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PHENOTYPIC DELINEATION OF WILD AND FARMED GILTHEAD SEABREAM *Sparus aurata* (L. 1758) ALONG THE EASTERN ADRIATIC COAST

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Introduction

The rapid identification of escaped farmed fish presents a challenge in the management of escapee scenarios due to phenotypic plasticity which enables them to respond adaptively to environmental change by modifying their behaviour and physiology. Rogdakis et al. (2002) demonstrated that hatchery - released gilthead seabream can gain wild morphotype after 6 to 7 months in wild habitats as a result of exposure to natural abiotic and biotic factors. Thus, the aim of the present study is to assess characteristics for morphological differentiation from wild and farmed gilthead seabream populations. Gathered morphometric data can then be used to form a database for enhancing the detection sensitivity of morphological tools in future farmed - escapee identification in wild populations.

Materials and methods

A total of 500 of farmed (mean 27.7 TL ± 2cm; 350.12 Wt ± 83.88g) and 500 of wild gilthead seabream (mean 25.8 TL ± 2.2cm; 262.5 Wt ± 40.6g) were sampled in the eastern Adriatic Sea. Eighteen anatomical landmarks were selected to obtain the overall body shape using TpsDig 2 software (Rohlf, 2001). Gilthead seabream body shapes were quantified and visualized by geometric morphometrics methods (Bookstein, 1997) in the MorphoJ software package (Klingenberg, 2008). Condition, gonadosomatic index and length - weight relationship were also recorded for each observed origin of fish.

Results

The body shape differences were most evident in head and trunk region. Farmed specimens displayed smaller head profile with stocky body form in comparison to wild individuals who had elongated body shape with larger head profile. Results from condition, weight gain rate, gonadsomatic index and from other biometric research in progress will be presented.

Discussion and conclusions

Geometric morphometrics differentiated wild and farmed gilthead seabream based on head and trunk body features. Comparative morphology studies of gilthead seabream across Mediterranean revealed similar findings (Šegvić Bubić et al., 2014; Arechavala - Lopez et al., 2012; Loy et al. 1999) where stocky body shape of farmed gilthead seabream is assumed to be the result of rearing environment and selective breeding programs. Different broodstock origins demonstrated various head shapes in comparison to wild gilthead seabream which can be related to divergent parental phenotypes since their use as selection criteria is still limited (Brown, 2003). Furthermore, modern aquaculture industry is more often driven by the consumer preferences for fillet products which has led the producers to target body shapes with higher body height and smaller head profile in order to gain better fillet yields.

Further research on ontogenetic allometry could increase the knowledge on how the body form in gilthead seabream is affected by the wild and farmed environmental factors since body proportions change as fish grows and adapts to transition in habitats with alternated abiotic and biotic factors.

Acknowledgments

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