

Relationship between Monthly Shrimp Catch Rates and the Oceanography-Related Variables

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Abstract : Correlations between oceanographic variables and monthly catch rates of total shrimp and those of each of the major species (*Penaeus semisulcatus*, *Metapenaeus affinis* and *Parapenaeopsis styliifera*) showed significant differences for particular conditions. Catches of *P. semisulcatus* were basically positively correlated with temperature, i.e., the higher the temperature, the higher the catch rate, while those of *M. affinis* and *P. styliifera* were negatively correlated with temperature, i.e., high catch rates occurred in the low temperature waters. Thus, during the months January and April, *P. semisulcatus* preferred waters with high temperature, usually the offshore and southern areas, while *M. affinis* and *P. styliifera* preferred waters with low temperature, usually inshore and northern areas. The relationships between the catch rate of *P. semisulcatus* and salinity were not so clear. Results indicated that although salinity was one of the factors affecting the distribution of *P. semisulcatus*, it was not the principal factor, and impacts from other variables, such as temperature, might overshadow the correlation between the catch rates of *P. semisulcatus* and salinity. The relationship between shrimp catch rates and dissolved oxygen (DO) also showed mixed results. The catch rates of *M. affinis* increased with a decrease of surface DO in November 2013, but decreased with lower bottom DO in December. These results indicated that DO might be a factor affecting distributions of the shrimp; however; the true correlation between catch rate and DO might be easily overshadowed by other environmental variables. Catch rates of *P. semisulcatus* did not show any relationship with depth. *P. semisulcatus* is a migratory species and widely distributed in Kuwait's waters. During the shrimp season from July through December, *P. semisulcatus* occurs in almost all areas in Kuwait's waters irrespective of water depth. The catch rates of *M. affinis* and *P. styliifera*, however, showed clear relationships with depth. Both species had significantly higher catch rates in shallower waters, indicative of their restricted distribution.

Keywords : Kuwait, *Penaeus semisulcatus*, *Metapenaeus affinis*, *Parapenaeopsis styliifera*, Arabian gulf

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