

## New species of deepwater snapper identified from shape of ear bones

*The ruby snapper has been a prize catch for deepwater snapper fishers throughout the Pacific for many decades. But recently, we discovered that there are actually two species of ruby snapper: the ruby snapper (*Etelis carbunculus*), and the pygmy ruby snapper (*Etelis marshi*). The Ecosystem Monitoring Section of SPC's Oceanic Fisheries Programme has been working with scientists from the Western Australia Fisheries Department to develop a reliable technique to distinguish between the two species, based on the shape of their otoliths (ear bones). The results from this research have been published online in the latest issue of Fisheries Research.<sup>1</sup>*

Variation in the maximum size of ruby snapper in different parts of the Pacific provided a clue that there may in fact be more than one species. So we collected fin clips from a large number of ruby snapper throughout the Pacific region for genetic analysis. Geneticists from the University of Hawaii conducted the analyses, which confirmed the presence of two distinct species.

The distribution of the two species in the Pacific is similar, but it appears that only the pygmy ruby snapper is found in Hawaii, as there have been no confirmed reports of ruby snapper. In many other parts of the Pacific, both species can be caught at the same location. Therefore, it is important for fishers to distinguish between the two species in their catch.

The pygmy ruby snapper was not identified previously because its appearance is nearly identical to the

ruby snapper. So the question is, how do we distinguish between the two species without using expensive genetic analyses?

We know that the two species can sometimes be distinguished based on their size. For example, ruby snapper can reach at least 120 cm and 25 kg, whereas the largest pygmy ruby snapper is 62 cm and less than 5 kg. So we can be reasonably confident that fish larger than 70 cm are ruby snapper. But this does not help us to distinguish between species when the fish are smaller.

Preliminary research suggests that the two species can also be distinguished based on two external features: (a) ruby snapper have a black marking on the upper lobe of the caudal fin, which is absent in pygmy ruby snapper, and (b) pygmy ruby snapper have a much sharper spine on the operculum than ruby snapper (see Fig. 1).<sup>1</sup>



Figure 1. The ruby snapper (top) shows a black marking on the top of the caudal fin (a), which is absent in the pygmy ruby snapper (bottom); the pygmy ruby snapper has a much sharper spine on the operculum (b) than the ruby snapper.

<sup>1</sup> <http://www.sciencedirect.com/science/article/pii/S0165783613002385>

<sup>2</sup> See related article in issue #138 of SPC Fisheries Newsletter :

[[http://www.spc.int/DigitalLibrary/Doc/FAME/InfoBull/FishNews/138/FishNews138\\_04\\_Williams.pdf](http://www.spc.int/DigitalLibrary/Doc/FAME/InfoBull/FishNews/138/FishNews138_04_Williams.pdf)]



Figure 2. Top and side views of the earbones of a ruby snapper, *Etelis carbunculus* (left) and a pygmy ruby snapper, *E. marshi* (right) (images: Mélanie Bunel, © SPC).

However, both of these features can be subjective, and cannot be used if the tail and operculum spine have been damaged, which may happen during capture, transportation or freezing. Clearly, there is a need for a more objective method to distinguish between the two species.

We examined the otoliths from ruby and pygmy ruby snapper to see if there were any consistent features that were characteristic of each species. We examined the shape and measured the length, width, thickness and weight of otoliths from both species. We found that otoliths from pygmy ruby snapper were significantly wider, thicker and heavier at a given fish length than otoliths from ruby snapper. We demonstrated that these measurements could be used in combination to predict the species identity with 100% certainty when the species was unknown.

This finding provides a reliable method for identifying ruby and pygmy ruby snapper through the collection of otoliths when it is not possible to distinguish these two important deepwater snapper species by external features.

#### For more information:

Ashley Williams  
Deepwater Snapper Scientist, SPC  
ashleyw@spc.int



This issue of SPC's Fisheries Newsletter was produced with the financial support of the European Union.

The contents of this publication are the sole responsibility of SPC and can in no way be taken to reflect the views of the European Union.