THE STRIPED LYNX SPIDER, OXYOPES SALTICUS
[ARANEAE : OXYOPIDAE], IN AGROECOSYSTEMS

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The striped lynx spider, Oxyopes salticus Hentz, is among the numerically dominant predators in row crops in the United States and is described as a major predator of economically important pests. Because of its potential as a biocontrol agent of numerous pests, a review of the literature was undertaken. Eighty-eight publications are referenced, presenting the available data on O. salticus up to 1984.

KEY WORDS: Striped Lynx Spider, Oxyopes salticus, Oxyopidae predator, beneficial arthropod, natural enemy.

Insecticide resistance by some of the major insect pests has increased in recent years to such an extent that chemical control of these pests is difficult using the currently registered insecticides (Smith & Stadelbacher, 1978). Because of the problems associated with resistance, pesticide residues, restrictive regulations, and the ever-increasing costs of insecticide programs, insect control is in a period of rapid transition from an almost total reliance on chemical pesticides to an acceptance of integrated pest management (IPM). Of all the available tactics of IPM, none are more crucial to its success than biological control and none are more dependent on expert knowledge of the crop, its total environment, and of the biology and habitat requirements of the principal natural enemies of pests (Sailer, 1981).

Spiders have received considerable attention as potentially important predators of arthropod pests (Riechert & Lockley, 1984). The striped lynx spider, Oxyopes salticus Hentz, has received much of this attention. O. salticus is often the numerically dominant predator associated with row crops (Laster & Brazzel, 1968; Roach, 1980) and is described as a major predator of economically important pests (Whitcomb & Bell, 1964; McDaniel et al., 1981).

As IPM undergoes increased refinement, dependence on beneficial arthropods such as the striped lynx spider will increase in importance. This paper consolidates the available data on the taxonomy, life history, distribution, habitats, and predatory importance of O. salticus. We hope that the data presented here will aid economic entomologists in their attempts at implementing effective integrated pest management strategies.

SPIDERS IN THE AGROECOSYSTEM

Studies of spiders in crop habitats can be segregated into 3 general categories. The 1st and least useful category includes those studies that lump their data under the heading "spiders".
The 2nd category consists primarily of lists of spiders associated with a particular crop system. These lists add little to the knowledge of population dynamics but are useful when making geographical comparisons of the araneofauna in a particular agroecosystem. The 3rd and most useful category consists of detailed studies of some aspect(s) of the spider community in agricultural habitats.

The details of studies conducted within this 3rd category vary greatly. Seasonal distributions of the abundant spider families or species are reported by a number of authors (e.g. Howell & Pienkowski, 1971; LeSar & Unzicker, 1978; Culin & Rust, 1980). Results of studies on vertical distribution and behavior are reported for spiders in cotton (Whitcomb et al., 1963), grain sorghum (Bailey & Chada, 1968), and soybean (LeSar & Unzicker, 1978).

Whitcomb (1974) emphasized 4 important roles of spiders in the agroecosystem. First, spiders prey on destructive insects. Spiders cannot be overrated because of their high populations and the fact that various species have complementary niches in many different situations. For example, 1 pest may be preyed upon by 8 different species of spiders. Secondly, spiders are food for other predators. Hundreds of spider eggs are laid for every individual that matures. Ballooning deters cannibalism, but is only partially successful against other predatory arthropods. The coccinellid, Coleomegilla maculata (DeGeer), consumed 180 eggs of the spider Chiracanthium inclusum (Hentz) at a single site under the bracts of a cotton square (Whitcomb & Bell, 1964). Thirdly, since spiders tend to be general feeders, they also are natural enemies of most beneficial insects and destroy large numbers of parasitoids and predators. Fourthly, spiders compete with insect predators for prey. This is most important when prey are scarce. In Arkansas cotton fields, large populations of the striped lynx spider often contributed to low prey populations.

THE IMPORTANCE OF OXYOPES SPECIES IN THE AGROECOSYSTEM

The striped lynx spider (O. salticus) and most of its congeners play an active role in the suppression of many serious arthropod pests throughout the world. In Japan, an experiment was conducted in a Cryptomeria forest for the control of the cryptomerian leaf fly, Contarinia inouyei Mani. The release of approximately 45,000 lynx spiders of the species Oxyopes sertatus L. Koch in a test plot resulted in an overall reduction in damage of 53 % (Kayashtma, 1961). In taro fields O. sertatus fed on the tobacco cutworm, Spodoptera litura (F.), and was the numerically dominant predator (31.8 %) in mid-season when control of pest species was usually required (Nakasuji et al., 1973).

In India, Oxyopes pandae Tikader was a significant predator of the maize stalk borer, Chilo partellus (Swinhoe) (Singh et al., 1975; Sharma & Sarup, 1979). In laboratory tests it consumed significantly more C. partellus larvae than other predators examined. Additional studies in India have indicated similar results for other Oxyopes species in tobacco (Sitaramaiah et al., 1980), sapota (Sran & Sandhu, 1978), cotton (Rao et al., 1981) and Indigofera texmanii L., a shade tree in tea (Gope, 1981).

TAXONOMY

The lynx spiders (Oxyopidae) are a highly specialized family of the superfAMILY Lycosoidae. They are more unlike the ancestral stock than any other family in this complex. Most araneologists group the oxyopids with the Lycosidae, Agelenidae, Pisauridae, and Senoculidae. The lycosids, agelenids, and pisaurids are linked together by intermediate forms, whereas it is difficult to find intermediates that link the oxyopids with any of these 3 families. There are no obvious affinities based on morphological characteristics and reported habits between senoculids and the oxyopids. Although the oxyopids form a distinct line of evolution, their affinities unmistakably lie with the lycosoids (Brady, 1964).