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Read any good comic strips lately? A recent S.M.H. 'Frontiers of Science' strip featured THE DIVING REFLEX.

Puzzled by the ability of some air-breathing mammals, such as seals and walruses, to stay under water for up to half an hour, biologists began experimenting and found that when a seal was immersed in water immediate and striking physiological adjustments took place. The heart beat dropped from 80 per minute to 12 and blood vessels in the tail and flippers virtually shut down - both of which conserve the oxygen in the bloodstream.

They find too, that man exhibits these same signs of the Diving Reflex, lowered heart beat, constricted blood vessels and metabolic changes in the blood.

This, then, is yet another link in the chain of proof that man had his beginning in the sea, and poses further questions yet to be answered.

does this apply to SCUBA divers or like the seal is the mechanism which triggers the reflex coupled to the nose, which in the diver is kept dry by the faceplate?

If any reader has more comprehensive information on this subject, the Bulletin would be pleased to receive it. However, Group members are cautioned against haphazard experimentation as this reflex can be involuntary even out of water and can result in ventricular fibrillation or cardiac arrest.

Editor

FISHES OF SHIPROCK

C.J. Lawler

In recent months we have been writing much about the huge variety of invertebrate life at Shiprock. But they are only one aspect of this amazing place, most visitors are impressed with the large and varied amount of fish living and passing through the area.

All types of fish are to be found in the vicinity from large pelagic kingfish to tiny reef dwelling chaetodons. Inhabiting the reefs and vertical faces you will find several species of leather jacket and trigger fish, cowfish and boxfish, surgeon fish, talma chaetodons, red mowongs, old wives and even the occasional blue groper. Meanwhile in the crevices of the reef lurk roughies and bullseyes, white ears, large and small, frogfish and more rarely the deep water knight fish.

Darting in and out amongst the Telesto and Bryozoan growths are tiny rainbow fish and hawk fish, baby demoiselles and hulas. Bottom dwellers include flathead, goatfish, sole, maybe an angler fish and the too numerous electric ray or numbfish. Swooping through the body of the water are the big impressive schools of kingfish, mullo way, pike, whiting and blackfish with an occasional drifting john dory or snapper; while in the upper levels writhing schools of striped catfish ooze their disgusting way around boulders and clefts.

As well as the lists of invertebrates being prepared I am sure a list of the common and exotic fish being found at Shiprock needs compiling. We hope to be able to make a start on this in the near future. Illustrated are some of the more rare species that have been collected or sighted at Shiprock.

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SOME RARE FISH FROM SHIPROCK

on this page are

5 hand drawn illustrations of the following fish;

1	BUTTERFLY COD	<i>Pterois volitans</i>
2	SHINING PULLER	<i>Chromis nitidus</i>
3	THREADFIN CHAETODIN	<i>Chaetodon auriga</i>
4	KNIGHT FISH	<i>Cleipodus gloriamaris</i>
5	GUNTHERS RAINBOW FISH	<i>Pseudolabrus guntheri</i>

1....Two of the beautiful but venomous butterfly cod or lion fish have been seen at Shiprock and both are now surviving very well in Frank Davis' aquarium. Other common names for this fish are zebra fish, turkey fish or fire fish. Colour is reddish brown and white vertical stripes, spotted on the soft fins. The dorsal spines are long and needle like and are charged with venom, being able to inflict a painful sting. This fish belongs to the same order (cataphracti) as the stonefish, flathead and fortesque, all venomous fish to greater or lesser degree. The lion fish grows to about 15" in favourable localities, but local specimens are very small. It occurs all over the indo-pacific region and in recent years it has been found at certain spots around Sydney, but is by no means common this far south.

2....The shining puller is closely related to the demoiselles (of which the white ear is our most common species), anemone fish and chaetodons. Only one of the species illustrated has been captured at Shiprock, very few having been seen. The colour of this little fish is most attractive, being a very bright yellow on the dorsal surface above a brownish line extending from the mouth through the eye to the juncture of the first and second dorsal fins. Below this line the body is silvery. The tail is forked and together with the second dorsal and ventral fins is bordered with black rays. This fish is not common in N.S.W.

3....The threadfin chaetodon is rather rare, only one has been found so far, at Dolans Bay wharf some 200 yards from Shiprock proper. Colour is golden-yellow on the second dorsal, caudal and bordering the ventral fins, a black ocellus or spot on the second dorsal and a black band vertically through the eye. The body colour is silvery-grey with purplish cross striping. Chaetodond comprise some of the most beautiful and exotic fish inhabiting our northern coral reefs and have become almost synonymous with tropical waters. The talma or truncate coral fish (*C. truncatus*) is our only southern chaetodon and several large specimens can be found at Shiprock.

4....The knight fish has many common names, coat of mail, pineapple, port and starboard light, pine cone being some of them. It is rather a weird fish with its shining, armoured appearance, black mouth and luminescent red spots on the chin. The first dorsal and ventral fins take the form of strong, sharp spikes that can be locked in an outward-pointing position and each large scale bears a backward-pointing spine. The overall colour is a shining silvery-gold with each scale bordered with black. Several of these fish had been seen in caves at Shiprock in mid 1965 but none have been seen lately.

5....A very agile fish that darts quickly in and out of Telesto or Bryozoan cover is Gunthers rainbow fish and many can be seen at Shiprock. It is a member of the labridae family which includes wrasses, parrot fish, maoris and banana fish. Colour is brownish-orange longitudinal stripes on a pale, apple green ground. The dorsal fin has reddish tips and a dark spot towards the front end. About five bands of purplish spots appear down the back ending on the peduncle of the tail grows to about 4 to 5 inches.

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Hints for Collectors: FISHES

from The Australian Museum Leaflet.

Collecting:

The collector should obtain at least one specimen of every species of fish he encounters, nomatter how common it appears to be. Showy or large fishes are generally of less scientific importance than small, inconspicuously coloured forms. Series of specimens showing the changes which occur with growth are particularly desirable, as also are any freshwater fishes. Apart from ordinary fishing methods, inspection of markets and the contents of incoming fishing-boats often produces good results. Beaches should be scanned for stranded specimens, while clumps of coral, large sponges, other marine growths broken up and boulders overturned between tide-marks are fruitful sources of material.

Overtured boulders should always be replaced in their original positions. Provided no legal restrictions forbid, fishes in rock pools may be poisoned by mixing chloride of lime with the water. Dredges, trawls and tow-nets are invaluable for marine collecting.

Notes on the food or habits of fishes are always useful, and the life colours of their various parts should be carefully noted, or, better, a coloured photograph or drawing made. Any parasites or embryological specimens found in fishes should be preserved, with labels explaining the circumstances under which they were obtained. The gills, integument, and internal organs of fishes are often parasitised by worms, crustaces, etc.

Preservation:

Fishes may be fixed by placing them in a solution of formalin prepared by dissolving commercial formalin in fresh or sea water in the proportion of eight fluid ounces of formalin to one gallon of water, roughly twenty parts of water to one of formalin. They may be left in formalin for months, but should not be preserved in it indefinitely, as the bones, spines and scales become soft. spirits of wine (seventy-five per cent alcohol) is the best premanent preservative known, being superior to methylated spirits. Fixatives and preservatives should always be kept in air-tight receptacles; milk-cans are useful for larger specimens and bottles or glass or plastic tubes for smaller ones.

When possible, fishes should be dropped alive into formalin, as they then quickly die with fins extended. Those which have been dead for some time before being collected should be washed and soaked in water until the fin-membranes may be extended and the tissues lose most of their shrivelled appearance. A slit in one side of the body of larger specimens should be made, so that the internal organs may be reached by the preservative, or formalin should be injected with a syringe through the anus. After fixing in this manner, each fish should be wrapped in muslin for protection with a strong paper label on which its name, place and date of capture and collector's name should be noted in Indian ink or soft lead pencil. Tin labels stamped with numbers may be sewn or tied securely to the specimens, and data concerning them entered in a notebook against corresponding numbers. Large and small fishes should be kept apart as much as possible, while specimens should never be crowded into a bottle or can. They may be consigned (packed in plenty of rags which have been soaked in preservative to keep them moist) in an air-tight tin, such as a soldered kerosine tin, or in a sealed plastic bag.

If spirits or formalin cannot be obtained, strong brine, with a little alum added, can be used for pickling fishes. They should be left to soak for several days before being packed for transit. Or the fish may be covered with a heap of ordinary salt, care being taken to fill the mouth and gills as well as the interior of the body with plenty of salt. after some hours, or by the next day at the latest, the specimen should be turned over, drained and packed in fresh salt. The process should be repeated until the fish is dry, when it can be packed in a box with salt as packing. Fishes may also be kept for a time by being frozen in ice, packed in a mixture of ice and salt, or stored in a refrigerator.

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FORTHCOMING GROUP OUTINGS

The April Group dive will be on Sunday, April 24th at Shiprock. Meeting time is 9:30 a.m. to allow a dive about 1/2 an hour each side of the peak flood tide at 10:30 a.m. This had been found to provide maximum visibility with negligible tidal current.

This area provides optimum diving conditions for both inexperienced and experienced divers with rock plateaus at 15' and 40' as well as a small area at about 60'.

As you will recall from earlier bulletins, the area contains more diverse specimens of marine life than any other single area visited by Group divers and a number of divers familiar with the area will be on hand to act as guides or 'buddies' to interested divers. For further information of details or arrangements contact Clarrie Lawler Ph 579.1435.

As well as these monthly Group dives, many members dive every week (usually Sunday mornings) in smaller sub-groups in such areas as Fairlight, Bare Island, Glaiser Point.

All members are invited to take part in these weekly dives for, as it will be appreciated, one dive each 30 days is inadequate to maintain familiarity and confidence in both one's equipment and oneself.

For details of these weekly dives the two sub-groups to contact are Col Trounce Ph. 524 8522 and Clarrie Lawler Ph 579 1435.

Another Group activity is the Diving School conducted at regular intervals by David Landor - these classes are arranged when a suitable number of applicants is available. For more information on these classes contact D. Landor Ph. 42 5986.

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