

PLASMA SEXUAL STEROIDS AND FATTY ACID ANALYSIS OF ADULT ADRIATIC STURGEON DURING REPRODUCTIVE SEASON

M. Vasconi¹, M. Mandelli², N Govoni², A. Parmeggiani², O. Mordenti² and V. M. Moretti¹

¹ Department of Health, Animal production and food safety. Università degli studi di Milano. Via Trentacoste 2 20134 Milan - Italy

² Department of Veterinary Medical Sciences. Alma mater studiorum, Università di Bologna

INTRODUCTION

The reproductive physiology of sturgeons is a topic of constant relevance, due to some peculiarities that characterize the reproductive cycle of these fish and the need to better understand reproduction to improve methods used in aquaculture programs. Female sturgeons need more than a year to complete their roe maturation and their reproduction occurs every 2-5 years according to species and other variables, while captive males could reproduce every year. The aim of the present study was to investigate the concentrations of estradiol 17 β (E2), testosterone (T) and fatty acids extracted from Adriatic sturgeon plasma collected during the spawning season, in order to evaluate if plasma analysis could provide useful information to sturgeon farmers in broodstock selection.

MATERIAL AND METHODS

56 adult captive Adriatic sturgeon (*Acipenser naccarii*) from the breeding stock of Parco del Ticino were included in the trial. Blood samples were collected in mid-June from the caudal vasculature and a gonadal biopsy was collected to determine the sex and female stage of maturity (Figure 1).

Plasma was obtained after centrifugation at 3000g for 15 min of heparinized blood. Sex steroids were measured by RIA analysis, and fatty acids were measured by gas chromatography after direct plasma methylation.

RESULTS

According to biopsy Adriatic sturgeon were divided into 3 groups:

- Male (32) Size W. 29.9 \pm 12.2 kg; L. 165.3 \pm 25.3 cm
- Female that will not spawn during the season (11) Size W. 23.9 \pm 6.2 kg; L. 151.3 \pm 12.3 cm
- Female that will spawn during the season (13) W 24.1 \pm 5.5 kg; L 146.1 \pm 13.2 cm

The E2 concentration ranged from 0.01 to 19.24 ng/ml, while testosterone ranged from 3.84 to 132.60 ng/ml. Testosterone and E2 concentrations were not different between males and non reproductive females, while their concentration was elevated (109.1 \pm 15.3 and 9.7 \pm 5.3 ng/ml respectively) only in females that would spawn during the year of sampling. Female sturgeon with immature oocytes had E2 concentrations that were not statistically different from males (0.42 \pm 0.54 versus 0.07 \pm 0.08 ng/ml) (Figure 2).

Plasma fatty acid data were not different between sexes. The most representative fatty acid found was oleic acid (18:1 n-9) followed by palmitic acid (16:0) and DHA (22:6 n-3). Finally, the total amount of plasma fatty acid did not differ between sexes or among females with different stages of gonadal maturation.

CONCLUSIONS

Our study suggest that E2 plasma concentration could be used as marker to identify which females of Adriatic sturgeon are ready to be used as reproducers, while testosterone and plasma fatty acid have not shown the ability of identify Adriatic sturgeon that were nearby their reproduction .

Figure 1 . Gonad biopsy of female Adriatic sturgeon. 1 and 2 non spawning female with over riped and immature oocyte ; 3 spawning female

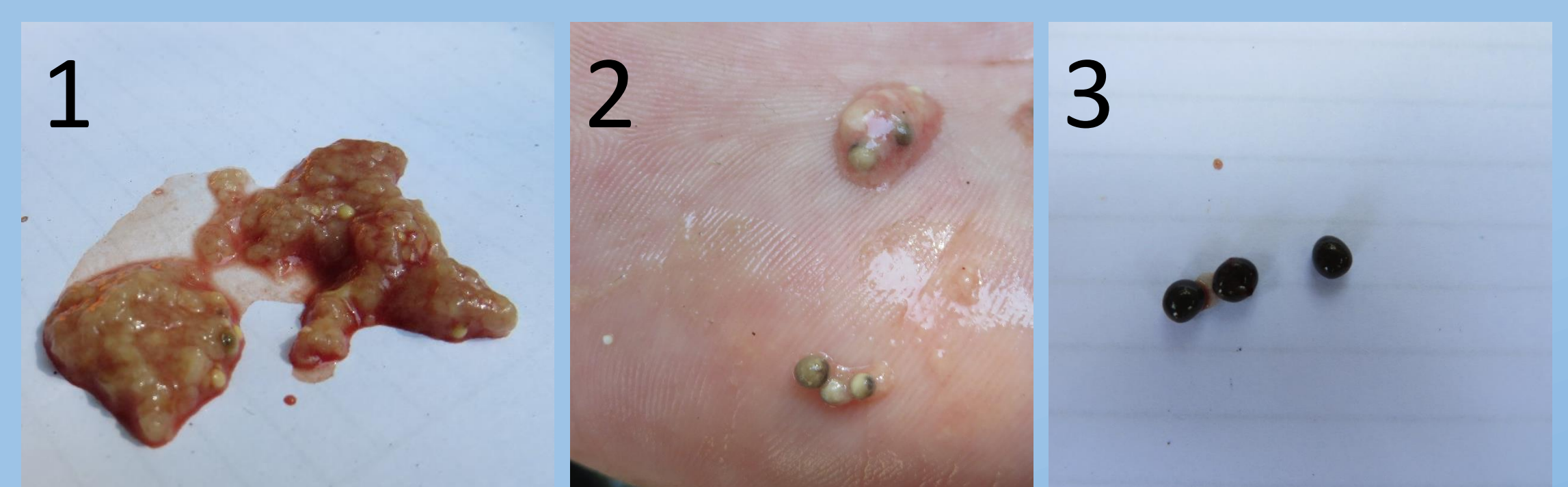
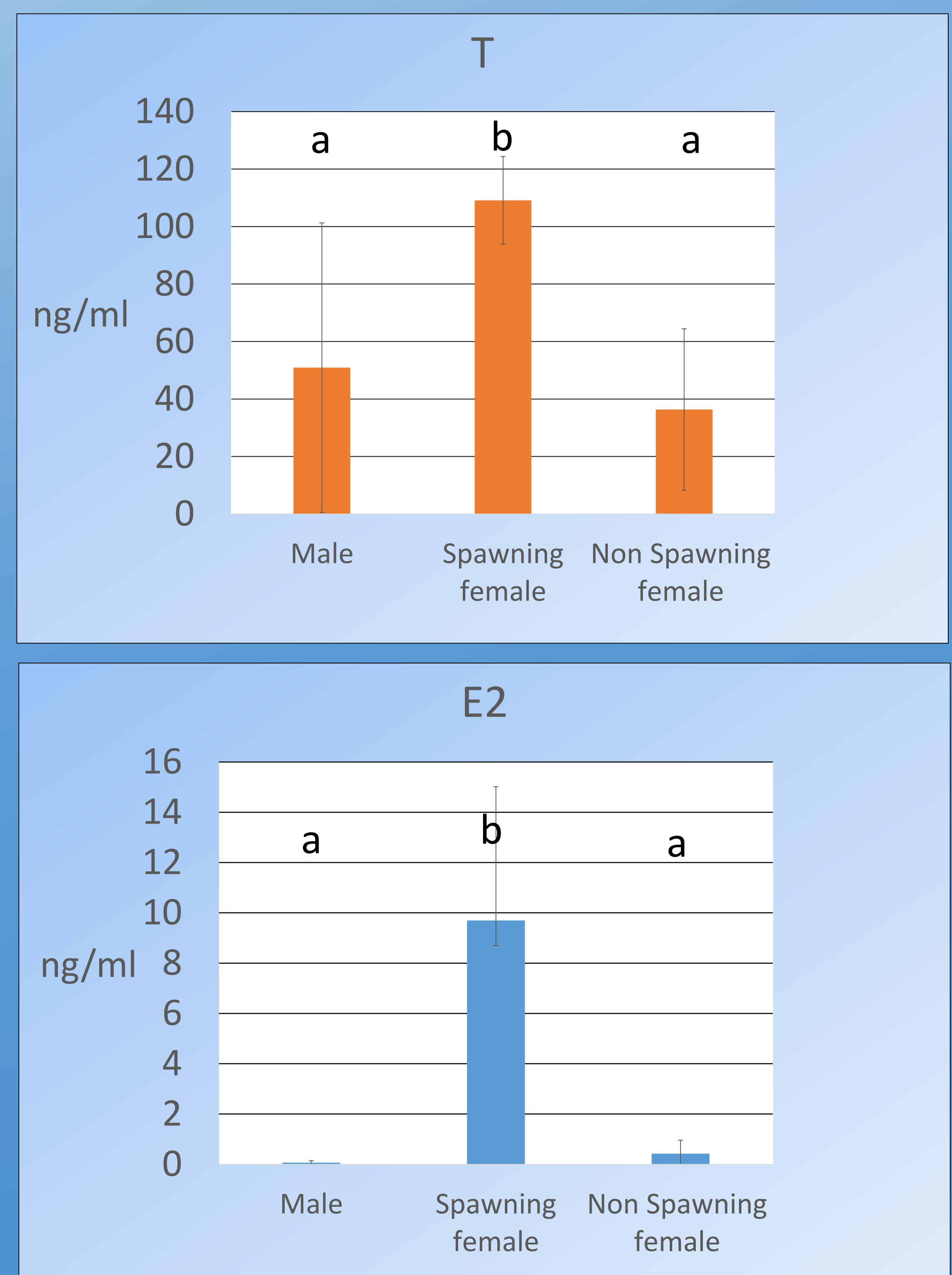


Figure 2. Testosterone and estradiol serum concentration of Adriatic sturgeons



Values denoted with different letters are statistically significant at $p < 0.05$. ANOVA and Student-Newman-Keuls post hoc test