

## Effects of Dietary Supplementation of Cottonseed and Soybean meal on Reproductive Histology of Olive Flounder, *Paralichthys olivaceus*

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### Introduction

Studies on the use of cottonseed meal for FM replacement in marine fish species are very rare (Pham et al., 2005), and no study was reported on the reproduction or histology of olive flounder. Therefore, the aim of this study was to investigate the effects of dietary supplementation of soybean and cottonseed meal on reproductive histology of growing olive flounder.

### Materials and methods

The experimental diets used in the first feeding trial were formulated to be isonitrogenous and isocaloric to replace 0, 10, 20, 30, and 40% of fish meal protein by equal proportion (1:1, w:w) of cottonseed and soybean meal (CS) (designated by Control, CS10, CS20, CS30, and CS40, respectively). The CS diets were supplemented by DL-methionine and L-lysine to meet their dietary requirements (NRC 1993). The experimental diets used in the second feeding trial were formulated to be isonitrogenous and isocaloric to replace 0, 20, 30, and 40% of fish meal protein by equal proportion (1:1, w:w) of cottonseed and soybean meal (CS) with supplementation of iron and phosphorus (designated by Control, CS20, CS30, CS30+Fe&P, and CS40+Fe&P, respectively). The experimental diets were manufactured and fed to the experimental fish (initial wt.  $0.74 \pm 0.11\text{g}$  and  $28.7 \pm 0.17\text{g}$  for the first and second experiment, respectively) by a general feeding method (Pham et al., 2005). The experimental diets were fed to triplicate fish groups twice per day (9:00 and 16:00) ad libitum for 19 weeks and 26 weeks in the first and second feeding trial, respectively. The feeding trials were conducted in Marine and Environmental Research Institute, Cheju National University.

## Result and abstract

The gossypol existed in cottonseed meal is a well known antispermatogenic agent which can impair reproductive performances of male fish as well as mammals. Two feeding experiments were conducted with juvenile olive flounder for 19 weeks (unpublished) and withgrowing olive flounder for 26 weeks (unpublished), for the first and second feeding trials, respectively. After each feeding study, females and males were sampled for histological examination in gonads and liver to verify any negative effects by the dietary supplementation of cottonseed and soybean meal on reproduction. After two feeding trial,the gonad somatic index (GSI) values of male and female fed experimental diets (from the first feeding trial) were not significantly different among all the dietary treatments. The GSI values of female fed all the experimental diets (from the second feeding trial) were not significantly different among all the dietary treatments. However, males fed cottonseed and soybean meal containing diets exhibited significantly lower GSI than that fed the control diet after the second feeding trial. Histological examination of gonads and liver of fish fed cottonseed and soybean meal did not show any negative effects compared to those of fish fed the control diet. Hepatosomatic index values of fish fed all the experimental diets both in the first and second feeding trials were not significantly different among all the dietary treatments. The findings in this study suggest that dietary supplementation of cottonseed and soybean meal up to 40% fish meal replacement might not deteriorate the gametogenesis of juvenile and growing olive flounder. However, the supplementation in diets over 30% fish meal replacement might reduce GSI of male in growing olive flounder.

## References

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