GAMETE RELEASE AND GONAD SIZE IN THE SEA URCHIN *PARACENTROTUS LIVIDUS* FROM FOCA, TURKEY

Aysun Kose *, Aynur Lok , Sefa Acarli and Serpil Serdar
Ege University, Fishery Faculty, Department of Aquaculture, Izmir/TURKIYE - koseaysun@yahoo.com

Abstract
Specimens of the edible sea urchin, *Paracentrotus lividus*, were collected monthly from Foca, on the Aegean coast of Turkey, between February 2003 and January 2004. The length and weight of the gonad lop was measured. *P. lividus* maximal gamete release occurs in late winter. A significant relationship was found between gonad lop length and weight ($p \leq 0.05$).
Keywords : Aquaculture, Echinodermata, Aegean Sea, Mollusca.

Introduction
Paracentrotus (Lamarck) is the most abundant echinoid species in Mediterranean littoral community and plays an important role in the development of benthic macrophyties [1]. Sea urchin gonads, also know as roe or uni, are highly valued seafood commodities and are considered as delicacies in many parts of the world [2] thus they are popular. The aim of the present study was to determine peak time of gamete release and to observe the relationship between gonad lop length and weight.

Material and Method
In situ, specimens of *P. lividus* were collected from Foca between February 2003 to January 2004 (0380 43, 80, N; 0260 44, 00, E), Izmir. All individuals were dissected into two parts and five gonad lops were measured and weighted individually. The present study defines gamete release individuals as those with gametes that ooze from the gonads. The percentage of gamete releasing ındividuals were calculated using Microsoft Excel Program. Simple linear regression was applied to determine correlation between gonad lop length and gonad lop weight [3].

Results
In March, gamete releasing of sea urchins was not observed. An increase in the occurence gamete release in September-January was found. In January, when the most active gamete releasing was observed, a maximum peak was found (52%) (Fig. 1).

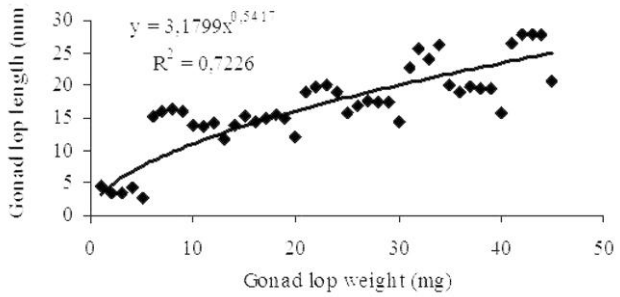

Fig. 1. A number of individuals *P. lividus* released gametes.

The regression analyse showed that there was a significant relationship between gonad lop weight and gonad lop length (r= 0.7226) (Fig. 2). Estimated b value was determined as 0.5417.

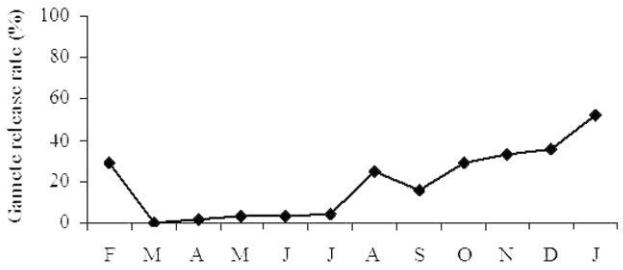

Fig. 2. The relationship between gonad lop weight and gonad lop length of *P. lividus*.

Discussion
In *Paracentrotus lividus*, gonadal growth occurs during the coldest months [4] and males and females aggregate for spawning, simultaneously release their gametes [5]. Spawning of *P. lividus* has been reported to occur either once or twice in a year [6]. On the other hand, the gamete release of *P. lividus* differs by as much as 4 weeks between years in Ireland [6]. In our study, although little gamete monthly release from gonads were observed throughout the year, the gamete release peaked (52%) once in a year only in late winter (January). It was observed that spawning only occurs during spring and early summer [7]. According to [8], *P. lividus* gonad growth and gametogenesis occurred throughout the year.
In this study, it was determined a significant realitionship between gonad lop weight and gonad lop length. This suggests that there is a direct proportion between these values. Despite the rich literature on gonad size of sea urchins [2, 3, 5], very few studies concerned gonad lop size.

References
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