Seasonal variation in spider abundance in Kuttanad rice agroecosystem, Kerala, India (Araneae)

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Abstract: The present study attempts to improve the understanding of resident spider population and seasonal variations in their diversity in the rice agroecosystem of Kuttanad, one of the “Rice Bowls of Kerala”. The investigation was carried out for a period of 2 years from June 2001 to February 2003. Fortnightly sampling was done in four cropping seasons viz., Rabi 1 (June 2001 to September 2001), Kharif 1 (November 2001 to February 2002), Rabi 2 (June 2002 to September 2002) and Kharif 2 (November 2002 to February 2003). Spiders were collected from quadrates in 8 sites by hand-picking method. Different indices were calculated using the SPDIERS.BAS programme. Spider population in Rabi and Kharif seasons exhibited slightly different species abundance and composition. Among the 94 species of spiders collected during the study, 70 species of 17 families were recorded in the Rabi season and 94 species of 20 families in the Kharif season. All families except Amaurobiidae, Pisauridae and Pholcidae were present in both seasons. A total of 68 species had common occurrence in both crop seasons. Results indicate that the interaction of seasons on spider abundance/assemblage was significant for Shannon, Richness and Evenness indices, but non-significant for Simpson’s index. Population fluctuation of spiders showed insignificant difference between the two seasons.

Key words: diversity, abundance, spiders, rice agroecosystem, Kuttanad, India

Introduction

Spiders are potential biological control agents in agroecosystems (Riechert, Lockley 1984, Tanaka 1989, Bishop, Riechert 1990). Many researchers have provided descriptions of spider species abundance or composition in a variety of agroecosystems (Wisniewska, Prokopy 1997). Other researchers provided quantitative observations on the abundance of spiders (Carroll, Hoyt 1984) or recorded spider predation events (Riechert, Bishop 1990). A rice (Oryza sativa L.) field is a complex agroecosystem, containing many aquatic, semi-aquatic, and terrestrial species (Oraze et al. 1988). Spiders are well represented among the many predators found in this habitat. Numerous surveys of spiders have been conducted in the rice growing regions of Asia (Heong et al. 1991, Barrion, Litsinger 1995, Kim 1995, Barrion, Schoenly 1999). The spider fauna of the rice fields in India has been studied by many authors. Basic studies were carried out by Pathak, Saha (1999) and Bhattacharya (2000). However, it is a less common practice among workers to compare spider abundance at different stages of crop growth with the exception of the work of Banerji et al. (1993). Anbalagan, Narayanaswamy (1999) also analyzed the population fluctuation of spiders in paddy fields. Most of these studies were just limited to the identification of spiders and investigation of the dominant spider species. There has been no study on their seasonal variation and their ecological impact. Here we present the data that compare the abundance and richness of spiders between two cropping seasons and during different stages of the crop growth.

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