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Effect of hCG and Ovaprim™ on reproductive characteristics of male Levantine scraper (*Capoeta damascina)*

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Abstract

Species richness and abundance within the genus *Capoeta* has been severely depleted. As such, there is great need for developing assisted reproductive technologies for controlling reproduction in captivity. Here, we conducted in vivo studies with single administrations of human chorionic gonadotropin (hCG) and Ovaprim™ [(D-Arg^6, Pro^{9}NEt)-sGnRH + domperidone] in wild-caught Levantine scraper, *Capoeta damascina* and then evaluated milt characteristics, fertilization success, serum sex steroids, and spermatogenesis via histological testicular development. Spermiation responses were significantly stronger for Ovaprim injected fish than those injected with hCG or saline. hCG had a negative effect on milt quality by reducing the percentage of motile sperm and fertilization success at 12 to 48 hours post injection (hpi), which was not observed after treatment with Ovaprim or the saline injection. Hormonal therapy resulted in higher sperm densities and spermatocrit, although sperm longevity was not impacted. Sex steroids were not impacted by hCG or saline injection, but Ovaprim effectively induced androgen and progestin release, as evident by higher serum levels of testosterone, and 17α,20β-dihydroxy-4-pregnen-3-one. Consequently, their levels peaked at 12 hpi, which coincided with maximal milt production. Histological analysis of the testes and quantification of germ cell types revealed that Ovaprim significantly stimulated spermiogenesis, as a higher number of accumulated spermatozoa were observed at 12 h and 24 hpi. Testes from saline and hCG-injected fish remained unchanged through the experiment, and contained all stages of germ cells, predominantly spermatocytes with few spermatozoa. In conclusion, Ovaprim treatment successfully induced steroidogenesis and maturation of spermatogenic germ cells, leading to spermiation and milt production without having any negative impacts on sperm quality and fertility in wild-caught *C. damascina*.

Keywords: Hormonal treatment, Milt quality, Testes histology, Sex steroids

1. Introduction

Levantine scraper, *Capoeta damascina* belongs to the genus *Capoeta,* which covers a wide geographic range from Eastern Europe to West Asia [1]. In their native environment, males mature after 1 year, while females mature at 2 years and depending on geographical origin, the spawning season occurs from early May to late July at