

# Two New Freshwater Fish Records for Trinidad and Some Comments on the Zoogeography of the Southern Peninsula

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TWO recent studies of the aquatic fauna of certain areas in the southwestern peninsula of Trinidad have yielded specimens of two species of freshwater characid fishes previously unrecorded for Trinidad. They are *Brycon siebenthalae* Eigenmann (1912) and *Triportheus elongatus* (Günther 1864), both belonging to the family Characidae, sub-family Bryconinae (Géry, 1977).

Two individuals of *B. siebenthalae* (Fig. 1) were caught by the senior author in the Quaragoon River west of the Chatham South Road and about three kilometres from the river mouth (Fig. 2(b)). They were caught with a three-millimetre-mesh push seine on 8/2/80 and 9/5/80 within the same section of the river which, at this point, is approximately three metres wide and 80 cm deep, shaded by cultivated cocoa, silk cotton (*Ceiba pentandra*) and fine leaf (*Pentaclethra macroloba*). This section of the river is a refuge of permanent water during the dry season in

an otherwise intermittent stream. Both individuals were of a large size, 174.4 and 200.9 mm standard length respectively. The first individual caught had an arc-shaped wound on its dorsal side which may have been caused by caiman which are common in the river at that point. The second specimen was subsequently identified by Dr. Stanley Weitzman of the U.S. National Museum, Washington DC, as *B. siebenthalae*; Dr. M. Boeseman of the Rijksmuseum van Natuurlijke Historie, Leiden, confirmed the identification of the first specimen as also being this species. Interestingly, *B. siebenthalae* was known only from the type specimen housed in the Chicago Museum of Natural History, originally caught in Mud Creek, Aruka River, Guyana. The two recently caught specimens are now housed in the USNM (cat. no. 235526) 200.9 mm SL, and the RMNH (cat. no. 28943), 174.4 mm SL.

Two individuals of another characid, *Triportheus elongatus* (Fig. 3), were caught with a horned cast net by the junior author in the mouth of a channel leading from the sea into Los Blanquiales Lagoon (Fig. 2(b)) on 21/9/81. A further eight specimens were collected by the junior author in a similar locality on 1/10/81. These specimens were tentatively identified by Dr. Max Sturm of the IMA as *T. elongatus*. Meanwhile, on 29/9/81, a collection made by the senior author and Prof. J.S. Kenny at the mouth and lower reaches of the Quaragoon River (about six kilometres from the Los Blanquiales site) yielded 12 more individuals. Five of these were positively identified by Dr. S. Weitzman as *Triportheus elongatus* and are now lodged at the USNM (cat. no. 229911), 56 – 108 mm SL. Dr. Weitzman also commented on the uncertain taxonomy and need for revision of this genus.

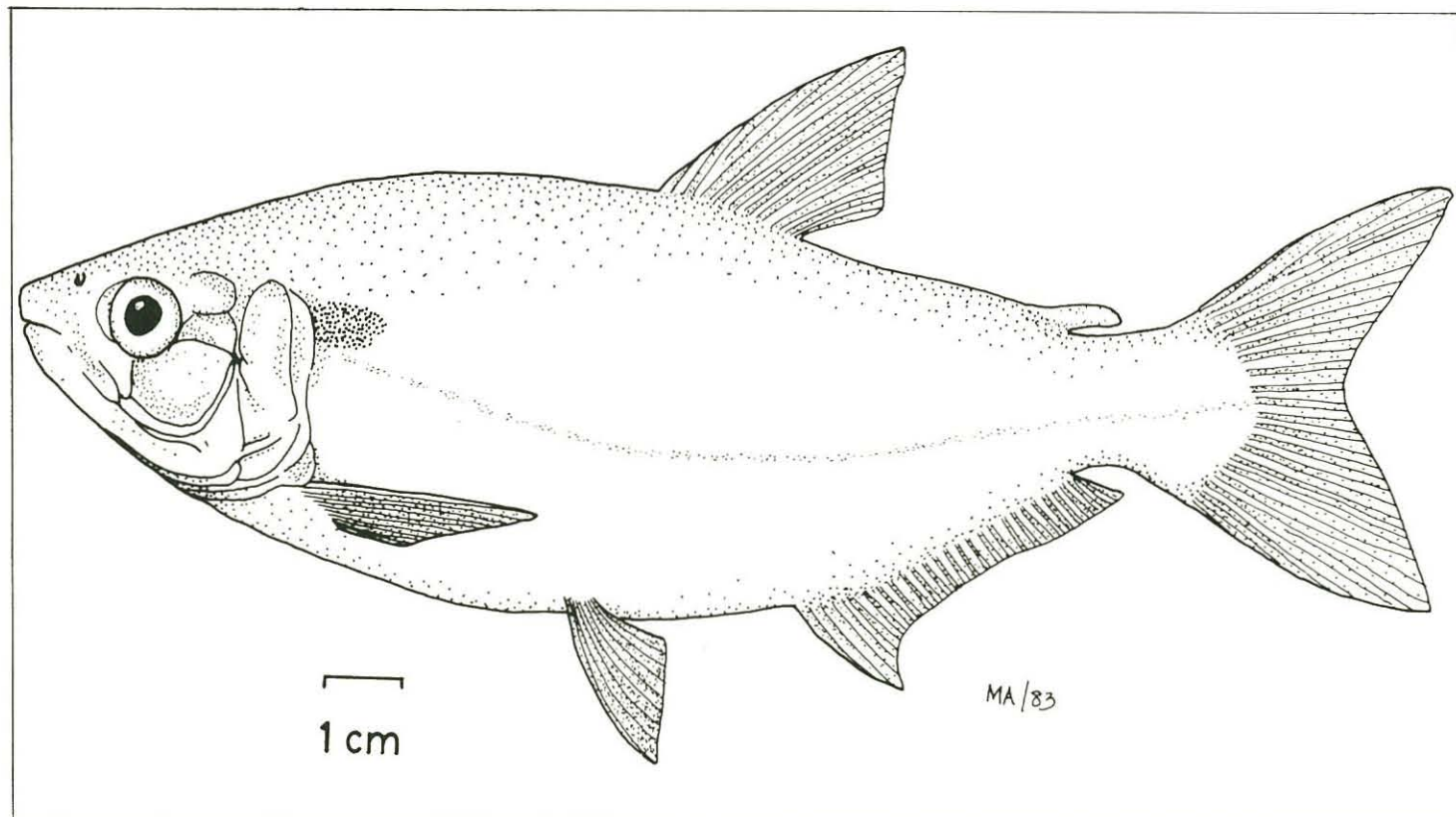
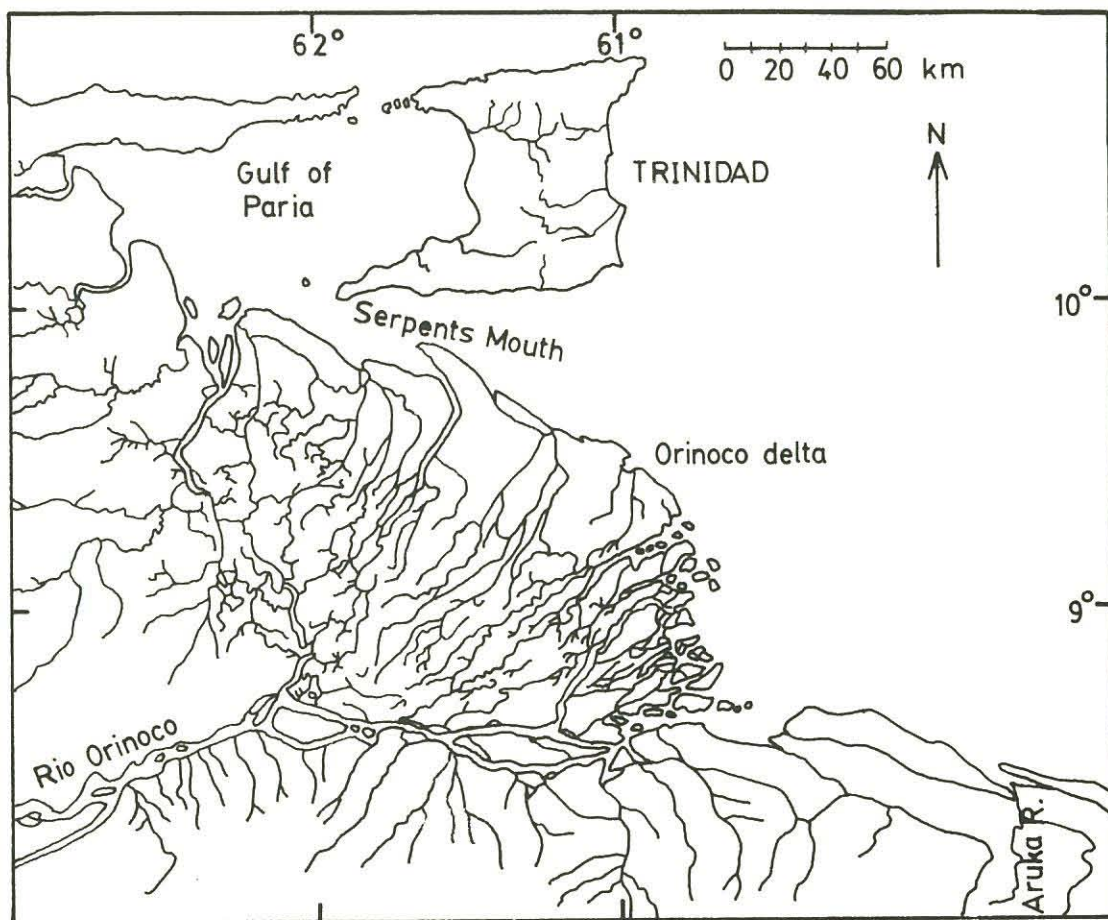
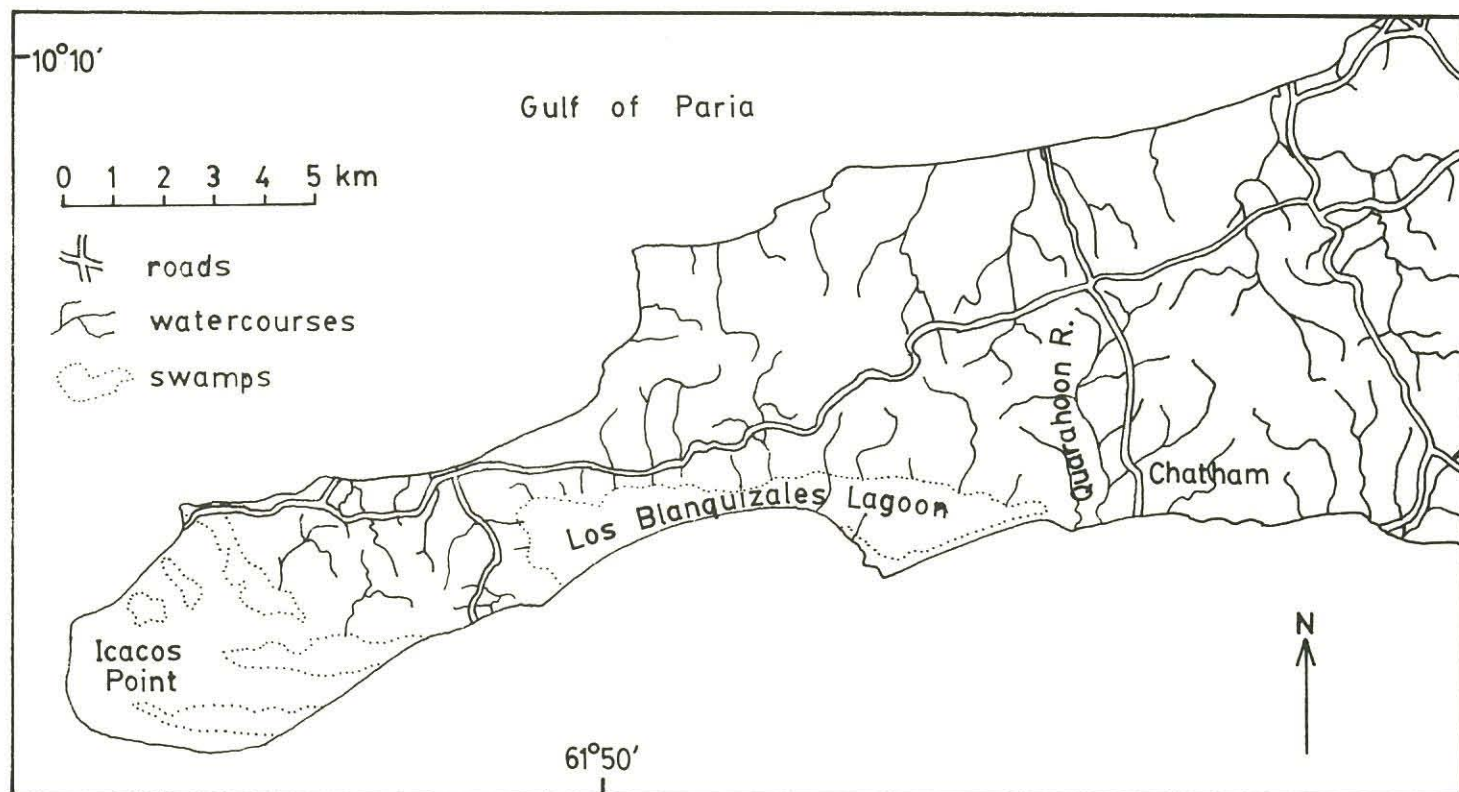


FIG. 1: *Brycon siebenthalae* (re-drawn from Eigenmann, 1912).



(a)



(b)

FIG. 2: (a) Trinidad in relation to the Orinoco delta and Aruka River, Guyana (adapted from van Andel and Postma, (1954).

(b) The southwestern peninsula of Trinidad showing collecting areas and general hydrography.



*Brycon siebenthalae* was previously considered 'peculiar to the Guianas' being known from only one specimen caught in the Aruka River drainage, western Guyana (Eigenmann, 1912)<sup>1</sup>. However, Mago-Leccia reports that although there are no publications on it other than the type description, he has found it common in the middle and lower parts of the Orinoco drainage (Mago-Leccia, pers. comm. to S. Weitzman). Further, there is a possibility of this species having an even wider range than previously recorded because the South American faunas are so poorly known. *Triportheus elongatus*, on the other hand, seems to have a fairly well documented wide range, being common in the Upper Amazon (Géry, 1977) and also occurring down to the mouth of the Amazon (Garman, 1890, cited in Eigenmann, 1912), the Orinoco near Ciudad Bolívar (Steindachner, 1879, cited in Eigenmann, 1912) and north-western Guyana (Eigenmann, 1912). However, given the need for revision of this genus, the seemingly wide distribution of this species can only be regarded as tentative.

Locally, neither of these two species has been recorded from previous collections (most recently Price, 1955; Boeseman, 1960, 1964, and Kenny, in prep.) which have all included coverage of the southwestern peninsula and, in particular, the same drainages where these two species were found. This strongly suggests that the presence of *B. siebenthalae* and *T. elongatus* is as a result of dispersal from the South American mainland and not as a result of inadequate sampling in previous collections. If this is the case, these new records raise certain questions about the degree to which the salt water crossing between Trinidad and the mainland acts as a barrier to freshwater fish movements.

Characins have generally been considered primary freshwater fishes, that is, they are strictly confined to freshwaters with little or no tolerance for salt or brackish water (Myers, 1938; Darlington, 1957; Roberts, 1973; Géry, 1977; and others). Although Myers (1938) points out that some characins do enter brackish water in estuaries, he stresses that these and other primary division freshwater fishes would not survive in the sea for more than a few hours and none would breed there. He further generalises that there is a tendency for all or nearly all the species of one family to show a similar tolerance for salt water. Darlington (1957) questions the validity of this assumption since the salt tolerances of many freshwater fishes are generally unknown and he cites several examples of fish belonging to primary division families which enter the sea, for example, a Japanese carp (cyprinid), *Acharya hakonensis*, widely distributed in rivers and frequently taken in the sea (Myers, 1938; Jordan, 1905 and Okada, 1955, cited in Darlington, 1957). The specimens of *T. elongatus* collected by the junior author were caught in water of salinity 12‰ (Sturm and de Souza, in press), while those caught by the senior author were found in greater numbers at the mouth of the Quarahoon River (salinity estimated by taste to be about 5 – 10‰) than further upstream in less saline conditions. These fish at the river mouth showed no obvious stress and there is a possibility that the difference in relative abundance observed when moving upstream might indicate a salinity preference as a result of acclimation. Further, three of the specimens caught at the mouth of the Quarahoon River on 29/9/81 are still alive at the time of writing (January, 1983) in the Zoology Department, having been kept in unfiltered, unaerated water of salinity 5‰ and have grown substantially during this time. This indicates a certain degree of hardiness and salinity tolerance for extended periods for these individuals.

The south coast of Trinidad is separated from the mainland by a shallow channel about 10 kilometres wide, and from the delta of the Orinoco by a distance of 20 to 25 kilometres (Fig. 2(a)). Surface salinities range here from 30‰ at the mouth of the Orinoco to 34‰ at the south coast of Trinidad in the dry season, and 5‰ to 15‰ respectively in the wet season (van Andel and Postma, 1954; Fukuoka, 1964). This decrease in wet season salinities is caused largely by the increased discharges from the South American rivers, for example, the Orinoco, Essequibo and others. These salinity readings were taken only during the 'early rainy season' (van Andel and Postma, 1954), and during

the months of August 1960 and April 1961 (Fukuoka, 1964) and therefore are not seasonal averages, nor are they indicative of extreme conditions which might ensue at certain times of the year. It can therefore be expected that during times of intense flood of the larger mainland rivers, surface salinities may be even lower than those recorded, or be consistently low from the mainland to the Trinidad south coast.

Under these conditions, it is conceivable that characins such as *Triportheus elongatus* which seem to have some degree of salt tolerance may be able to accomplish such a crossing. This event is not totally unlikely since a similar situation exists on the west coast of British Columbia. The freshwater peamouth chub, *Mylocheilus caurinus*, has been shown to be able to successfully accomplish an experimentally simulated crossing of the 48 kilometre Strait of Georgia separating the Fraser River on the mainland and the Nanaimo River on offshore Vancouver Island where it occurs (Clark and McInerney, 1974). This salt intolerant fish seems to be assisted by low salinities across the Strait, ranging from 2‰ at the mouth of the Fraser River to 15‰ near Vancouver Island, which are caused by rapid snow melt and consequent large discharge of the Fraser River on rare occasions. Such 'low salinity corridors' may well exist between the South American mainland and Trinidad during the wet season.

Another way in which freshwater animals may cross salt water barriers is by being carried along with the flood of large rivers within rafts of vegetation. Gorman (1979) reports that during a hurricane in the Pacific in 1971, rafts of vegetation up to 10 metres across were swept out of the Rewa River, Fiji, into the Pacific Ocean and on these were collected three species of freshwater molluscs and six species of arthropods. A similar situation very likely exists locally since the south coast beaches are often littered during the rainy season with tangled mats of *Eichornia* sp. which during life, serve as a habitat for many terrestrial arthropods and small aquatic organisms (Dasmann *et al.*, 1973; National Academy of Sciences, 1976; Mitchell, 1978). Similar mats of *Eichornia* have been observed by the senior author at the mouth of large rivers in Surinam even in May, and also living mats have been seen at the mouth of the Quarahoon River in the rainy season.

The possibility of dispersal from the mainland to the south coast of Trinidad also exists for other mainland species. Kenny (1977) records the frog *Leptodactylus macrosternum* from a swamp on the southwestern peninsula and suggests that it is a new arrival from the mainland. Tapir, *Tapirus terrestris*, and capybara, *Hydrochoerus hydrochaeris*, have in the past, appeared in the forests of the southern part of the island but no breeding populations of either exist in Trinidad. Also, in mid-1981, a specimen of the mata mata, *Chelys fimbriata*, was caught by villagers on the beach near the Chatham area on the south coast. This species is said to be a rare inhabitant of Trinidad (Underwood, 1962) but the presence of barnacle shells on the carapace of this specimen is evidence for prolonged exposure to estuarine or marine conditions and there is a possibility of it having crossed from the mainland to the south coast of Trinidad. This specimen is currently on display at the Emperor Valley Zoo, Port of Spain.

1. There is some discrepancy in Eigenmann (1912) with respect to *Brycon siebenthalae*. Firstly, the specific name is spelt in two different ways, being *B. siebenthali* in the species lists of the locality tables, and *B. siebenthalae* in the type description and elsewhere. Secondly, in a table comparing the species composition of different regions from the Orinoco to French Guiana, *B. siebenthalae* is recorded as being from 'the Essequibo below Warraputa' while in a second table showing the distribution of species obtained in the areas examined during Eigenmann's expedition, the one individual caught is recorded as being from 'coastal streams, northwest coast'. The latter locality is supported by the locality data in the type description, Mud Creek, Aruka River, which is shown in the plates to be quite distinct from the Essequibo River. It seems, from the report of the expedition, that Eigenmann himself did not collect this specimen since a colleague, Mr. S.E. Shideler who accompanied him on this expedition to Guyana, made collections in the northwest coastal region while Eigenmann worked slowly along the Potaro and back down the Essequibo River. This may be a reason for the discrepancy in allocation of a locality.



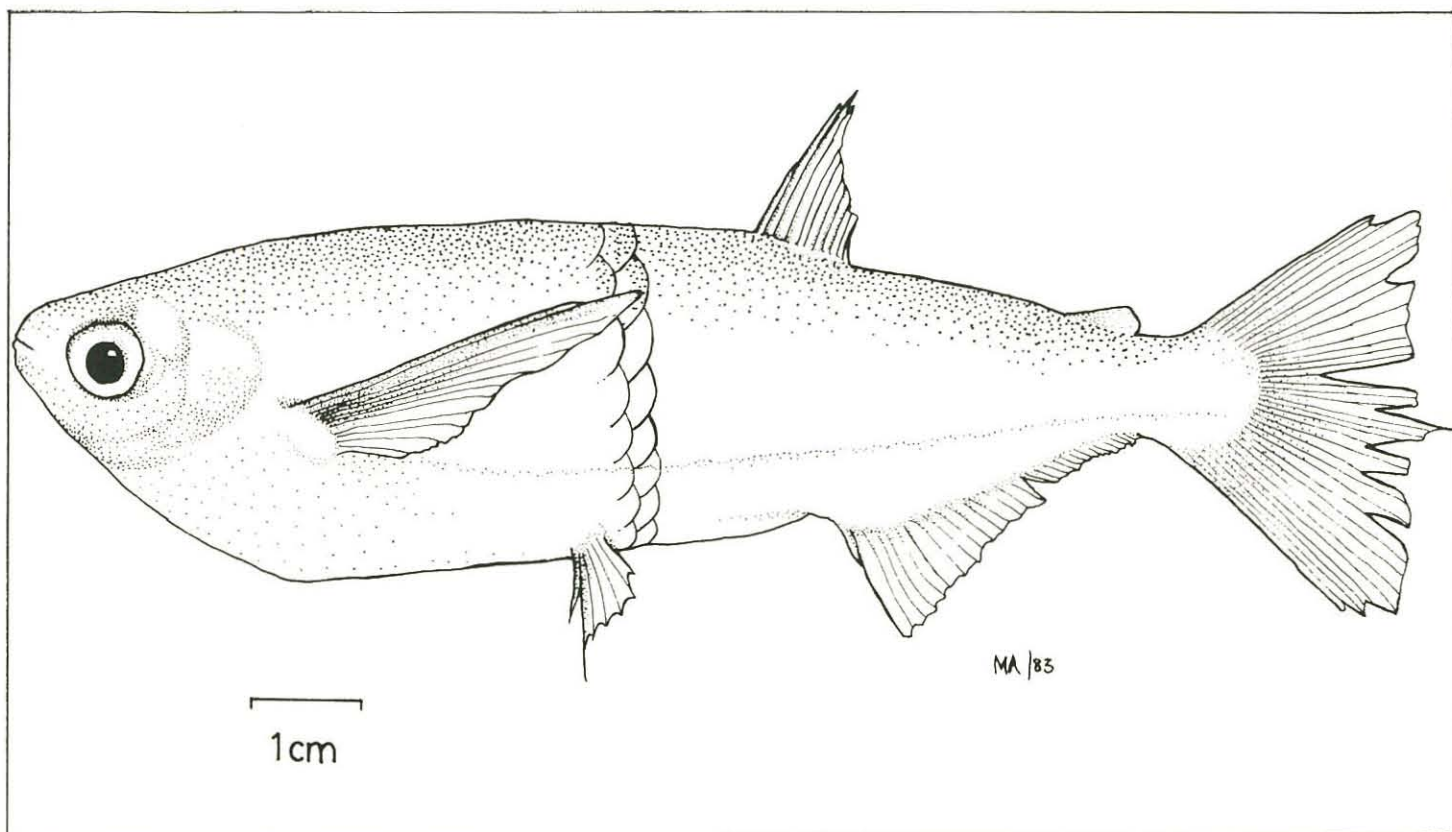


FIG. 3: *Triportheus elongatus* (drawn from photographs taken by J.S. Kenny).

Dispersal, however, does not necessarily imply successful colonisation, since this depends on the establishment of breeding populations. In the case of *B. siebenthalae*, establishment does not seem to have occurred in the Quarahoon River since intensive fishing of the same stream has been carried out every month up to July 1982, and no further adults or juveniles have been obtained. It has not been ascertained whether *T. elongatus* is still present and, if so, breeding in the area.

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## Reptiles of Soldado Rock, Trinidad

By Hans E.A. Boos, Emperor Valley Zoo, Port of Spain

SOLDADO ROCK lies approximately 5 km due west of the south-western peninsula of Trinidad. Visits to this rock over the years by the Trinidad and Tobago Field Naturalists' Club have been made, and the flora and fauna noted.

The first mention of a reptile on Soldado rock was by Richard French when he lectured to the Club on September, 19 1969. This reptile was the Common Iguana, *Iguana iguana*. Though the iguana is recognised as a vegetarian, French (1969) noted that it eats the eggs of the Sooty Tern, *Sterna fuscata fuscata*, and the Noddy Tern, *Anous stolidus*, which nest on Soldado Rock from March to June. He also noted the four species of plant found there.\* These are the only land based plant food available to the resident iguanas. French queried the food and survival of the iguanas during the months when there were no eggs available. However beside the four plants some of which may be unpalatable to iguanas, from July to December great rafts of floating vegetation are swept out of the Orinoco River Delta and many of these rafts must make land-fall on Soldado Rock, which stands in the middle of the Serpents Mount passage, through which strong currents sweep (Field 1975) and the prevailing winds for these months funnel. Though these rafts consist mainly of the Water Hyacinth *Eichhornia crassipes* and Water Lettuce *Pistia stratiotes*, they most likely provide sufficient other vegetation as well, on which the Iguanas can feed. Iguanas are more than likely carried to Soldado Rock on these floating food-stores.

The expedition to Soldado Rock by the Trinidad and Tobago Field Naturalists' Club on March, 28 1982, revealed that not only were the iguanas still present and surviving, for one specimen was caught, examined, photographed and released, but that another reptile had managed to reach this barren rock, most likely as a passenger too, on the rafts of north-westerly drifting plants and debris.

A small gecko, a female of the species *Sphaerodactylus molei* was collected (V. Quesnel 1982) under loose rocks on the eastern slope of the rock. Searches failed to turn up any more. This specimen was photographed and preserved.

Thus the list of reptiles of Soldado Rock is as follows:

Family: Iguanidae

*Iguana iguana iguana* (Linnaeus)

Iguana

Family: Gekkonidae

*Sphaerodactylus molei* Boettger

Mole's Gecko

Isolation on such a small rock with a restricted, chancy and seasonal food supply must put great pressure on the population of iguanas there and must prompt them to utilize their swimming prowess to secure food at times from the sea. Rafts of vegetation sweeping past or washed up near the island on the many exposed reefs must tempt the iguanas to secure this food by swimming to get it.

Evidence of this was the young iguana found in the stomach of a grouper caught by my father fishing on the reefs off Soldado Rock in the 1950s.

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\* On the club's visit on 28 March 1982 five species of plant were found: *Eleusine indica*, *Plumbago seandens*, *Paspalum vaginatum*, *Mariscus ligularis* and *Portulacca oleracea*. Ed.