

## Juvenile reef fish can survive without mangroves on Mayotte

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Image: Rakamaly Madi Moussa

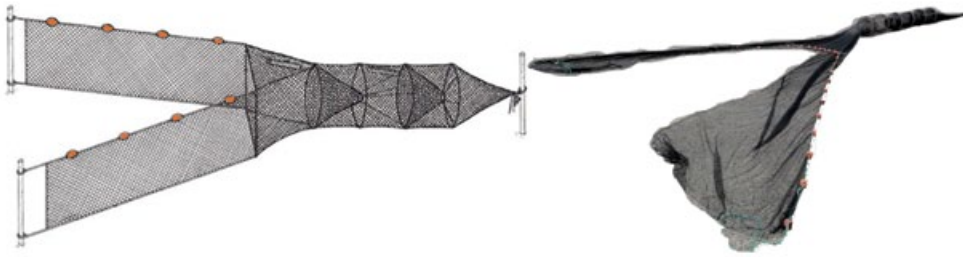
*Although studies in the Caribbean indicate that mangroves play a major role as nurseries for juvenile coral reef fish, most research in the Indo-Pacific show the opposite. The juveniles of only a few species in the Carangidae, Sphyraenidae, Mullidae and Lutjanidae families swim in mangrove swamps on Mayotte. If mangroves disappear, however, coastal erosion will increase, lagoon water will grow murky and neighbouring coral reefs will disappear.*

In the Caribbean, mangrove swamps contain high densities of several coral reef fish species that migrate to the reef once they reach the sub-adult stage. Such areas are considered important nursery habitats for juvenile fish. Several hypotheses have been advanced to explain the abundance of juveniles in mangroves, including that juveniles are attracted by the swamps' varied structure, low predation risk or higher food availability, etc.

On Mayotte Island, mangroves account for 29% of the coastline and extend across 740 ha, mainly in bay heads. The biotope has unfortunately been damaged by human activity such as bush clearance, grazing, landfill and other coastal development. It is, therefore, essential to understand the role played by mangroves for reef fish on the island today so as to assess the dangers if their habitat is lost due to man-made disturbances or climate events.

Sampling was carried out during the wet season in February and March 2013 in four areas on the mangrove front, including two in a river estuary. A fyke net was used as fishing gear, as it is passive and highly effective in lagoon environments. When visibility was adequate, a visual count near the net was combined with sampling. The net was cast and hauled as the tide ebbed or flowed, i.e. four times per area. The island had a broad tidal range of four metres with the fishing area lying completely exposed at low tide.

The fishing gear performed satisfactorily with more than 4129 specimens sampled along the mangrove front for a biomass of 41,460 g representing 43 species and 28 families. Species richness varied from one area to another, although the difference was not significant. Distance from the coral reef had little effect on species richness



Fishing gear (fyke net) used for sampling on the mangrove front.

variations, although a river appeared to affect the number of species seen ( $r^2 = 0.92$ ). Generally speaking, the coastal *Atherinomorus lacunosus* species dominated the fish population at 74% of total numbers, followed by the Leiognathidae (*Leiognathus dussumieri* 4.3%, *Leiognathus equulus* 4.1%), Apogonidae (*Apogon amboinensis* 3.6%), Carangidae (*Caranx heberi* 2.7%) and Sillaginidae (*Sillago sihama* 2.6%) families. Biomass varied according to tide, with the rising tide containing more. The broad tidal range in the mangroves, along with fairly deep water at high tide, increased carnivore predation on smaller fish. Species such as *Lethrinus harak*, *Sphyraena barracuda*, *Lutjanus monostigma*, *Platax orbicularis* and *Lutjanus argentimaculatus* moved trophically as the tide rose.

They could be considered ubiquitous, as they swam in both mangroves and coral reefs. However, the mangrove's importance to Mayotte's reef fish is limited, and its role as a nursery for juveniles was not borne out by this study.

As there is no major interaction, the loss of this habitat would most probably have no direct effect on the coral reef's fish population. However, on Mayotte, losing the mangrove could conceivably result in serious coastal erosion, and increases to water turbidity, earth deposits in the lagoon and, in the long run, changes to the coral reef population. Because of this, and as the mangrove is at risk, preserving the habitat could usefully be incorporated into coastal management programmes.



Examples of the various species caught on Mayotte's mangrove fronts (images: Rakamaly Madi Moussa).