

## OVARIAN STRUCTURE AND ANNUAL REPRODUCTIVE CYCLE OF SCORPAENA PORCUS

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### Abstract

The ovarian structure, the seasonal histology of the ovary, and various indices related to reproduction of *Scorpaena porcus* were analysed. The ovary showed many characteristics that are not typical for oviparous fishes: central ovarian stroma, pedunculate oocytes, scarcity and small size of cortical alveoli, thinness of the zona radiata, and a gelatinous matrix secreted during the maturation phase. The hepatic reserves were basically used for the final process of maturation. Spawning takes place between June and August.

**Keywords:** *Scorpaena porcus*, ovarian structure, reproductive cycle

The black scorpionfish (*Scorpaena porcus* L., 1758) is one of the most common species of the Scorpaenidae family. It is a sedentary species, living mainly in rocky and sea-grasses bottoms, at depths of up to 800 m (1). Although it is very abundant off the coasts of Catalonia and of commercial interest, there is not much information about its reproductive biology. The aim of the present work was to study the annual reproductive cycle of female black scorpionfish, on the basis of the ovarian structure, its histological changes, and various indices related to reproduction. The ovaries were classified according to the most developed type of oocyte (2).

The ovary of black scorpionfish shows a lot of peculiar characteristics that are not usual in oviparous species. Firstly, the ovary is of the cystovarian II-3 type (3), as it is surrounded by the ovarian wall and has the muscular-connective rachis and the blood vessels in its centre. Furthermore, the oocytes develop ovarian vascularized peduncles, considered in viviparous species to be protuberances of the placental or pseudo-placental connections (4). Finally, the cortical alveoli are scarce and with small size, and the thickness of the zona radiata is considerably less than that in other oviparous species. Both these characteristics have also been associated with viviparity in fishes (5). This special ovarian structure is similar to that described for another scorpionfish, *Scorpaena notata* (6).

The female reproductive cycle begun in September, when the entire ovary is in the previtellogenesis stage. In April, oocyte in cortical alveoli stage appeared for the first time, and in May begun the vitellogenic and maturation phase. From May to August, the internal epithelium of the ovarian wall developed many cytoplasmic projections which, together with the lamellar epithelium, secret a transparent and gelatinous ovarian fluid.

The annual development of gonadosomatic index (GSI = gonad weight/eviscerated weight x 100), hepatosomatic index (HSI = liver weight/eviscerated weight x 100) and condition factor (K = eviscerated weight/standard length x 100), is shown in figure 1. As is shown in this graphic, in the beginning of vitellogenesis the liver stored energetic reserves, which will be used for the final process of maturation. On the other hand, there were not any monthly significant differences for the condition factor (K) (ANOVA,  $p = 0,550$ ), although it has to be

pointed out the slightly decrease between June and July which is related to the demand of energy for the vitellogenesis process (7). The mean gonadosomatic index changed significantly throughout the year (ANOVA,  $p < 0,001$ ), showing a peak in the final maturation phase of the ovary. Based on GSI and the presence of hydrated oocytes and postovulatory follicles during June and July, spawning in black scorpionfish extends from June to August.

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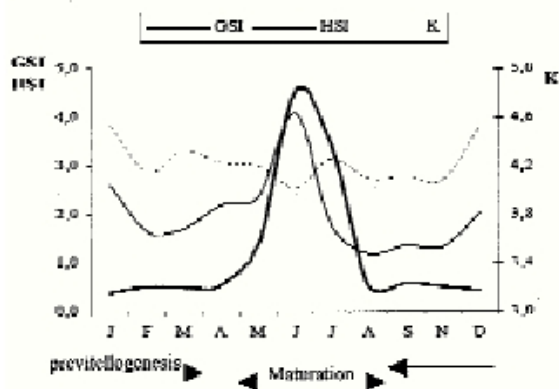


Fig.1. Annual development of gonadosomatic index (GSI), hepatosomatic index (HSI) and condition factor (K) related to the reproductive cycle of black scorpionfish.