ABUNDANCE DYNAMICS OF SELECTED ARTHROPODS IN THE COURSE OF RICE PLANT GROWTH IN DIFFERENT RICE AGROECOSYSTEMS OF LEYTE, PHILIPPINES.

Master Thesis
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6. ABSTRACT

The cultivation of tropical Asian rice, which may have originated 9,000 years ago, represents an agricultural ecosystem of unrivaled ecological complexity. I undertook a study of the community ecology of irrigated tropical rice fields on Leyte, Philippines as a supporting study for biological/natural control of the insect pests, whose main purpose was to study the abundance of pests and its natural enemies (predators).

My study objectives reported on here were: 1)To record, identify and count individuals of selected insect species occurring in different stages of rice growth. Rice-feeding insects include leaf hoppers (Cicadellidae; *Nephotettix* species and others), plant hoppers (Delphacidae), bugs (Pentatomidae including *Scotinophara coarctata* and Coreidae), Coleoptera (mainly Chrysomelidae) and grasshoppers (Acrididae and Tettigoniidae). Natural enemies (predators) include dragonflies (Anisoptera), damselflies (Zygoptera), spiders (Araneae) and ladybird beetles (Coccinellidae). 2)To estimate community characteristics which include the proportional abundances of the taxa distinguished and predator/prey ratios in different stages of rice growth and in dependency of the use of insecticides, respectively. 3)To estimate the prey spectrum of web spiders based on identification of specimen caught in their webs, again comparing different stages of rice growth an sprayed vs. unsprayed fields. The data are used to establish sink food webs of orb spiders.

I performed a series of observational studies during the overall growth period of rice crop at two different experimental site, one was without insecticide treatment, the other treated with Roger insecticide (262.5 EC) once during the whole growth period of the rice crop.

My results showed that pest population developed at the tillering stage of the crop and abundance during the whole duration of crop of different pest families in succession. In a treated site Cicadellidae pests appeared during the early tillering was in high numbers during tillering stage and remain present during the whole duration of the crop. Coreidae and Alydidae simultaneously appeared and remained abundant together, Delphacids noticed fare abundance in early stage of the crop. Spiders and Coccinellidae found abundant from tillering stage until milking stage at the treated site, while in the untreated site Cicadellidae pest were found abundant during the

tillering stage of the crop, Alydidae, Coreidae found abundant during the milking and maturity stage of the crop. These results also gives correlation as when the pest population developed, the predator population soon became abundant because of abundance and availability of prey species. Web spiders developed during the milking stage of the crop.

Over all these results demonstrate the existence of a mechanism in tropical rice systems that support high levels of natural biological control. This mechanism depends on season long successional processes and interactions among a wide array of species, many of which been ignored as an important element in the rice ecosystem. My result support a management strategy that promotes the conservation of existing natural biological control through a major reduction in insecticide use, and corresponding increase in habitat heterogeneity.

However, the yield difference at both sites was slightly different indicating that site without insecticide yields less than as compared to the insecticide treated site, in addition to the other factors such as weeds or soil type etc.