

# A SHORT-TERM SURVEY OF COCCINELLIDAE (COLEOPTERA) ON OKRA IN THE SEMI-ARID REGION OF PERNAMBUCO

The Family Coccinellidae (Coleoptera) comprises around 6,000 species grouped in 360 genera, from which 90% of the species have predatory feeding habits (VANDENBERG, 2002). Coccinellidae has been the subject of thorough taxonomic, biological and ecological studies worldwide for several decades, especially due to their potential use in biological control programs (IPERTI, 1999). In Brazil, studies on their taxonomy and bionomics are mainly limited to the South-Southeast ecosystems, so that there is little information on Coccinellidae taxonomy, ecology and conservation in the Northeastern region. This is particularly true for the semi-arid region, which suffered a radical transformation in land use and agricultural practices after the development of irrigation projects from the mid-1970's. The area is now a major site for fruit and vegetable production for home market and export. The impact of such transformation on insect diversity and conservation has been largely ignored, and only recently have taxonomic and ecological studies in the region been addressed (see IANNUZZI et al., 2003).

As part of a survey on the predatory entomofauna survey in agro-ecosystems in the semi-arid region of Brazil, this study aimed at recording the occurrence of predatory Coccinellidae species in low-input crops. The benefit from this research was thought to be two-fold. Firstly, to expand the knowledge on the bionomics and distribution of described Coccinellidae species and, secondly, to identify species with potential as agents for natural biological control of two important local pests, the cotton aphid *Aphis gossypii* Glover (Hemiptera: Aphidae) and the *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae) biotype complex.

The experimental area was located in the municipality of Petrolina (09°09'S; 40°22'W), State of Pernambuco, Northeastern Brazil, in the semi-arid biome known as "caatinga". This is a type of dry savannah that covers approximately 800,000 km<sup>2</sup>, characterized by high temperature (average 35°C), low relative humidity, and a low and irregular rainfall (< 700 mm/yr) (FERNANDES & BEZERRA, 2000).

Coccinellidae adults were collected from an okra *Abelmoschus esculentus* L. (Moench) plantation located in an insecticide-free area (73 m x 78 m). Sampling was performed in seven occasions, separated by a five-day interval, in September and October 2003, between 9:00 and 13:00, for a 35-day period. Forty-eight plants chosen along twelve transects throughout the plot were thoroughly searched on each sampling day. Adults and larvae were collected using a portable aspirator and manually using soft forceps. Adults were immediately transferred to 70% alcohol glass vials, and preserved for further identification. When necessary, larvae were kept alive and reared in laboratory until the

emergence of the adult. Identification was carried out by using the Frank & Slosser (1996) key and by comparison with specimens held at the entomological collection of the Agriculture Research Center for the Semi-Arid Region (EMBRAPA-Semi Arido) in Petrolina. The specimens were deposited at the entomological collection of the Department of Zoology, at the Universidade Federal de Pernambuco (UFPE), in Recife.

Five hundred and fifty-four Coccinellidae specimens were registered during the field trial, belonging to six species and four genera (Table 1). *Cycloneda sanguinea* (Linnaeus) and *Scymnus* sp. 2 were the most abundant species. From the few studies available on Coccinellidae species in Northeastern Brazil (see BARBOSA et al., 2005), this is the first record of all four genera on okra plantations, despite the importance of this crop as human and animal food in the region.

*Cycloneda* and *Eriopsis* are well known genera in terms of distribution, bionomics and potential use as biological control agents (VANDERBERG, 2002). Comparatively, *Olla* and *Scymnus* are far less studied. The ash-gray ladybeetle, *Olla v-nigrum*, is an indigenous species found in arboreal plants in the USA (GORDON, 1985) and some countries in Latin America, including Argentina, Mexico, Paraguay and Brazil (MICHEL, 1992; BADO & RODRIGUEZ, 1997; MICHAUD, 2001). In Brazil, *O. v-nigrum* is assumed to be the most frequent species in the genus, and it has been often found in several agricultural sites in the South and Southeast regions (KATO et al., 1999). The genus *Scymnus* Kugelann includes over 600 described species and is widely distributed throughout the world (VANDENBERG, 2002). Although some species can be abundant, the diversity of morphological patterns hampers accurate specific identification, frequently relying on more elaborated analysis such as molecular tools or genitalia examination (IPERTI, 1999).

In this study, *O. v-nigrum* and both *Scymnus* species were observed feeding on *A. gossypii* on okra plants (Table 1), which emphasizes their potential contribution as biological control agents. For comparison, *O. v-nigrum* has been imported to Asia from tropical America as a biological control agent of psyllids, particularly *Heteropsylla cubana* Crawford (Hemiptera: Psyllidae) (MICHAUD, 2001). *Scymnus* species have also been regarded by Iperti (1999) as typically aphidophagous and coccidophagous, a feature that illustrates their potential as natural enemies of local hemipteran pests.

The lack of taxonomic studies in Northeastern Brazil has led to an underestimation of the local entomofauna. Recent results imply that despite harsh environmental conditions (to illustrate that, there was

no rainfall during the field trials), local insect diversity may be much richer than what has been assumed (IANNUZZI et al., 2003). More thorough surveys on less-studied host plants will expand our knowledge on predatory entomofauna and may help in understanding their role in pest control. This is particularly true for low-input crops like okra in the semi-arid region. Considering that human-caused disturbance is a major factor propelling local extinction and that predators are, *per se*, the first group to suffer the effects of such impact, more field studies are crucial for mapping the actual diversity of this group in the Brazilian semi-arid agro-ecosystems.

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**Table 1.** Species of predatory Coccinellidae (Coleoptera) collected in an insecticide-free okra plantation in Petrolina, State of Pernambuco, Brazil, in 2003.

<b>Subfamily</b>	<b>Tribe</b>	<b>Species</b>	<b>No. of specimens</b>	<b>Observed feeding on aphids and/or whiteflies ?</b>
Coccinellinae	Coccinellini	<i>Cycloneda sanguinea</i> (Linnaeus)	316	No
		<i>Cycloneda conjugata</i> (Mulsant)	2	No
		<i>Eriopis connexa</i> (Germar)	50	No
		<i>Olla v-nigrum</i> (Mulsant)	5	Yes
Scymninae	Scymnini	<i>Scymnus</i> sp. 1	90	Yes
		<i>Scymnus</i> sp. 2	131	Yes