral is always under water and you will have to do most of your collecting there using a snorkel or an aqualung. When the tide is low, you can usually cover much of the inside of a reef on foot. Often there are large sandy stretches between the inner side of the reef and the shoreline where you will find many sand dwellers - Bivalvia, Olividae, Terebridae, Cerithiidae, Naticidae. Often on these sandy stretches you will find clumps of coral isolated from the main reef but usually well stocked with shells. Among the corals, you will find that the soft corals and gorgonias have their own shells, such as some of the cowries and members of the allied cowry groups, Ovulidae and Triviidae.

On rocky shores, collecting is perhaps easiest as many rock dwellers live in shallow waters or spend much time above mean tide level. Some of the cowries, Neritidae, Turbinidae, Trochidae, as well as the Haliotidae (abalones) and the Acmaeidae and Fissurellidae among others are all rock dwellers, and are not too difficult to find. Turning over rocks or lumps of dead coral will soon have your collecting bags filling up. It is important to remember, however, that many creatures lay their eggs in crevices and underneath rocks and corals. So after you have turned over a piece of rock or coral and looked for your shells, you should always turn it back again so that the eggs and creatures you have left behind are protected as they were before and not left to die of exposure or to be eaten by some predatory creature.

As I mentioned above, many bivalves as well as Olividae, Cerithiidae, Naticidae, Terebridae, some of the Conidae, Mitridae and Volutidae live in the sand. Some of these you can find by looking for their trails which look as if somebody has run his finger along the sand. If you take a handful of sand from one end or other of the trail, you will be delighted at how often you find you have added to your collection. Some families are more active at night time and using an underwater torch can yield good results. Patches of sand in the middle of corals and underneath rocks are also worth investigating. When you turn over a rock, fan away the sand with your hand or your flippers, and you will sometimes find shells,

especially cones, a little below the surface. Patches of eel-grass are well worth exploring carefully. This is a favourite haunt of a number of shells. As well as eel-grass, the patches of seaweed on the reefs are also the homes of a number of shells, especially Lambis spp. (the Spider Conchs).

Mangrove swamps have their own flora and though far from ideal places in which to collect should not be forgotten. Forms of Littorina scabra live on leaves of the mangrove tree high above the water and are coloured yellow, orange, red, etc. and in the blackish water and mud below you will find Ellobiidae and Melongenidae and a host of species of Cerithiidae.

In parts of the Tropics fish traps are made of long poles which hold up a wire net with a circular enclosure at the end (the kelong of South-East Asia). A rich growth of marine vegetation soon covers the poles below the water line and this harbours a wide variety of life including molluscs, some of the cowries especially.

HOW TO COLLECT

Decide, as I have suggested, how you are going to limit your collecti as early as possible and then you will have to work out your own way of going about it depending on where you are and the time you have to spare. You can start and make quite a reasonable collection with very little equipment as a great many shells live in shallow water and you can later progress by using flippers, snorkel and goggles and later on an aqualung. The latter will enable you to get into deep water and stay down for longer periods.

It is wise where you can, to collect your shells alive as, once they are dead, they soon begin to bleach and to get chipped and broken by wave action. However, you should not despise dead shells completely, as some of the rarer ones you may only find in this condition. Particularly, after a storm you have a good chance of finding worthwhile specimens washed up among the vegetable debris on the tide lines and which are still in good condition.

EQUIPMENT

If you are on foot, remember that the tropical sun is very hot and it is only too easy in the enthusiasm of pottering about on a reef to get ver badly sunburned. A long-sleeved shirt and trousers should be worn, unles you are quite sure how much sun you can take. It is also essential to wear something on your feet; canvas ankle boots (tropical 'foot-ball') ar ideal, for avoiding coral scratches. Your boots must be well tied when walking among the mangroves or the mud will suck them off to your considerable discomfort! When you are working in areas of coral or barnacle-covered rocks, strong cotton or string gloves are better than rubber, which is so easily cut. You will also find helpful a thin iron bar with a hook to help you turn over loose rocks and coral.

For your collecting, especially when you are working in more than 2 feet of water, you want a strong cloth bag or one with fine mesh which

must close completely at the top either with a drawstring or a strong zip, otherwise you may one day find to your chagrin that a prize specimen has managed to find its way out of your bag. It is helpful to attach this bag to your waist with a broad belt which will not cut into your skin as your bag gets heavier, and it must be big enough to hold large specimens; 12" x 9" is a useful size. A few small jars with clip or screw-on tops, preferably plastic, for preserving small delicate finds are a help. If you want to preserve some of your specimens alive for observation when you get home, don't forget something in which to bring back sea water as well. When working in mangrove swamps insect repellent can be a boon. If you are likely to collect chitons, some of which can be up to 4" long, you will need some flat sticks of wood between which they must be kept and some strong thin twine to keep them from curling up.

If you are going to swim use a snorkel and flippers and remember the long sleeved shirt and trousers (an old pair of pyjama trousers are ideal). This will not only save you from the sun (and swimming along the surface with your goggles underwater, your back and the back of your legs are extremely vulnerable to sunburn), but also give you some protection from cuts and scratches from coral and so on and from some of the stinging vegetation and marine life - jelly fish and so on. You will also need gloves, a collecting bag, a knife (helpful for collecting Haliotis and limpets) and you may feel happier with a shark spear or a strong pointed metal rod which could at least give you some feeling of security if an inquisitive shark got too close. You may never have to use it but you can hang one from your belt without it getting in the way.

Remember that underwater you can easily turn over rocks and lumps of coral which would be impossible to lift on dry land, but again don't forget to return them to their original position after you have finished searching.

When you go further and start to use an aqualung you will find that your range is greatly extended. The advantage of being able to stay under water and search thoroughly even in very shallow depths is an enormous help. Using an aqualung, however, is not something that should be done unless you are quite sure of what you are doing. There are plenty of good books on the subject and you should be properly trained before you start.

Some of the carnivorous species of Mollusca such as the large Olividae and Muricidae can be caught in baited traps and even on baited lines left over-night. On sandy beaches and the shore where the water is receding many bivalves are likely to be active and can be collected by dragging along a simple clam rake. (Other sand dwellers such as Terebridae can best be collected when they appear for a moment out of the sand behind the surf of a receding wave.)

CLEANING

When you have collected your live shells, the problem of cleaning them is a major one. In the tropics, the soft parts of the animal begin to decompose very quickly and begin to stink! The easiest way is to bury your shells in clean sand for about three weeks and let the ants do the cleaning for you. When you take them out of the sand you can wash the remains out

of the shells with a strong jet of water, but be careful not to bury them one above the other as the disintegrating animal will seep through the sand and spoil the good shells underneath.

If you have no co-operative ants handy, you can boil the shells and then extract the animal. One is chary of doing this with cowries in case the glaze is spoiled, though some people say it can be done without harm. Certain very delicate species can be boiled by placing in cold water and bringing slowly to the boil, then simmering for a few minutes.

Tempered wires of varying thicknesses, set into hand-grips, some straight others curved or hooked according to the shapes of the shells to be dealt with will be found very useful. For example, with cones, a straight wire inserted firmly as far back around the body whorl as possible, twisted slowly but firml till the foot emerges, will often suffice. Very strong wire will be needed for a large specimen of species such as leopardus, litteratus and betulinus. Olives can be treated in the same way. Turbo, Trochus, etc. will need curved wires with a small hook at the tip. After their shells have been taken from the water, some molluscs retreat deep into their shell, others such as the strombs extrude themselves and after 24 hours can often be pulled gently from their shell.

Very large species such as Cassis cornuta or Charonia tritonis can be cleaned by tying the foot of the animal with a string and hanging it above a bed of something soft (from a tree or bush above sand). The animal will eventually relinquish the shell and let it fall.

The soft parts of cowries decompose very quickly and if you lie the shell's aperture downwards on thick layers of newspaper or tissue, wash each day, flush inside and replace on the paper, after a few days the whole animal can be shaken out into a bucket of water. This is a smelly job but does not take too long. For the specimens difficult to clean when the animal does not come out whole, the large Terebridae, Trochidae and Mitridae for example, the visceral parts tend to break off and lie in the apex of the shell. A strong syringe such as dentists use can be helpful in dislodging these remains Otherwise, one can only hold the shell underwater till it is free of all air, shake and leave, then repeat daily rinsing and flushing and putting in clean water until all the animal is removed.

The deposits of lime and sea growth can only be removed with care and hard work. The small picks which dentists use are ideal.

Since the periostracum - the "skin" on the outer surface of many shells, specially the cones - is part of the animal scientific collectors will wish t retain it, but in many tropical species it is so thick that the shell pattern and colour cannot be seen through it. You may well wish to have specimens with and without. To remove the periostracum, put the shells in a strong solution of common household bleach for about 24 hours and then wash thoroughly in clean water.

The operculum, the "trap door" which many shells possess - the cat's eye of the turban shells in particular - should also be preserved and kept with the shell. A good way of doing this is to stick it to a piece of cotton wool which can be pushed into the shell to hold it in place.

When you have to transport your shells before you can clean them completely, remove as much of the animal as you can, pack the aperture tightly with absorbent tissue (soft toilet paper is ideal) and put the shells in screw-top jars or in several layers of well-tied holeless polythene bags. If weight is no problem you can pack them in bags of sand and you will not be troubled by the smell.

DATA

Remember what Mrs. Turk says in her paper on pages 6 and 7 about data. Your shells will have little or no scientific value unless they are accompani by data showing when and where they were collected, in what sort of habitat, depth and so on - the more detail the better. It is also helpful to record whether they were abundant, common, uncommon, rare, etc. when and where you found them.

You can keep this record on a piece of paper, tucked into the shell when you have cleaned it, but sometimes the paper gets lost and your record spoiled. A more certain way to keep your data is to number your shells and keep the details in a note book under the reference number.

DANGERS

The tropical seas are certainly not lacking in a variety of creatures which can be dangerous. Obviously the shark is one, but apart from him there are other fish such as the barracuda and also the stone-fish. This latter is rather a flattish fish, mottled grey-brown and white with very frilly fins which lies among stones and coral debris and is apt to rely on his camouflage. You may actually get very close to him before he swims away. He has a row of sharp spines down the middle of his back and a prick from one of these will give you a very nasty sting indeed and probably land you in hospital. So beware of him.

The moray eel is another nasty customer and you should be circumspect before reaching inside dark crevices among rocks underwater. He has a vicious bite and will hang on very firmly. I suggest that it is wise to carry a good knife or a pointed metal stick about a couple of feet long in case of trouble.

Among the molluscs themselves, there are one or two which can sting you very badly, the worst being Conus geographus, whose sting is known to have been fatal. The Conus marmoreus and Conus textile groups can also give you a bad sting. When picking up any of these, you should always do so by the broad end as the sting is in the front (narrow) end of the animal. Having collected them alive, make sure you put them in a container through which they are unable to sting you; if you put them in your shirt pocket, for example, they can easily sting through the material.

In many places in the tropics you will find sea urchins. The black urchin has very long brittle spines and it is only too easy to get short pieces of these stuck in your hands and feet. These pieces will dissolve in the flesh within a day or two and need no treatment beyond the applicatio of vinegar to the surrounding skin - this hastens the process. Since they are minutely barbed it is almost impossible to pull them out. The grey

or brown urchins have thick short spines and these must be extracted or they will fester.

You may also come across sea snakes which are common in some waters such as around Penang. The bites of all sea snakes are poisonous and they should be avoided without reservation. Sting rays are also a danger as when they rest under a thin layer of sand they are difficult to see and you can tread on one, and if stung, land in hospital. This is another good reason for wearing shoes which cover the ankles. Don't forget also that a number of sea "plants" and corals, especially at greater depths, can give you painful stings.

On the reefs in open water, dead coral below the living surface coral can decay and erode, leaving dangerous pockets and hollows beneath the crust which may give way beneath one's weight. A plunge perhaps knee- or thigh-deep into such a hole can give one painful gashes which are liable to become septic and may take months to heal. Wounds in the tropics tend to take far longer to heal than in temperate climes. On the reef, therefore, test each step. (This is also another good reason for wearing trousers.)

Finally, don't forget that tropical storms and squalls can at times blow up out of a clear blue sky in a matter of minutes. When shelling around the reefs or rocks in a small boat, always keep a weather eye on the sky. Never be caught with an outboard motor which won't start - and no paddle.

HELPFUL BOOKS FOR THE BEGINNER

The pocket book "Seashells of the World" published by Paul Hamlin in London is a very helpful little book. It has nearly 800 illustrations in colour and is easy to carry around.

"How to collect Shells" published by the American Malacological Union, Buffalo Museum of Science, Buffalo 11, New York, U.S.A.

"Helpful hints for Shell Collectors" - Hawaiian Malacological Society, 2777 Kalakaua Avenue, Honolulu, Hawaii, U.S.A.

Though a little old fashioned and not in colour, you would also find "Handbook for Shell Collectors" by W.F. Webb and published in the U.S.A. a very helpful book as it contains a very large number of photographs and drawings.

There are of course many other books dealing with particular families or particular areas.

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