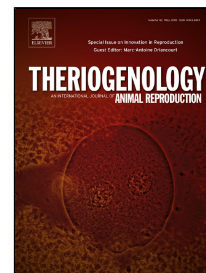


# Accepted Manuscript

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

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

3  
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13  
14 **Abstract**

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

38  
39 **Keywords:** Hormonal treatment, Milt quality, Testes histology, Sex steroids

40  
41 **1. Introduction**

42  
43 Levantine scraper, *Capoeta damascina* belongs to the genus *Capoeta*, which covers a  
44 wide geographic range from Eastern Europe to West Asia [1]. In their native  
45 environment, males mature after 1 year, while females mature at 2 years and depending  
46 on geographical origin, the spawning season occurs from early May to late July at

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