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 stylifera) 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. stylifera 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. stylifera 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. stylifera, however, showed clear relationships with depth. Both species had significantly higher catch rates in shallower waters, indicative of their restricted distribution.

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