Biodiversity and Agro-ecosystem in Rice Paddy Landscape in Monsoon Asia

**Effects of organic cultivation practices on arthropod assemblages in paddy fields in Tochigi prefecture, Japan**

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The decline of biodiversity in agro-ecosystems is a serious issue worldwide. It is necessary to develop the practical management ways to facilitate both agricultural production and biodiversity conservation. In Japan, some sustainable agricultural practices (e.g., reduction of chemical fertilizer and chemical pesticides) have been carried out in rice cultivations. However, a little is known about the effects of these practices on agrobiodiversity. In this study, to evaluate the effects of organic cultivation practices on biodiversity in paddy fields, we compared species and abundance of arthropods between organic cultivation fields and conventional cultivation fields.

The study sites consist of inland paddy-field landscapes in the Kanto district, eastern Japan. We surveyed arthropods in four sites in Tochigi Prefecture biweekly from May to September 2008. Each site includes four study plots of paddy fields, two plots under organic cultivation (using no chemical pesticides and chemical fertilizers) and two under conventional cultivation (using chemical insecticides, fungicides, herbicides and fertilizers). To survey the arthropods, we carried out the following methods: (1) visual observation for counting arthropods on the rice plants, odonate adults and odonate nymphal sheds from which the adults emerged, (2) sweeping rice plants with a sweep net, (3) sweeping vegetation on levees and margins of dirt roads surrounding the study fields with a sweep net, (4) beating rice plants to drop arthropods onto a sticky board, and (5) dipping a D-flame net to collect aquatic insects in paddy water. Visual observation showed that adults of the odonate *Sympetrum frequens* and nymphal sheds of *S. frequens* and *S. infuscatum* were more abundant in the organic cultivation fields than in the conventional cultivation fields. Visual observation, sweeping rice plants and beating rice plants indicated higher species richness and higher abundance of spiders under organic cultivation, particularly *Tetragnatha, Pachygnatha*, lycosids and small linyphiids. Sweeping rice plants also suggested that small lady beetles *Scymnus* were more abundant in the organic fields. The species richness of aquatic insects was higher in the organic fields although dominant species were rather different among the study sites.