

**ABUNDANCE AND SIZE FLUCTUATIONS IN THE DEEP-WATER SHRIMPS *ARISTAEOMORPHA FOLIACEA* (RISSO, 1827) AND *ARISTEUS ANTENNATUS* (RISSO, 1819) IN THE NORTH-WESTERN IONIAN SEA (MEDITERRANEAN SEA)**

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**Abstract**

Fluctuations in abundance and size in *Aristaeomorpha foliacea* and *Aristeus antennatus* were recorded in the North-western Ionian Sea during 1995-2005. Significant increases in both the biomass and density indexes were shown in *A. foliacea* while the abundance changes observed in *A. antennatus* did not show any significant trend. A significant increasing trend in the median value of carapace length was detected for both shrimps. Changes in the abundance of the two shrimps recorded during 2002-2004 seem to be due to delayed transient phenomenon effects.

*Keywords* : Crustacea, Decapoda, Demersal, Fisheries, Ionian Sea.

The abundance and size of the deep-water shrimps *Aristaeomorpha foliacea* (Risso, 1827) and *Aristeus antennatus* (Risso, 1816) were investigated within the framework of national [1] and international [2] trawl surveys carried out in the North-western Ionian Sea (Mediterranean Sea), from 1995 to 2005, with the aim of assessing the most important economic demersal resources.

Throughout the study period, 21 trawl surveys were carried out, during each spring and autumn, at depths between 300 and 800 m using a commercial vessel with standard equipment for trawling. The percentage of the positive hauls per survey ranged from about 30 to 84% for *A. foliacea* and from about 41 to 82% for *A. antennatus*.

The giant red shrimp *A. foliacea* showed highly variable abundance indexes, both in terms of biomass (BI in kg/km<sup>2</sup>) and density (DI in N/km<sup>2</sup>). The BI values were between 0.62 and 31.09 kg/km<sup>2</sup> and the DI values fluctuated from 46 to 2496 N/km<sup>2</sup>, both showing significant increasing trends evaluated with both parametric and non parametric correlations (p<0.05). In *A. antennatus* the BI values ranged from 4.22 to 25.74 kg/km<sup>2</sup> and the DI values varied between 214 and 1911 N/km<sup>2</sup>. However, the abundance changes observed in this shrimp did not show any significant trend.

During the period 2002-2004 an uncommon increase in abundance of *A. foliacea* together with a decrease in *A. antennatus* were recorded. Moreover, the decrease in *A. foliacea* during the last surveys (2005) coincided with a new increase in *A. antennatus* (Fig. 1).

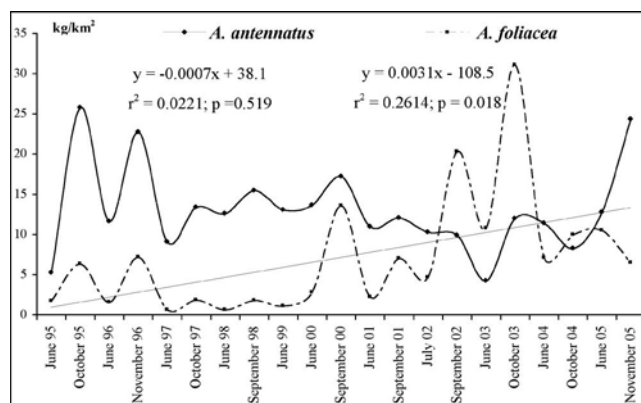


Fig. 1. Trend of biomass index (kg/km<sup>2</sup>) in *A. foliacea* and *A. antennatus* during 1995-2005 in the North-western Ionian Sea.

For both species, the carapace length (CL in mm) of the specimens varied largely throughout the study period. In fact, the calculated median values varied between 23 and 34 mm CL for *A. foliacea* and between 26 and 42 mm CL in *A. antennatus*. The observed increasing trends were significant in both shrimps (Fig. 2).

The significant increase in *A. foliacea* after 2000 seems to be due both to success in recruitment and to the stability of the fishing effort in the study area. The inverted abundance of the two red shrimps during 2002-2004 could be related to the change in hydrological conditions in the Ionian Sea

derived from the "transient" phenomenon [3]. Such conditions (warm water with high salinity) are considered favourable for *A. foliacea* but not for *A. antennatus* [4, 5]. In relation to the conclusion of the transient effects, *A. antennatus* was again found to be more abundant than *A. foliacea*.

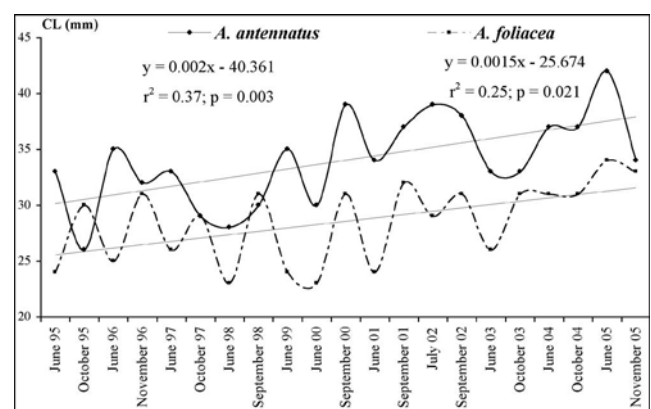


Fig. 2. Trend of median carapace length (CL mm) in *A. foliacea* and *A. antennatus* during 1995-2005 in the North-western Ionian Sea.

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