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Observations on the Use of the Sucking-fish or Remora,  
*Echeneis naucrates*, for Catching Turtles in  
Cuban and Colombian Waters

By C. RALPH DE SOLA

## INTRODUCTION

IN reading several interesting papers of Dr. E. W. Gudger (1919), that indefatigable research worker in the bibliography of ichthyology, my attention was arrested by the title and contents of a brochure "On the Use of the Sucking-fish for Catching Fish and Turtles." In some fifty pages and with less than a dozen illustrations he has skillfully demonstrated and proven the story of the use man found for the sucking-fish. He states that the custom of using the remora for fishing was first observed by Columbus (1494) on his second voyage to America, in an island group of the West Indies called the Jardinelas de la Reina.

In conversation with Dr. Gudger I told him of similar observations by myself and others in Cuban waters, and of those of my father, Dr. Solomon De Sola, off the north coast of Colombia. At Dr. Gudger's instigation I relate these experiences, offer some extensions to his paper and comment on the writings of other authors who have treated upon this subject of remora fishing.

## REMORA FISHING LOCATIONS OTHER THAN CUBAN

It is interesting to discover in Gudger's paper that remora fishing is not confined to Cuban waters but occurs in many parts of the world. These localities are summarized:

*Africa*: Isle de France (Mauritius), Zanzibar, and east coast of continent from Mozambique to Natal and including the island of Madagascar. From the 5th to the 30th parallel of south latitude and from 30 to 60 degrees east longitude.

*Asia*: along the South China Sea and the locale of Singapore. From the Equator to 20 degrees north latitude and in 105 degrees east longitude.

*Australia*: in the vicinity of North Queensland at Cape York, Torres Straits (between Queensland and New Guinea), Dunk Island (tropical Queensland), and Prince of Wales Island at the north-east extremity of the Gulf of Carpentaria. From 8 to 10 degrees in the south latitudes and in the 140th degree of east longitude.

*South America and West Indies*: off La Guayra, Venezuela, and at Puerto Colombia, Colombia. In Cuba, Haiti and Jamaica. From the 10th to the 25th parallel of north latitude and from the 65th to the 85th degree of west longitude.

Obviously it is the work of the ethnologist to determine the origin of this peculiar custom having such cosmopolitan range, for until further researches have been made it would be foolhardy to state that the custom was an invention of the American aborigines and of a pre-Columbian date only in the New World.

## REMORA FISHING IN THE JARDINELLAS DE LA REINA

Gudger gives considerable space to tracing accounts by Spanish historians who recorded the incident of remora fishing seen by Columbus in the

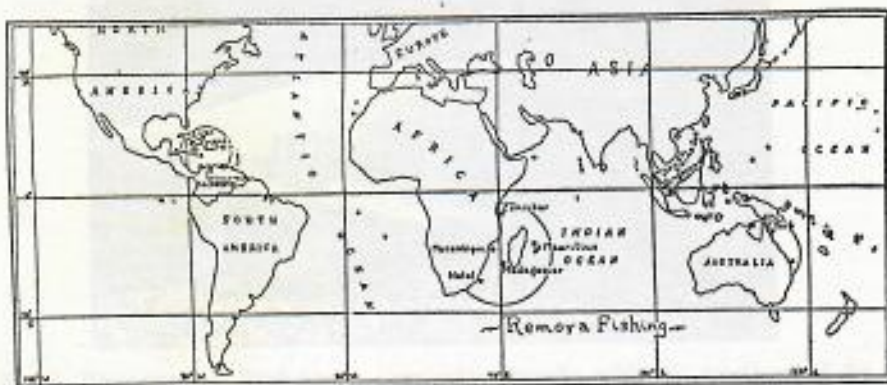


Fig. 1. Outline map of World on mercator projection, showing localities where remora fishing is practised, indicated by black dots.

Jardinellas de la Reina. All these accounts appear to be repetitions of Peter Martyr. MacNutt's excellent translation of his "Decades" follows:

Everybody has assured me that they have seen fishermen use this fish just as commonly as we chase hares with French dogs, or pursue the wild deer with Molossians. They say that this fish makes good eating. It is shaped like an eel, and is no larger. It attacks fish larger than itself, or turtles larger than a shield; it resembles a weasel seizing a pigeon or still larger animal by its throat, and never leaving go until it is dead. Fishermen tie this fish to the side of their barque, for it must not be exposed to the bright sun, from which it shrinks.

The most extraordinary thing is that it has at the back of its head a sort of very tough pocket. As soon as the fisherman sees any fish swimming near the barque, he gives the signal for attack and lets go the little cord. Like a dog freed from its leash, the fish descends on its prey and turning its head throws the skin pouch over the neck of the victim, if it is a large fish. On the contrary, if it is a turtle, the fish attaches itself to the place where the turtle protrudes from its shell, and never lets go till the fisherman pulls it with a little cord to the side of the barque... If, on the contrary, a turtle has been caught, the fishermen spring into the sea and raise the animal on their shoulders to within reach of their companions. When the prey is in the barque, the hunting-fish returns to its place and never moves, save when they give it a piece of the animal, just as one gives a bit of quail to a falcon... The Spaniards call this fish *Reverso*, meaning one who turns around, because it is when turning that it attacks and seizes the prey with its pocket-shaped skin.

#### LOCATION OF ISLES DESCRIBED BY COLUMBUS

A point in question has been the location of the *Jardinellas de la Reina* and *Gudger* in quoting the Spanish historian Bernaldez (MS ante 1500) writes:

The Admiral set sail (from Jamaica) with his three caravels, and sailed 24 leagues towards the west, as far as the Gulf Buen Tiemps... Whitsunday, 1494.

A glance at any chart of the West Indian region leaves one with the impression that from the foregoing account Columbus arrived twenty-four leagues to the west of Jamaica and when this route is checked with dividers and parallel rulers one finds a spot in the Caribbean Sea far distant from any islands. Making allowances for the discrepancies of navigation as known to Columbus, and taking into account that his maps were, at best, his own rough sketches of unmapped territory, and that he had no knowledge of the local magnetic variations or even the deviations aboard



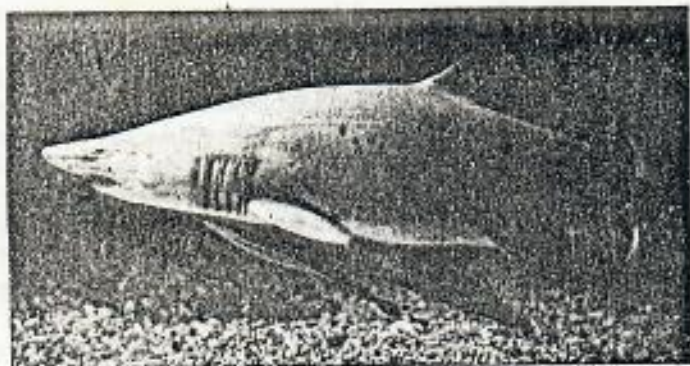


Fig. 3. Photograph of Sand Shark, *Carcharias littoralis*, with two specimens of the Remora, *Echeneis naucrates*, attached. The specimens reveal two distinct color phases. These fish are capable of eight color phases according to Townsend.

#### REMORA FISHING IN THE JARDINELLAS DE LA REINA TODAY

Gudger traces accounts to the present day and states that for the West Indian region remora fishing has not been recorded since 1885 when Lady Anne Brassey wrote of her observations on the coast of Venezuela. In reference to the first noted site of such fishing operations, the Jardinellas de la Reina, he emphatically states:

...hence we may safely conclude that the Jardinellas de la Reina no longer witness the exploits of the fisherman fish.

The writer presents findings that would seem to refute Dr. Gudger's statement. While in the region of these celebrated islands, Raoul A. Bertot, the American Consular Agent at Manzanillo, a Cuban port sixty-five miles from the Jardinellas de la Reina, informed me that people of these islands practiced this custom to a considerable extent and that it was particularly employed by the Siboneyes (people of Carib extraction), who did a great deal of hawk's-bill turtle fishing. This turtle is *Eretmochelys imbricata*, the one that yields the tortoise shell of commerce. In respect to the Siboney people, de la Torre records:

Descendants of the Siboney and some of them almost racially unmixed are found in Jiguani and Palma Soriano [these points are on the Cuban Railroad between Santiago and Manzanillo], Yateras [near Guantanamo Bay], el Cancey [near Santiago], and Baracoa [near Cape Maysi on the northeast coast].

In conversation with Dr. de la Torre of the Havana University, who is the acknowledged dean of Hispanic naturalists, I was told that fishing with the remora was a hand-me-down from the Carib people and was widely practised in regions of Cuba where their descendants were to be found. The scarcity of accounts from this region is probably due to the decimation of these native fisherfolk, as the majority of Cubans are not a water loving race; in fact, all shipping is handled, operated and manned by Spanish sailors from Galicia.

#### REMORA FISHING LOCATIONS IN CUBA

##### Ports in Oriente Province

Manzanillo: In this port I did not have time to observe the use of the

remora but the American Consular Agent, Raoul A. Bertot, gave me information already used.

Ensenada de Mora (Pilon): Charles Mason, sub-manager of the Cape Cruz Sugar Company, informed me that fisherman on Hicacos Point used the remora as their fish-hook.

Santiago de Cuba: Emilio Portuondo, a local naturalist, told me of the strange custom and showed me a picture he had sketched depicting the fishing operation.

Guantanamo Bay (Caimanera): Here I was invited to go on a fishing party but time did not permit witnessing the exploits of echeneis. The fishermen had a pair of sucking-fish secured under the stern of their row boat. The echeneis were attached with layards secured to the caudal region of their bodies and made fast to the stern ring of the boat. The fish attached themselves with their cephalic sucking discs, to the under planking.

Nipe Bay (Antilla): George Curtis of the United Fruit Company told me of the custom and showed me the fish that fished. The specimens (*E. naucrates*) were alive and tethered by their tails to a fishing jetty.

#### Province of Matanzas

Matanzas: See following account.

#### OBSERVATIONS ON REMORA FISHING AT MATANZAS, CUBA

On Sunday, April 14, 1929, it was my pleasure to go on a fishing trip for sea turtles with the American Vice-Consul, Mr. Warren C. Stewart, and a party of Cuban friends. We set out from the *marina* at daybreak and motorboated from Matanzas Bay to a village between that point and Cardenas. Here we got into several small carvel type row boats and went out off the sandy beaches with native crews. Along the lower side of the craft a pair of *pega-pegas* or *pegadores* (as sucking-fish are called in Cuba, meaning stickers) were firmly attached by their discs to the planking. A thin lanyard of *majagua* bark made them secure to the boat. This *majagua* bark is a pliable, long-fibred liana, which admirably lends itself to primitive rope making. In other parts of Cuba I saw it used as a lasso in the capture of crocodiles.

Once clear of the sandy shoal water we sighted a sea turtle basking on the surface. Our boatman immediately headed in its direction and gave us instructions to fasten the *majagua* lanyards that held the remoras to a coil of rope that was faked down in the bow. At this moment the turtle



Fig. 4. Photograph of Sucking-Fish, *Echeneis naucrates*, showing detail of sucking disc.

may have sensed our presence and began to make off leisurely. The fisherman seized the sucking-fish by their heads, loosening their grasp from the boat; tossed them in the direction of the sea turtle which was about two points on our starboard bow and they swam rapidly in its direction. The lines ran out of the bow quickly and, using our hands as a check, we soon felt the lines go taut and the vibrations that came back indicated that our living fish-hooks were fast to their quarry. The fisherman implored us to hold tight and by no means to let the lines slacken as the tighter we held them the better the hold of the remora. We rowed up to the turtle, pulling in on our lines and found it to be a hawk's-bill. The fisherman made a noose fast to its neck and front flippers and with some effort we got him amidships in the boat. Once out of the water, the remoras relaxed their hold on the plastron of the turtle, the native boatman all the while indulging in much gentle talk concerning his friendship for the *pega-pegas* and reassuring them that they would be well fed and cared for on their return home. The other members of the party in their boats had the same experience except that one of them bagged two turtles during the course of the morning.

#### OBSERVATIONS ON REMORA FISHING IN COLOMBIA

The first and only heretofore published account of remora fishing in the waters of northern South America is from the pen of Lady Anne Brassey. She observed the custom off La Guayra and included an account of it "In the Trades, the Tropics, and the Roaring Forties." This isolated observation, the authenticity of which has been doubted, is now confirmed and fills an interregnum of many years.

Dr. Solomon De Sola, while at Puerto Colombia (Savanilla) on the Colombian coast to the westward of Venezuela, in 1920, thirty-five years after Lady Brassey's account, made observations which he thus reports:

On the beach at Salgar, near Savanilla, my attention was called to some native fishermen and Tubura Indians who were fastening ropes of *majagua* bark about three feet in length and from one eighth to one quarter inch in diameter to the tails of sucking-fish. These remora are used to catch the edible and tortoise shell turtles found along the coast. The custom of using these fish for fishing is restricted to a few Indians and is not widely known. This is significant as there are many fishing villages along this region of the Colombian coast.

#### COMMENTS

While these descriptions are not radically different from those of many authors, it is interesting to quote Dr. Jordan who, in his monumental work on *Fishes* says:

The commonest species, *Echeneis naucrates*, called pega-pega or pegador in Cuba, reaches a length of about two feet and is almost cosmopolitan in its range, being found exclusively on the larger sharks notably on *Carcharias lamia*. [Italics mine.]

The specimens used near Matanzas measured 31 and 35 inches in length, and were of the same species mentioned by Jordan. The identification has been made with the use of the papers by Nichols and Breder and by Beebe and Tee Van.

At Cardenas, on the afternoon following our remora excursion, I saw turtles brought in from pound nets with remora attached to their plastra and upon inquiring whether they had anything to do with the fishing I

was informed that, on the contrary the turtles were frequently found with remora firmly attached to their undersides.

The fish's name: *remora* is a word well incorporated into the Spanish language and the dictionary of the Spanish Academy lists the word as of Greek origin and meaning: hindrance, obstacle, cause of delay. The ichthyological term for the typical genus of the sucking-fishes is directly derived from the Greek word *ἔχρησις*, from *ἔχω*, to hinder, and *ῥῆσις*. The Spanish lexicographer, Arturo Cuyas, gives a very similar definition of the name *remora*.

As regards the swimming powers of remora, Breder (1926) has an interesting note:

That fishes of such natatorial powers possess such a highly specialized organ as the cephalic disc is interesting, for they have apparently suffered no particular degeneration of their power to care for themselves in a locomotor sense, for of course they must first catch their shark. In this connection, their square tail is of special significance as short spurts of speed are naturally requisite.

Regarding the adhesion of the sucking-fish, Gudger cites Townsend's experiments and paper, quoting Mr. L. L. Mowbray as believing that the fish under strain while under the weight of a considerable column of water can not relax the grip of its disc.

Townsend in writing of his own experiment says:

By way of testing its fish-catching capacity, a shark-sucker sixteen inches long was liberated in one of the tanks of the Aquarium containing fishes. It took hold at once, and by hauling on the cord fastened to its tail a good-sized grouper was brought to the surface of the water, although it could not be lifted out of the tank. When the fish began to struggle the shark-sucker let go. When tried on a fifteen pound sea turtle, the latter could easily be drawn to the surface.

There can be no doubt that with a line attached to a large remora a much larger sea turtle could be hauled in without difficulty.

Mowbray's belief is sustained by the admonitions of the boatman mentioned above to hold the line taut so as to help the remora. I have picked specimens out of the water and examination of the lamellae convinces me that this is not a local superstition but a physical fact.

Gudger gives a method of calculating the "pull" that an *Echeneis* might withstand when employed as a fish-hook and deduces that a fish with its sucking-disc having an area of 13.5 square inches could easily sustain a pull up to ninety-nine pounds.

#### CONCLUSIONS

1. The custom of fishing with remora is a cosmopolitan one and further-researches and observations will probably reveal many new and unknown localities where the custom is in practice.
2. The Jardinellas de la Reina are located in the Bight of Manzanillo on the south coast of Cuba.
3. Remora fishing is still practised there upon the original site observed by Columbus more than four centuries ago.
4. With the exception of Matanzas, the remora fishing locations in Cuba are near or at places where descendants of the Carib people reside.
5. Thirty-five years elapsed between the observations made on the South American coast by Lady Brassey (1885) and by Dr. De Sola (1920). The custom is probably still in existence in Venezuelan waters.

6. *Echeneis naucrates* is not found exclusively on the larger sharks but is also seen on sea turtles.

7. Owing to the arrangement of the lamellae it is impossible for the remora to relax its hold when tension is placed on its horizontal axis.

8. From experimental evidence and observations there can be no doubt that the remora is capable of seizing on to sea turtles of considerable size and weight.

#### ACKNOWLEDGMENTS

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## Some Strange Teleost Skulls and Their Derivation from Normal Forms<sup>1</sup>

By WILLIAM K. GREGORY

THE student of the evolution of the fish skull at present has access to three sources of evidence which may throw light on the steps by which the most highly specialized skulls have been produced: (1) by comparing the less specialized with the more specialized in different groups he may work out a tentative hypothesis as to the sequence of stages; (2) he may then examine the palaeontological record of fish life, which extends from early Palaeozoic to modern times; (3) for the answer to certain morphological questions he may appeal to embryology.

In the future experimental biology may also contribute its quota to the evidence already amassed by comparative anatomy, taxonomy, palaeontology and embryology.

On the palaeontological side the student of evolution of the fish skull has access to a record that extends from early Palaeozoic times to the present day. Fortunately survivors of many of the earlier groups still persist along with their more highly evolved relatives. The comparison of these "living fossils" with their ancient and modern relatives has already often enabled the palaeichthyologist and taxonomist to work out the general sequence of types from the oldest ganoids of the Old Red Sandstone to the most specialized forms of living teleosts.

The typical fish skull is a structure of great complexity, which has doubtless been diversely modelled by many intrinsic and extrinsic factors. It comprises two general systems, the neurocranium and the branchio-

cranium. The neurocranium surrounds and protects the paired olfactory, optic and otic capsules; it also forms a bony chamber for the brain. The three paired capsules, in spite of infinite diversity in detail, are invariably arranged in this fore-and-aft sequence on either side of the brain trough.

The branchio-cranium, lying chiefly beneath the neurocranium, includes the branchial arches and the jaws, the latter being originally derived from bony plates cover the outer part of the branchio-cranium, while dentigerous patches arise on the jaws, palate and pharynx.

The intrinsic factors affecting the teleost skull may be defined as those which have been initiated in the various organs of the head itself. The extrinsic factors, although apparently originating outside the head, may profoundly modify its form.

With regard to intrinsic factors affecting the form of the neurocranium, the olfactory organ in teleosts perhaps never attains the importance that it does in the sharks. Even when the olfactory region of the skull is greatly elongated, as in the mormyrids, it is doubtful whether this implies improved olfactory sense; it may be merely in order to produce an elongate tubular bill. Even the basic ganoid *Cheirolepis* from the Old Red Sand-

<sup>1</sup> Read at the Washington meeting of the Society, May 6, 1912.