Effects of environmental factors on the fish catch and food resource partitioning of fish caught in the stilt fishery, Southern coastal belt, Sri Lanka.

By

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Abstract

Stilt fishing is a unique fishing method practiced only in the coastal belt of Southern Sri Lanka. This study was carried out to study the management strategies of stilt fishing and to investigate the relationship between fish catch with the environmental parameters in the fishing sites. Also the dietary habits and food partitioning of fish species caught by stilt fishing were investigated. This study was carried out from November 2007 to June 2008. Three fishing sites were selected at Kubalgama, Talpe and Goviyapana. The selected sites were weekly visited for data collection. The catch per unit effort (CPUE) data were recorded from fishermen. The tide data was recorded using a tide pole and the rainfall data was obtained from meteorological department. The phases of the moon on the sampling dates were also recorded. The plankton abundance of fishing sites during and after fishing time and in a control site was investigated using the plankton net. Gut contents of fish caught were identified at the laboratory by dissecting stomach. Food items were identified to the nearest taxonomical level.

The fishermen used *Alstonia macrophylla* and *Rhizophora* sp. to make stilt. They used pole and line to catch fish sitting on a stilt. Forty eight percent fishermen engaged in full time and fifty two percent were engaged in part time fishing. Stilt fishing rights transfers from generation to generation. The fishing season lasts from October of one year to July in the next year. They start fishing at dawn to 10h and evening from 14h until dusk. Stilt fishermen are not organized in to a fisheries society but they have their own management strategies. The leading trader imposes the restrictions and he buys all the fish from fishermen and sells to buyers. The use of nets at the fishing sites was not allowed. Only two species of fish *Herklotsichthys quadrimaculatus* and *Selar crumenopthalmus* were caught at all the sites. The

maximum length of *H. quadrimaculatus* and *S. crumenopthalmus* was 17 cm and 20 cm, respectively. The maximum weight of *H. quadrimaculatus* and *S.crumenopthalmus* was 70.2g and 25g, respectively. The condition factor of the *H. quadrimaculatus* at Kubalgama and Goviapana 1.01 and 0.81, respectively and the condition factor of the *S. crumenopthalmus* was at Talpe and Goviapana 0.60 and 0.37 respectively. The catch per unit effort (CPUE) in stilt fishery in three sites was significantly different (P> 0.05). There was no relationship between CPUE of stilt fishery with tidal fluctuation. There was a significant linear relationship for lunar phase with mean CPUE ($r^2 = 0.81$) in the first three quarter of the lunar phase. CPUE reduced in the fourth quarter of the lunar phase. There was a significant ($r^2 = 0.93$) positive linear relationship between mean monthly CPUE with mean monthly rainfall in stilt fishing. The *H. quadrimaculatus* fed on phytoplankton and zooplankton. *S. crumenopthalmus* mainly fed on zooplankton. Those two species had low dietary overlap (16.51%) and their niche breadth was significantly different (P< 0.05). *H. quadrimaculatus* preferred on diatom, dianoflagellate, calonoid copepods and unidentified phytoplankton particles. *S. crumenopthalmus* preferred on calonoid copepod, cyclopoid copepods, protozoea and nauplii. MDS ordination shows that there was a difference in plankton abundance during and after fishing time and the control site. This indicates that fish migration to fishing sites may be fully or partly governed by food abundance.