Studies on Species Identification, Level of Vitamin A and Ciguatoxin Toxicity of Red Grouper

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Outline

一、Introduction

二、Genetic identification of red grouper and other grouper species

三、Analysis of the content of vitamin A in the liver of red grouper and the toxicity of ciguatoxin

四、Conclusion

Abstract

Serranidae is a common species of fish with high economic value in Taiwan. Most of them inhabit in tropical and subtropical oceans, and a few of them inhabit in freshwater. The huge size and ferocious habits make the grouper be the top predator in the food chain. Due to the effect of bioaccumulation and amplification, the liver of the grouper easily accumulates ciguatoxins and high amounts of vitamin A. If people consume them, it may cause risks of vitamin A poisoning and ciguateric fish poisoning. In the 1980s, there were severe cases of ciguateric fish poisoning caused by eating red grouper's liver in Taiwan. Therefore, in this study, the gene sequences and toxins of the common red grouper and several other groupers in Taiwan were analyzed by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP). With three different specific cleavage restriction enzymes *Msp* I, *Hinf* I and *Hae* III, seven species of grouper commonly found in Taiwan were successfully identified, and a map for rapid identification of fish species was established to achieve the target. On the other hand, the concentration and total content of vitamin A in the liver of fish were analyzed by high performance liquid chromatography (HPLC). The results showed that there was no correlation between the liver weight and the content of vitamin A in eleven specimen of *Plectropomus leopardus*, but there may still be high levels of Vitamin A in the larger fish 25,000-50,000 IU/d. Finally, the mouse bioassay (MBA) was used to determine whether the *Plectropomus leopardus* had the risk of ciguatera fish poisoning. The results present that some mice showed clinical symptoms such as diarrhea and dyspnea, but there was no death. The ciguatoxin content of fish is less than the minimum estimable ciguatoxin content of 0.025 MU/g. Therefore, it is no risk of ciguatera fish poisoning from eating these tested *Plectropomus leopardus*.

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