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# BUTTERFLIES OF THE AGRICULTURAL EXPERIMENT STATION OF TROPICAL ROOTS AND TUBERS, AND SANTA ANA, CAMAGÜEY, CUBA: AN ANNOTATED LIST

**Douglas Manuel Fernández-Hernández**
Centro de Investigaciones de Medio Ambiente de Camagüey (CIMAC),
Ministerio de Ciencia, Tecnología y Medio Ambiente.
Cisneros # 105 entre Pobre y Ángel, Camagüey, C.P. 70100, CUBA
nvvr@finlay.cmw.sld.cu

**RESUMEN**

Durante seis años (nov. 1993 - nov. 1998, dic. 2000 -nov. 2001) se realizó un registro mensual de especies de mariposas diurnas, sus hábitats, fenología, conducta de los adultos, flores visitadas, larvas u oviposiciones en plantas hospederas, depredadores, en dos localidades del municipio Camagüey, provincia Camagüey, Cuba (Estación Experimental de Viandas Tropicales y Santa Ana), con el objetivo de determinar la fauna en esas localidades y discutir aspectos de la historia natural de cada especie. De las 111 especies registradas sólo 41 (37%) eran residentes permanentes (18 Hesperiidae, 9 Nymphalidae, 7 Lycaenidae, 6 Pieridae, and 1 Papilionidae). Entre las mariposas con insuficiente información sobre su distribución se encontró el hespérido *Achlyodes munroei*, que no se había colectado en Cuba desde hace más de 70 años y se comportó como un colonizador temporal. De las especies no residentes tres constituyeron nuevos registros para la provincia (*Junonia evarete, Vanessa cardui y V. atalanta rubria*). Se verificó un pico de abundancia y diversidad de especies desde junio hasta septiembre, en correspondencia con el período más húmedo; y otro pequeño en enero (segundo mes más seco), cuando existieron condiciones favorables en los hábitats y disponibilidad estacional de las fuentes de néctar y hospederos larvales. El 83% de la flora presente (182 especies) sirvió de alimento para los adultos o las larvas de las mariposas. *Acacia farnesiana*, *Cardiospermum microcarpum* y *Carica papaya* constituyeron nuevas plantas hospederas de *Ministrymon azia, Cyclargus a. amon* y *Ascia monuste*, respectivamente.
**Palabras Clave:** Cuba, depredadores, distribución, estudios locales, fenología, Lepidoptera (Papilionoidea), mariposas plagas, plantas hospederas, provincia Camagüey.

**ABSTRACT**

During six years (Nov. 1993 - Nov. 1998, Dec. 2000 - Nov. 2001) monthly occurrence of butterflies, habitats, phenology, adult behaviour, flowers visited, larvae or ovipositions on host plants, and predators were recorded at two sites in Camagüey municipality, Camagüey province, Cuba (The Agricultural Experiment Station of Tropical Roots and Tubers, and Santa Ana), with the purpose of determining the fauna of these localities and discussing aspects of the natural history of each species. Of 111 species recorded only 41 (37%) were permanent residents (18 Hesperiidae, 9 Nymphalidae, 7 Lycaenidae, 6 Pieridae, and 1 Papilionidae). Among the butterflies with insufficient information on distribution was found the skipper *Achlyodes munroei,* which only occurred as a temporary colonizer, and it had not been

collected in Cuba for over half a century. Three of the non-resident species *(Junonia evarete, Vanessa cardui* and *V. atalanta rubria)* were new province records. Peaks of abundance and species diversity occurred from June through September in correspondence with the wettest period, however, a small peak also took place in January (the second driest month) when habitats conditions were still favorable and rich seasonal nectar source and larval hosts were available. About 83% (182 species) of the plants present in the localities served as adult or larval resources for butterflies. *Acacia farnesiana*, *Cardiospermum microcarpum* and *Carica papaya* were new host plant records for *Ministrymon azia, Cyclargus a. amon* and *Ascia monuste*, respectively.
**Key Words:** Camagüey province, Cuba, distribution, host plants, Lepidoptera (Papilionoidea), local surveys, pest butterflies, phenology, predators.

## INTRODUCTION

The Agricultural Experiment Station of Tropical Roots and Tubers, and Santa Ana are at present the two most intensively sampled localities in the province of Camagüey, Cuba. Many of the new information on distribution and biology of the butterflies of the region, including novel records of larval host plants, have been previously known from these areas (Fernández 2001; 2004). However, with the importance of local studies for the better understanding of the geographical and ecological distribution of species (Fontenla 1989) there has not been published any account that specifically analyses each of the butterflies recorded at the mentioned sites. In the present paper the total butterflies is listed and their abundance, ecology, phenology, larval and adult resources, and predators are discussed. This is the first survey of its type for the province.

**Study area.** This study was carried out at the grounds of the Agricultural Experiment Station of Tropical Roots and Tubers (located in the area known as San José de Sao), and Santa Ana, the latter being contiguous to the southern boundary of the former. They are located NNW, at approximately 9.5 km from the City of Camagüey, at an elevation of 100 m, in The Camagüey municipality, Camagüey province, Cuba.

The cultivated crop fields that predominated at the station are those of sweetpotato (*Ipomoea batatas* (L.) Lam., Convolvulaceae), bananas and plantains (*Musa* spp., Musaceae) and cassava (*Manihot esculenta* Crantz., Euphorbiaceae), but pumpkin (*Cucurbita* sp., Cucurbitaceae) and grains (*Phaseolus* sp., Fabaceae; *Vigna* sp. Fabaceae; *Zea mays* L. Poaceae) are also found. The vegetation associated to crop plants, main buildings of the station, roadsides and pastures, is rich in *Bidens pilosa* L. (Asteraceae), *Macroptilium* spp. (Fabaceae), *Malachra* spp. (Malvaceae), *Phyla scaberrima* (A. C. Juss.) Mold. (Verbenaceae), *Sida* spp. (Malvaceae), *Spilanthes urens* Jacq. (Asteraceae), besides several species of Poaceae. The hedges consisting of *Gliricidia sepium* (Jacq.) Steud. (Fabaceae), the small tracts of secondary forests mainly populated by *Dichrostachys cinerea* (L.) Wight & Arn. (Fabaceae), *Guazuma*

*ulmifolia* Lam. (Sterculiaceae) and *Samanea saman* (Jacq.) Merr. (Fabaceae), and fallow fields represented favorable habitats due to the range of nectar sources, larval hosts, and shelter for some butterfly species. At Santa Ana, besides the hedges, among the plants which grow here are found *Calopogonium coeruleum* (Benth.) Hemsl. (Fabaceae), *Pisonia aculeata* L. (Nyctaginaceae), and *Varronia globosa* Jacq. ssp. *humilis* (Jacq.) Borhidi (Boraginaceae). The trees may be found either growing sparsely or forming secondary forests and groves, and include mango (*Manguifera indica* L., Anacardiaceae), *Citrus* spp. (Rutaceae), *Annona* spp. (Annonaceae) and *Gerascanthus laevigatus* (Lam.) Borhidi (Boraginaceae). This area may remain unchanged for long periods though overgrown weeds can be systematically controlled, especially during the dry season. The terrains of the station or Santa Ana have long been used for agricultural purposes and in the current area of the former there existed a sugar mill in the nineteenth century (station archives).

## MATERIALS AND METHODS

For collecting and observing butterflies at the station, emphasis was put in the more favorable habitats as those of the small tract of secondary forest close to a water dam, pasturelands contiguous to Santa Ana, and the gardens of the main buildings where stands of *Ixora* sp. (Rubiaceae) and *Jatropha integerrima* Jacq. (Euphorbiaceae) are planted, and these flowers were very attractive to pierids (larger species) and swallowtails; however, regular visits to the boundary between both areas, crop fields or even roadsides provided unusual butterfly records. At Santa Ana, the groves and pastures contiguous to the station were the more sampled habitats. Sporadically, the entire area of the former and about 300 m inwards at Santa Ana were visited. The study comprised six years, since November 1993 to November 1998, and during December 2000 to November 2001. Monthly species occurrence, habitats, adult behavior, adult nectaring/ larval food plants, starting and ending sampling time and predators were recorded. Precise dates of capture or sighting were given for butterflies from which only one or two specimens were recorded. For most species, the known status for the areas was summarized but important aspects on distribution, abundance, phenology or certain specimen features were discussed in more detail for some species. For the preparation of the butterfly list both areas were integrated though some vegetational characteristics between them (due to land use) favor the presence or abundance of a given species. The term resident is applied here to distinguish those species that permanently breed due to host plant and habitat availability. In the list, the species were categorized following Minno (1992) as abundant if they are likely to be encountered on a field trip to the study areas, occasional if they are irregularly present in low numbers, and uncommon if less

than five individuals are recorded from the localities. The butterfly families were arranged in taxonomic order according to Heppner (1998), and the species nomenclature and sequences followed Smith *et al*. (1994). Except for *Achlyodes munroei* Bell, whose identity was confirmed by Drs. Lee D. Miller and Jacqueline Y. Miller (Allyn Museum of Natural History, Sarasota, Florida, USA), identifications were made according to Smith *et al*. (1994).

## RESULTS

**Annotated list of species.** A list of 111 species was obtained as the result of more than 1350 collected or checked specimens of 73 genera of six of the seven butterfly families. Of the total, 41 species (37%) were residents of the study areas: 18 Hesperiidae, 9 Nymphalidae, 7 Lycaenidae, 6 Pieridae, and 1 Papilionidae. The other 70 species may be recorded as stray individuals, dispersing adults, or temporary colonizers.

**HESPERIIDAE**

***Phocides pigmalion batabano*** (Lucas 1857)

STATUS: Occasional in shaded habitats, along hedges, in open fields and on the main grounds. Adults perch on the underside of leaves or make short flights in the shade of bush and tree stands, or visit flowers. This species only occurs as strays or dispersing adults, and specimens have been reported for January, March-April, June, July, and October.

FLOWERS VISITED: *Citrus* sp., *Gliricidia sepium, Kosteletzkya pentasperma* (Bert.) Griseb. (Malvaceae), *Lantana camara* L. (Verbenaceae), *Macroptilium atropurpureum* (Moc. & Sess.) Urb. (Fabaceae), *Tournefortia hirsutissima* L. (Boraginaceae).

***Proteides mercurius sanantonio*** (Lucas 1857)

STATUS: Occasional in pastures, groves and shaded scrubby habitats. During the middle of the wet season in a particular year, this skipper may become numerous, probably the influx of individuals from nearby breeding sites. This species occurs as strays or dispersing adults, and specimens have been reported for every month.

HOST PLANTS: Observed ovipositing on *Lonchocarpus domingensis* (Turp. ex Pers.) DC. (Fabaceae).

FLOWERS VISITED: *Allium* sp. (Liliaceae), *Cestrum diurnum* L. (Solanaceae) *Chromolaena odorata* (L.) King et Robins. (Asteraceae), *Gliricidia sepium, Lantana camara, Malachra* sp. (Malvaceae), *Melochia pyramidata* L. var. *pyramidata* (Sterculiaceae), *Phyla scaberrima, Spilanthes urens, Tournefortia hirsutissima, Varronia globosa* ssp. *humilis*. Males also sip water from wet soil occasionally.

***Proteides maysi*** (Lucas 1857)

STATUS: Uncommon in open fields and grove margins. This species occurs as strays or dispersing adults, and specimens have been reported for June, August, and September.

FLOWERS VISITED: *Bidens pilosa, Cestrum diurnum, Phyla scaberrima*.

***Polygonus leo savigny*** (Latreille 1824)

STATUS: Occasional to abundant in shaded scrubby habitats, groves, pastures and on the main grounds. This skipper may be found in considerable numbers in the wet season in a particular year. On mid August until early September 1998 a peak of abundance was observed. This species breeds in the area in small

numbers, being immatures often abundant but, as in *Proteides mercurius*, a seasonal influx of individuals from nearby breeding sites also takes place and it accounts for the increase in population number. *P. leo* not only occurs as strays or dispersing adults but also as a temporary colonizer. Specimens have been reported for every month.
HOST PLANTS: Ova and larvae were found on *Lonchocarpus domingensis*.
FLOWERS VISITED: *Allium* sp., *Bidens pilosa, Casearia aculeata* Jacq. (Flacourtiaceae), *Cestrum diurnum, Citrus* sp., *Cyanthillium cinereum* (L.) Robins. (Asteraceae), *Gerascanthus laevigatus, Gliricidia sepium, Jatropha aethiopica* Müell. Arg (Euphorbiaceae), *Kosteletzkya pentasperma, Lagascea mollis* Cav. (Asteraceae), *Lantana camara, Malachra alceifolia* Jacq. (Malvaceae), *Melochia pyramidata* var. *pyramidata*, *Murraya paniculata* (L.) Jack. (Rutaceae), *Phyla scaberrima, Spilanthes urens, Stachytarpheta jamaicensis* (L.) Vahl (Verbenaceae), *Tournefortia hirsutissima, Turbina corymbosa* (L.) Raf. (Convolvulaceae), *Varronia globosa* ssp. *humilis*. Adults (most probably males) also sip water from wet soil occasionally.
PARASITOID: *Apanteles* sp. (Hymenoptera: Braconidae: Microgasterinae) reared from larvae on *Lonchocarpus*.

***Aguna asander haitiensis*** (Mabille & Boullet 1912)
STATUS: Uncommon in hedge margins and pastures. Two male specimens were taken on 20 June 1995 and 14 October 1998. This species only occurs as strays.
FLOWERS VISITED: *Kosteletzkya pentasperma, Spilanthes urens*.

***Urbanus proteus domingo*** (Scudder 1872)
STATUS: Abundant in pastures, along hedges and roadsides, in shaded scrubby habitats and on the main grounds. Males select suitable sites as territories and pursue passing butterflies or other skippers. Sometimes several of these males are involved in aerial interactions between them. This species occurs as a resident and may be numerous during the wet season with peaks of abundance in July or August, though numbers can still be recorded until October. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Centrosema molle* Mart. ex Benth. (Fabaceae), *Centrosema plumieri* (Turp. et Pers.) Benth. (Fabaceae), *Desmodium incanum* DC. var. *incanum* (Fabaceae), *Macroptilium atropurpureum* (Moc. & Sess.) Urb. (Fabaceae), *Macroptilium lathyroides* (L.) Urb. (Fabaceae), *Mucuna pruriens* (L.) DC. (Fabaceae), *Vigna vexillata* (L.) A. Rich. (Fabaceae), and cultivated *Vigna* species.
FLOWERS VISITED: *Allium* sp., *Anoda acerifolia* DC. (Malvaceae), *Asclepias curassavica* L. (Asclepiadaceae), *Blechum pyramidatum* (Lam.) Urb. (Acanthaceae), *Boerhavia erecta* L. (Nyctaginaceae), *Calopogonium coeruleum, Catharanthus roseus* (L.) G. Don (Apocynaceae), *Cestrum diurnum, Citharexylum fruticosum* L. (Verbenaceae), *Citrus* sp., *Chromolaena odorata, Gliricidia sepium, Jatropha aethiopica, Jatropha integerrima, Kosteletzkya pentasperma, Lagascea mollis, Lantana camara, Macroptilium atropurpureum, Macroptilium lathyroides, Malachra* spp., *Momordica charantia* L. (Cucurbitaceae), *Pelthophorum ferrugineum* Benth. (Fabaceae), *Phyla scaberrima, Portulaca oleracea* L. (Portulacaceae), *Rauvolfia tetraphylla* L. (Apocynaceae), *Salvia micrantha* Vahl (Lamiaceae), *Spilanthes urens, Stachytarpheta jamaicensis, Stemodia durantifolia* (L.) Sw. (Scrophulariaceae), *Tournefortia hirsutissima, Turbina corymbosa, Varronia globosa* ssp. *humilis*, *Vigna vexillata*. Males sip water from wet soil and feed on bird droppings.
PREDATOR: A *Xysticus* (?) sp. (Araneae: Thomisidae) was found feeding on a female adult on *Malachra*.

***Urbanus dorantes santiago*** (Lucas 1857)
STATUS: Abundant and similar in choice of habitats and phenology as *U. proteus*. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Observed ovipositing on *Alysicarpus vaginalis* (L.) DC. (Fabaceae), *Centrosema virginianum* (L.) Benth. (Fabaceae), *Desmodium triflorum* (L.) DC. (Fabaceae) and *Macroptilium*

*atropurpureum*. Several larvae obtained by a captured adult female fed on *Centrosema virginianum* and strongly rejected *C. plumieri*.
FLOWERS VISITED: *Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Cestrum diurnum, Citrus* sp., *Chromolaena odorata, Clematis dioica* L. (Ranunculaceae) (male flower), *Desmodium scorpiurus* (Sw.) Desv. var. *scorpiurus* (Fabaceae), *Euphorbia heterophylla* L. (Euphorbiaceae), *Gerascanthus laevigatus, Gliricidia sepium, Ipomoea batatas, Kosteletzkya pentasperma, Lagascea mollis, Lantana camara, Lonchocarpus domingensis, Macroptilium atropurpureum, Malachra* spp., *Malvastrum coromandelianum* (L.) Garcke (Malvaceae), *Melochia nodiflora* Sw. (Sterculiaceae), *Melochia pyramidata* var. *pyramidata, Phyla scaberrima, Spilanthes urens, Tournefortia hirsutissima, Tridax procumbens* L. (Asteraceae), *Varronia globosa* ssp. *humilis*. Adults (probably males) sip water from wet soil. Once observed feeding on fresh human urine and on bird droppings

***Astraptes anaphus anausis*** (Godman & Salvin 1896)
STATUS: Uncommon in open fields at the station. This species only occurs as strays, and specimens have been reported for January, March, and December.
FLOWERS VISITED: *Bidens pilosa, Calopogonium coeruleum, Chromolaena odorata*.

***Cabares potrillo potrillo*** (Lucas 1857)
STATUS: Uncommon in shaded shrubby habitats and grove clearings. This species occurs as strays, and specimens have been reported for January and February.
HOST PLANTS: A last instar larva was found on *Priva lappulacea* (L.) Pers. "(Verbenaceae)"

***Achlyodes mithridates papinianus*** (Poey 1832)
STATUS: Occasional in grove margins, along roadsides and hedges, and in open sites. Once observed in the gardens of the main grounds. Though adults were seen infrequently, larvae have been abundant during the dry season. This species not only occurs as strays or dispersing adults but as a temporary colonizer. Specimens have been reported for every month but April, May, and October.
HOST PLANTS: Larvae were found on *Citrus limon* (L.) Burm. f., *(*Rutanaceae*) Zanthoxylum elephantiasis* Macf. (Rutaceae) and *Zanthoxylum martinicensis* (Lam.) DC. *(*Rutanaceae*)*
FLOWERS VISITED: *Bidens pilosa, Calopogonium coeruleum, Chromolaena odorata, Clematis dioica* (male flowers), *Gerascanthus laevigatus, Gliricidia sepium, Ixora* sp., *Lantana camara, Phyla scaberrima, Spilanthes urens, Tournefortia hirsutissima*.

***Achlyodes munroei*** Bell 1956
STATUS: A male and a female specimen were obtained from larvae found in leaf shelters of *Zanthoxylum martinicensis* in July 2000 at Santa Ana (both emerged as adults on 19 August), and another male adult was taken at the same site on 19 November 2001 (Fernández 2004). The species occurs as a temporary colonizer but its status in the area must be reassessed given its similarity with *A. mithridates* with which can be easily confused and sight records of the latter could have been *A. munroei*.

***Gesta gesta gesta*** (Herrich-Schäffer 1863)
STATUS: Occasional in open scrubby sites and along roadsides. Once observed in the main grounds. Males fly around the larval food plant patches probably searching for emerging females. When adults perch open-winged on dead plant twigs resemble dry leaves. This species occurs as a temporary colonizer. The availability of the larval host could be a limiting factor in a particular year. Although immatures may be easily found, adults are infrequently seen. Specimens have been reported for January, April, and June-December.

HOST PLANTS: Ova and larvae were found on *Indigofera suffruticosa* Mill. (Fabaceae).
FLOWERS VISITED: *Calopogonium coeruleum, Phyla scaberrima, Spilanthes urens, Varronia globosa* ssp. *humilis*. Once observed sipping water from wet soil.

***Ephyriades brunnea brunnea*** (Herrich-Schäffer 1864)
STATUS: Occasional in pastures, along roadsides, in shaded scrubby sites and on the main grounds. This species not only occurs as strays or dispersing adults but as temporary colonizer, and specimens have been reported for every month but October-December.
HOST PLANTS: Larvae were found on *Stigmaphyllon sagraeanum* A. Juss. (Malpighiaceae).
FLOWERS VISITED: *Calopogonium coeruleum, Melochia pyramidata* var. *pyramidata, Phyla scaberrima, Rauvolfia tetraphylla, Sida* sp., *Tournefortia hirsutissima, Varronia globosa* ssp. *humilis*. Males also sip water from wet soil occasionally.

***Erynnis zarucco*** (Lucas 1857)
STATUS: Occasional to abundant in pastures, hedges and crop fields, often near larval food plant patches. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Gliricidia sepium, Indigofera suffruticosa, Sesbania bispinosa* (Jacq.) W. Wight (Fabaceae), and *Sesbania cannabina* (Retz.) Pers. (Fabaceae).
FLOWERS VISITED: *Allium* sp., *Bidens pilosa, Calopogonium coeruleum, Chromolaena odorata, Lagascea mollis, Macroptilium atropurpureum, Macroptilium lathyroides, Spilanthes urens, Teramnus uncinatus* (L.) Sw. (Fabaceae). Males also sip water from wet soil on occasions.

***Pyrgus oileus oileus*** (Linnaeus 1767)
STATUS: Abundant along roadsides and hedges, in pastures, scrubby habitats, groves and on the main grounds. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Malvastrum coromandelianum, Sida rhombifolia* L. (Malvaceae) and *Sida spinosa* L. (Malvaceae).
FLOWERS VISITED: *Alternanthera pungens* H.B.K. (Amaranthaceae), *Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Desmodium incanum* var. *incanum, Emilia sonchifolia* (L.) DC. (Asteraceae), *Kallstroemia maxima* (L.) T. & G. (Zigophyllaceae), *Malvastrum americanum* (L.) Torrey (Malvaceae), *Malvastrum coromandelianum, Melochia pyramidata* var. *pyramidata, Momordica charantia, Phyla scaberrima, Portulaca oleracea, Salvia micrantha, Sida* spp., *Spermacoce laevis* (Griseb.) Wr. (Rubiaceae), *Spilanthes urens, Stachytarpheta jamaicensis*. Males also sip water from wet soil and feed on cow droppings.

***Pyrrhocalles antiqua orientis*** Skinner 1920
STATUS: Occasional along grove margins, in shady paths and scrubby sites. This species not only occurs as strays or dispersing adults but as a temporary colonizer. Specimens have been reported for March, and August-October.
HOST PLANTS: Larvae were found on *Roystonea regia* (H.B.K.) O. F. Cook (Arecaceae).
FLOWERS VISITED: *Bidens pilosa, Malachra* sp.

***Perichares philetes philetes*** (Gmelin 1790)
STATUS: Abundant in humid shaded habitats. Adults perch, with head upwards, in low vegetation most of the day and may actively be seen visiting flowers early in the day, cloudy mornings and during overcast periods. In hot hours they also venture for nectaring but readily take cover in suitable sites. This species occurs as a resident and may be numerous during August and September. Specimens have been reported for every month.

HOST PLANTS: Larvae were found on *Bambusa* sp. (Poaceae), *Brachiaria mutica* (Forsk.) Stapf (Poaceae), *Panicum maximum* Jacq. (Poaceae), and *Paspalum virgatum* L. (Poaceae). On February 2001 one larva was found on the leaflets of a very young individual of the areca palm, *Chrysalidocarpus lutescens* (Bory) H. Wendl. (Arecaceae), planted on the main grounds of the station.
FLOWERS VISITED: *Allamanda cathartica* L. (Apocynaceae), *Carica papaya* L. (Caricaceae), *Catharanthus roseus, Cucurbita* sp., *Ipomoea batatas, Ipomoea tiliacea* (Willd.) Choisy (Convolvulaceae), *Malachra alceifolia, Momordica charantia, Musa* sp., *Pentalinon luteum* (L.) Hansen & Wunderlin (Apocynaceae), *Ruellia nudiflora* Urb. (Acanthaceae), *Ruellia tuberosa* L. (Acanthaceae), *Stachytarpheta jamaicensis, Turbina corymbosa, Vigna vexillata*.
PREDATOR: A male adult was found trapped in the web of a *Neoscona arabesca* (Wackenaer) (Araneae: Araneidae) on *Malachra*.

***Synapte malitiosa malitiosa*** (Herrich-Schäffer 1865)
STATUS: Abundant but local in humid shaded habitats at the station. Adults perch on low grass blades or on bare ground in small groups, usually in the company of the next species. Late in 1998 the area occupied by the colony, a seasonally flooded tract of secondary forest near a water dam, was cleared for agricultural use thus destroying the habitat. By June 2001 the area had already regrown and resembled the former vegetational structure but the species was not seen. It was not until 6 September 2001 that a fresh individual was observed at the same site and on 13 November the adults were fairly common and larvae and pupal exuviae found. The species is resident and become numerous at the end of October to January. Specimens have been reported for every month.
HOST PLANTS: Larvae and pupae were found on *Panicum maximum*.
FLOWERS VISITED: *Bidens pilosa*, *Calopogonium coeruleum*, *Ipomoea meyeri* (Spreng.) G. Don (Convolvulaceae), *Malachra* spp., *Phyla scaberrima*.
PREDATOR: An unidentified crab spider (Thomisidae) was found feeding on a male adult at flowers. An ant species was found attacking and feeding on a pupa on *Panicum*.

***Cymaenes tripunctus*** (Herrich-Schäffer 1865)
STATUS: Abundant in humid shaded habitats, but also venturing into open sunlit fields and crop fields. Adults may be actively seen nectaring early in the day or in cloudy mornings while in hot hours they take cover, in groups, in suitable sites. This species occurs as resident and may become numerous at the end of September to January. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Bambusa* sp., *Brachiaria mutica*, *Echinochloa colona* (L.) Link (Poaceae), *Panicum fasciculatum* Sw. (Poaceae), *Panicum maximum*, *Panicum reptans* L. (Poaceae), *Paspalum virgatum*, *Rottboellia cochinchinensis* (Lour.) Clayton (Poaceae) and *Sorghum sudanense* (Piper) Stapf in Prain (Poaceae).
FLOWERS VISITED: *Anoda acerifolia*, *Blechum pyramidatum*, *Calopogonium coeruleum*, *Catharanthus roseus*, *Centrosema virginianum*, *Chromolaena odorata*, *Citrus* sp., *Ipomoea batatas*, *Ipomoea setifera* Poir. (Convolvulaceae), *Ipomoea tiliacea*, *Jasminum fluminense* Vell. (Oleaceae), *Kallstroemia maxima*, *Malachra* spp., *Momordica charantia*, *Pentalinon luteum*, *Phyla scaberrima*, *Plumbago scandens* L. (Plumbaginaceae), *Salvia micrantha*, *Spilanthes urens*, *Stachytarpheta jamaicensis*, *Trianthema portulacastrum* L. (Aizoaceae), *Turbina corymbosa*, *Vigna vexillata*.
PREDATORS: Two unidentified crab spiders (Thomisidae) were found feeding on adults on *Ipomoea* and on *Vigna*.

***Rhinthon cubana*** (Herrich-Schäffer 1865)
STATUS: This skipper was firstly noticed by its immatures in late December 1995 and January 1996 at Santa Ana, but again on February 2001 a single mature larva was found on the main grounds of the station.

Two female adult specimens were taken on 8 November 1996 and 29 October 1997, being the latter recently emerged. This species occurs as a temporary colonizer notably since the end of the wet season to February. Though larvae may be relatively easy to find, the adults are rarely seen.
HOST PLANTS: One mature larva was found on *Canna* sp. (Cannaceae). Larvae and pupae were found on *Maranta arundinacea* L. (Marantaceae).

***Oarisma nanus*** (Herrich-Schäffer 1865)
STATUS: This species was found with certain abundance during April 1994 at the station. A colony was associated to grasses (mainly *Brachiaria mutica*) growing in a plantain field, and there was shade and humidity. Additional specimens were also recorded in another nearby plantation in May, September and December that year and January, March and June 1995. These fields were subsequently used for other crops thus destroying the habitat. In more recent times it has not been seen again. This species probably colonizes the station in some years. Its discovery in the area is most interesting knowing that is an inhabitant of pinewoods and other localities on lateritic and serpentine soils (Alayo & Hernández 1987).
FLOWERS VISITED: *Chromolaena odorata*.

***Hylephila phyleus phyleus*** (Drury 1773)
STATUS: Abundant in pastures, along roadsides, in crop fields, and scrubby habitats. This species occurs as a resident and through may be quite common during the wet season it has never been found in great numbers. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Cynodon dactylon* (L.) Pers. (Poaceae). Observed ovipositing on *Dichanthium* sp. (Poaceae) and *Eleusine indica* (L.) Gaertn. (Poaceae). The females often oviposit on sections of dead plants on wet soil.
FLOWERS VISITED: *Bidens pilosa*, *Blechum pyramidatum*, *Calopogonium coeruleum*, *Cestrum diurnum*, *Chromolaena odorata*, *Citrus* sp., *Cucumis dipsacus* Ehrenb & Spach. (Cucurbitaceae), *Cucumis sativus* L. (Cucurbitaceae), *Gliricidia sepium*, *Ipomoea setifera*, *Ipomoea tiliacea*, *Jatropha aethiopica*, *Kallstroemia maxima*, *Macroptilium atropurpureum*, *Malachra alceifolia*, *Melochia pyramidata* var. *pyramidata*, *Merremia umbellata* (L.) Hall. f. (Convolvulaceae), *Phyla scaberrima*, *Portulaca oleracea*, *Spilanthes urens*, *Tournefortia hirsutissima*, *Turbina corymbosa*.
PREDATOR: A *Parastephanops echinatus* (Banks) (Araneae: Thomisidae) was found feeding on a male adult on *Malachra*.

***Atalopedes mesogramma mesogramma*** (Latreille 1823)
STATUS: Occasional to abundant in pastures, along hedges and roadsides, in the weedy vegetation near crop fields and scrubby habitats. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Observed ovipositing on *Cynodon dactylon*, *Dichanthium* sp. and *Paspalum conjugatum* Berg. (Poaceae). One fifth instar larva was found on the latter.
FLOWERS VISITED: *Allium* sp., *Anoda acerifolia*, *Bidens pilosa*, *Blechum pyramidatum*, *Bouchea prismatica* (L.) Ktze. (Verbenaceae), *Calopogonium coeruleum*, *Cestrum diurnum*, *Chromolaena odorata*, *Citrus* sp., *Gliricidia sepium*, *Lagascea mollis*, *Ludwigia* sp. (Onagraceae), *Macroptilium atropurpureum*, *Malachra* sp., *Melochia pyramidata* var. *pyramidata*, *Pentalinon luteum*, *Phyla scaberrima*, *Sida acuta* Burm. f. (Malvaceae), *Sida* sp., *Spilanthes urens*, *Stachytarpheta jamaicensis*, *Tagetes erecta* L. (Asteraceae), *Tournefortia hirsutissima*, *Turbina corymbosa*, *Varronia globosa* ssp. *humilis*. A male was observed feeding on a bird dropping on a leaf in a grove.

***Polites baracoa baracoa*** (Lucas 1857)
STATUS: Abundant in pastures, roadsides and crop fields. When adults remain perched or thermoregulate

on bare ground or stones become inconspicuous. This species occurs as a resident and on 28 June 2001 it was quite numerous along sunny furrows separating cassava plots at the station. Specimens have been reported for every month.
FLOWERS VISITED: *Anoda acerifolia, Bidens pilosa, Centrosema virginianum, Cestrum diurnum, Chromolaena odorata, Clematis dioica* (male flower), *Corchorus siliquosus* L. (Tiliaceae)*, Cyanthilium cinereum, Ipomoea tiliacea, Jatropha aethiopica, Malachra* spp. *Melochia pyramidata* var. *pyramidata*, *Merremia umbellata, Phyla scaberrima, Portulaca oleracea, Rhynchosia minima* (L.) DC. var. *minima* (Fabaceae)*, Sida* sp., *Spilanthes urens, Tridax procumbens, Vigna vexillata*.

***Wallengrenia misera*** (Lucas 1857)
STATUS: Occasional to abundant in pastures, along roadsides, groves and shaded scrubby sites. This species occurs as a resident, and specimens have been reported for every month..
HOST PLANTS: Observed ovipositing on *Dichanthium* sp.
FLOWERS VISITED: *Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Cestrum diurnum, Chromolaena odorata, Clematis dioica* (male flower), *Emilia sonchifolia, Gliricidia sepium, Ipomoea tiliacea, Jasminum fluminense, Kallstroemia maxima, Lagascea mollis, Lantana camara, Malachra* sp., *Momordica charantia, Pentalinon luteum, Phyla scaberrima, Sida* sp., *Spilanthes urens, Stachytarpheta jamaicensis, Tournefortia hirsutissima, Tridax procumbens, Turbina corymbosa*.

***Choranthus radians*** (Lucas 1857)
STATUS: Abundant in shady habitats, pastures and along roadsides and hedges. This species occurs as a resident, and specimens have been reported for every month.
FLOWERS VISITED: *Bidens pilosa, Calopogonium coeruleum, Catharanthus roseus, Centrosema virginianum, Ipomoea batatas, Ipomoea setifera, Ipomoea tiliacea, Lagascea mollis, Malachra* sp., *Pentalinon luteum, Phyla scaberrima, Spilanthes urens, Stachytarpheta jamaicensis, Turbina corymbosa, Vigna vexillata*.

***Euphyes cornelius cornelius*** (Latreille 1824)
STATUS: Occasional to abundant in pastures, flowering weedy sites near crop fields and scrubby habitats. This species occurs as a resident, and specimens have been reported for every month.
FLOWERS VISITED: *Allium* sp., *Bidens pilosa, Calopogonium coeruleum, Cestrum diurnum, Chromolaena odorata, Gliricidia sepium, Jatropha aethiopica, Lagascea mollis, Lantana camara, Malachra* sp., *Phyla scaberrima, Pisonia aculeata, Spilanthes urens, Tournefortia hirsutissima, Turbina corymbosa, Varronia globosa* ssp. *humilis*.

***Asbolis capucinus*** (Lucas 1857)
STATUS: Occasional to abundant in flowery crop fields, scrubby sites and near patches of the larval food plants. Both sexes perch on bare ground or low vegetation along coconut rows planted on the main grounds and males pursue passing butterflies. This species occurs as a resident, and specimens have been reported for every month but April.
HOST PLANTS: Larvae were found on *Cocos nucifera* L. (Arecaceae), *Chrysalidocarpus lutescens*, *Roystonea regia* and *Veitchia merrillii* (Becc.) Moore (Arecaceae).
FLOWERS VISITED: *Allium* sp., *Catharanthus roseus*, *Cestrum diurnum, Chromolaena odorata, Citrus* sp., *Cucurbita* sp., *Ipomoea batatas*, *Ipomoea tiliacea, Malachra* sp., *Pentalinon luteum, Ruellia nudiflora, Stachytarpheta jamaicensis*.

***Lerodea eufala*** (W. H. Edwards 1869)
STATUS: Abundant in open habitats, pastures, along roadsides and in weedy sites around crop fields. Individuals fly and rest on bare ground at full sun but at mid-day they also take cover, perching on grass

blades, beneath the shady understory of tree stands. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Brachiaria mutica*, *Echinochloa colona* and *Sorghum sudanense*. Observed ovipositing on *Dichanthium* sp.
FLOWERS VISITED: *Allium* sp., *Anoda acerifolia, Blechum pyramidatum, Calopogonium coeruleum, Ipomoea tiliacea, Kosteletzkya pentasperma, Lagascea mollis, Macroptilium atropurpureum, Macroptilium lathyroides, Malachra* sp., *Melochia pyramidata* var. *pyramidata, Merremia umbellata, Phyla scaberrima, Sida* sp., *Spilanthes urens, Vigna vexillata*.

***Calpodes ethlius*** (Stoll 1782)
STATUS: Adults were infrequently seen but immatures have been abundant in local patches of the larval host plants on the main grounds and at Santa Ana. Adults perched on leaves of the hosts and pursued passing butterflies on occasions. This species occurs as a frequent temporary colonizer. Specimens have been reported for May, July, August, and October-December.
HOST PLANTS: Ova, larvae and pupae were found on *Canna* sp. and *Maranta arundinacea*.
FLOWERS VISITED: *Allamanda cathartica, Bidens pilosa, Vigna* sp.
PREDATOR: An unidentified crab spider was feeding on a larva on *Canna*.

***Panoquina sylvicola sylvicola*** (Herrich-Schäffer 1865)
STATUS: Abundant in pastures, along hedges and roadsides, and in scrubby habitats. Although adults are seen mostly at full sun they also take cover in shady tree understories and thicket margins at mid-day and at other times of the day. This species occurs as a resident and may become numerous during the wet season (July-October). Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Brachiaria mutica*, *Dichanthium* sp., *Panicum maximum*, *Sorghum halepense* (L.) Pers. (Poaceae), and *Sorghum sudanense*.
FLOWERS VISITED: *Bidens pilosa, Calopogonium coeruleum, Cestrum diurnum, Chromolaena odorata, Citrus* sp., *Clematis dioica* (male flower), *Gerascanthus laevigatus, Gliricidia sepium, Ipomoea batatas, Ipomoea tiliacea, Jatropha aethiopica, Kosteletzkya pentasperma, Malachra* sp., *Melochia pyramidata* var. *pyramidata, Mikania micrantha* H.B.K. (Asteraceae), *Phyla scaberrima, Portulaca oleracea, Sida acuta, Spilanthes urens, Tournefortia hirsutissima, Tridax procumbens, Turbina corymbosa, Varronia globosa* ssp. *humilis*. Adults also sip water from wet soil and feed on bird droppings.
PARASITOID: Several pupae of an unidentified parasitic wasp were found on a dead pupa of the skipper on *Dichanthium*.

***Panoquina corrupta*** (Herrich-Schäffer 1865)
STATUS: Occasional in pastures and shaded scrubby habitats. This species occurs as strays or dispersing adults, and specimens have been reported for January, and June-September.
FLOWERS VISITED: *Bidens pilosa, Spilanthes urens*.

***Panoquina ocola ocola*** (W. H. Edwards 1863)
STATUS: Abundant in pastures, along roadsides and scrubby habitats. As *Panoquina sylvicola*, the adults can also be found resting in shady sites at mid-day and at other times of the day. This species is resident, and may be numerous during the wet season (July-October), but at the end of the dry season (March-April) the butterfly is almost unrecorded. Specimens have been reported for every month but April.
FLOWERS VISITED: *Allium* sp., *Calopogonium coeruleum*, *Chromolaena odorata, Gliricidia sepium, Malachra* sp., *Phyla scaberrima, Spilanthes urens*.

***Nyctelius nyctelius nyctelius*** (Latreille 1823)
STATUS: Occasional to abundant in pastures, scrubby sites, crop fields and shaded grassy habitats. This

species is resident and may be common during the wet season but not numerous. Specimens have been reported for every month but April.
HOST PLANTS: Larvae were found on *Brachiaria mutica* and *Panicum maximum*.
FLOWERS VISITED: *Allium* sp., *Cestrum diurnum, Chromolaena odorata, Ipomoea setifera, Ipomoea tiliacea, Jatropha aethiopica, Kosteletzkya pentasperma, Malachra* sp., *Pentalinon luteum, Spilanthes urens, Tournefortia hirsutissima, Turbina corymbosa, Vigna* sp.

**PAPILIONIDAE**

***Protesilaus celadon*** (Lucas 1852)
STATUS: Uncommon in roadsides and shaded grove margins. This species only occurs as strays or dispersing adults and passing individuals in swift flight are more likely to be recorded. Specimens have been reported for April-July.
FLOWERS VISITED: *Bidens pilosa*, *Phyla scaberrima*.

***Battus devilliers*** (Godart 1822)
STATUS: Occasional in the gardens of the main grounds and open scrubby sites. This species only occurs as strays or dispersing adults. Though *Aristolochia elegans* Mast. (Aristolochiaceae) has been found in a grove tract at Santa Ana, the butterfly has not been seen using this plant. Specimens have been reported for every month but January, November and December.
FLOWERS VISITED: *Ixora* sp., *Jatropha integerrima*, *Tournefortia hirsutissima*, *Varronia globosa* ssp. *humilis*.

***Battus polydamas cubensis*** (Dufrane 1946)
STATUS: Occasional in open scrubby sites, in the gardens of the main grounds and in a grove tract at Santa Ana in association with the larval food plant. This species not only occurs as strays or dispersing adults but as a temporary colonizer when the host is available. Overuse of the few individuals of the plant or sporadic habitat destruction where it grows may determine the latter occurrence of the butterfly in the area. Specimens have been reported for every month.
HOST PLANT: Ova and larvae were found on *Aristolochia elegans*.
FLOWERS VISITED: *Cestrum diurnum*, *Cissus sicyoides* L. (Vitaceae), *Gliricidia sepium*, *Ipomoea setifera*, *Ixora* sp., *Lantana camara*, *Plumbago scandens*.

***Heraclides andraemon andraemon*** Hübner 1823
STATUS: Often abundant some years in grove clearings, open scrubby habitats, roadsides and in the gardens of the main grounds. A peak of abundance was recorded on 3 September 1998, before mid-day, when more than ten individuals were seen nectaring in a patch of *Lantana camara*, at a time when no other swallowtail species was present. The day before it rained very much indicating some local adult emergence or increased activity of existing population after heavy rains. This species is resident at Santa Ana, and specimens have been reported for every month.
HOST PLANTS: Ova and larvae were found on *Citrus aurantium* L., *Citrus limon*, *Citrus sinensis* (L.) Osbeck, and *Zanthoxylum martinicensis* (all Rutaceae).
FLOWERS VISITED: *Asclepias curassavica*, *Bidens pilosa*, *Blechum pyramidatum*, *Bouchea prismatica*, *Cestrum diurnum*, *Cissus sicyoides*, *Citrus* sp., *Ixora* sp., *Jasminum fluminense*, *Jatropha integerrima*, *Kosteletzkya pentasperma*, *Lantana camara*, *Momordica charantia*, *Phyla scaberrima*, *Spilanthes urens*, *Stachytarpheta jamaicensis*, *Tournefortia hirsutissima*, *Turbina corymbosa*, *Varronia globosa* ssp. *humilis*.

***Heraclides thoas oviedo*** (Gundlach 1886)
STATUS: Two male specimens were taken on 13 August 1996 and 22 September 1997 in a grove clearing

at Santa Ana and in the garden of the main grounds. This species occurs as strays or dispersing adults.
FLOWERS VISITED: *Bidens pilosa*, *Jatropha integerrima*.

***Heraclides aristodemus temenes*** (Godart 1819)
STATUS: Occasional in the grove tract at Santa Ana and in the gardens of the main grounds. This species occurs as strays or dispersing adults, and specimens have been reported for April-June, and September-October.
HOST PLANTS: A last instar larva was found on *Citrus aurantium* at Santa Ana.
FLOWERS VISITED: *Bidens pilosa*, *Ixora* sp., *Jatropha integerrima*.

***Heraclides androgeus epidaurus*** (Godman & Salvin 1890)
STATUS: Occasional in the grove at Santa Ana and in the gardens of the main grounds. This species only occurs as strays or dispersing adults, often laying eggs on its passing. Specimens have been reported for February, and June-August.
HOST PLANTS: Larvae were found on *Citrus limon* and *Citrus sinensis*.
FLOWERS VISITED: *Cissus sicyoides*, *Ixora* sp.

***Heraclides caiguanabus*** (Poey 1851)
STATUS: Occasional in open scrubby sites at Santa Ana and in the gardens of the main grounds. This species only occurs as strays or dispersing adults, and specimens have been reported for April-September.
FLOWERS VISITED: *Ixora* sp., *Jatropha integerrima*, *Lantana camara*, *Tournefortia hirsutissima*.

***Heraclides oxynius*** (Hübner 1827)
STATUS: Occasional in the grove tract at Santa Ana, open scrubby sites, along roadsides and in the gardens of the main grounds. Single male adults select clearings between trees as territories, flying in circles at certain height sometimes near the canopy. This species only occurs as strays or dispersing adults, however, transient breeding could take place since two *Zanthoxylum* species, a reported larval host, are present. Specimens have been reported for February, April, May, July, August, October, and November.
FLOWERS VISITED: *Bidens pilosa*, *Cissus sicyoides*, *Ixora* sp., *Lantana camara*, *Melochia pyramidata* var. *pyramidata*, *Phyla scaberrima*, *Tournefortia hirsutissima*.

**PIERIDAE**
***Appias drusilla poeyi*** Butler 1872
STATUS: Occasional in open scrubby sites and in the gardens of the main grounds. The wing coloration of females varies seasonally, being the dry season phenotype less marked, but the wet season coloration shows a variable pattern even matching other subspecies, as a specimen taken on 18 July 1997 at Santa Ana which resembles *A. drusilla neumoegeni* (Skinner) from southern Florida, as illustrated in Minno & Emmel (1993, Plate 8, fig. 38 b). This species occurs as strays or dispersing adults, especially early in the wet season. Specimens have been reported for January, March-August, and November.
FLOWERS VISITED: *Cissus sicyoides, Ixora* sp., *Jatropha integerrima, Lagascea mollis, Phyla scaberrima, Rauvolfia tetraphylla, Spilanthes urens*.

***Ascia monuste eubotea*** (Godart 1819)
STATUS: Occasional to abundant around water dams, along ditches, pastures and on the main grounds, often in association with the larval food plants. The species experiences favorable periods some years when numbers of the pierid are consistently present at the station, especially from June to August, but out of this period it can mostly be recorded by passing individuals in flight (even disregarding visits to flowers

in some cases) or by ovipositing females. The latter individuals are responsible for having recorded the immatures of the butterfly throughout the year. This species seems to be a good disperser and an opportunistic colonizer and in the areas it occurs in both conditions. Specimens have been reported for every month.
HOST PLANTS: Ova and larvae were found on *Brassica* sp., (Brassicaceae), *Carica papaya*, *Cleome gynandra* L. (Cleomaceae), *Cleome houstonii* Ait. f. (Cleomaceae), *Cleome serrata* Jacq. (Cleomaceae), *Lepidium virginicum* L. (Brassicaceae) and *Raphanus sativus* L. (Brassicaceae).
FLOWERS VISITED: *Allium* sp., *Anoda acerifolia, Asclepias curassavica, Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Chromolaena odorata, Cissus sicyoides, Emilia sonchifolia, Euphorbia heterophylla, Ixora* sp., *Jatropha integerrima, Kallstroemia maxima, Lagascea mollis, Malachra* spp., *Malvastrum coromandelianum, Melochia pyramidata* var. *pyramidata, Merremia umbellata, Mikania micrantha, Momordica charantia, Phyla scaberrima, Portulaca oleracea, Stachytarpheta jamaicensis, Tridax procumbens, Turbina corymbosa*. Males sip water from wet soil and feed on cow droppings.

***Melete salacia cubana*** (Fruhstorfer 1908)
STATUS: Occasional to abundant during the dry season but local at Santa Ana in groves, along hedges, in open scrubby sites with sparse trees but also observed in the gardens of the main grounds. This pierid is seen more frequently at the first three months of the year and a relative abundance may take place in March, probably when the butterfly has attained certain local reproduction. Very often and coming from other sites, passing individuals in rapid flight with an approximate eastward route are also observed during this time, and taking pauses on the upper side of leaves when it is windy or during overcast periods. Specimens with ragged hindwings, probably resulting from a lizard attack, or crumpled wings are occasionally found. This species occurs as a temporary colonizer and dispersing adults, and specimens have been reported for January-April, July, August, November, and December.
HOST PLANTS: Larvae were found on *Phoradendron quadrangulare* (Kunth) Krug & Urb. (Viscaceae) growing on *Guazuma ulmifolia* branches. Pupae and pupal exuviae were found both on branches or on leaves of the tree.
FLOWERS VISITED: *Bidens pilosa, Calopogonium coeruleum, Chromolaena odorata, Citrus* sp., *Clematis dioica* (male flower), *Ixora* sp., *Jatropha integerrima, Spilanthes urens, Tournefortia hirsutissima, Varronia globosa* ssp. *humilis*.

***Eurema lucina*** (Poey 1853)
STATUS: Occasional along roadsides and pastures. This pierid disperses frequently in favorable seasons and such adults may fly through the station. During May 1994 several individuals were seen flying south. Specimens have been reported for March, May-July, November, and December.
FLOWERS VISITED: *Kallstroemia maxima, Lagascea mollis, Malvastrum coromandelianum*.

***Eurema daira palmira*** (Poey 1846)
STATUS: Most abundant during the wet season in open weedy habitats, along roadsides, in groves and on the main grounds, often in association with the larval food plant. The butterfly may be also numerous in December and January but practically unrecorded during February-April. The dry season form begins to appear in November and on 11 April 2001 a fresh male already showed the wet season form. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANT: Ova and larvae were found on *Aeschynomene americana* L. (Fabaceae).
FLOWERS VISITED: *Aeschynomene americana, Allium* sp., *Anoda acerifolia, Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Caperonia palustris* (L.) St. Hil. (Euphorbiaceae)*, Chamaesyce berteriana* (Balbis) Millsp. (Euphorbiaceae)*, Chromolaena odorata, Cucumis dipsacus, Cyanthillium cinereum, Eclipta postrata* (L.) L. (Asteraceae), *Emilia sonchifolia, Ipomoea tiliacea, Kallstroemia maxima, Lagascea*

*mollis, Macroptilium lathyroides, Malvastrum coromandelianum, Melochia nodiflora, Melochia pyramidata* var. *pyramidata, Merremia umbellata, Portulaca oleracea, Rhynchosia minima var. minima, Sida* sp., *Spilanthes urens, Talinum triangulare* (Jacq.) Willd. (Portulacaceae), *Teramnus uncinatus*, *Trianthema portulacastrum, Tridax procumbens, Turbina corymbosa*. Males also sip water from wet soil occasionally.

***Eurema messalina*** (Fabricius 1787)
STATUS: Occasional in groves and shaded scrubby habitats. This species occurs as a resident, and specimens have been reported for every month but June.
FLOWERS VISITED: *Blechum pyramidatum, Calopogonium coeruleum, Ludwigia octovalvis* (Jacq.) Raven (Onagraceae)*, Momordica charantia, Phyla scaberrima, Portulaca oleracea, Varronia globosa* ssp. *humilis*.

***Eurema nicippe*** (Cramer 1782)
STATUS: Occasional to abundant in pastures, scrubby habitats, crop fields, along roadsides and on the main grounds. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Ova and larvae were found on *Senna alata* (L.) Roxb., *Senna obtusifolia* (L.) Irwing & Barneby, *Senna occidentalis* (L.) Link, and *Senna uniflora* (Mill.) Irwing & Barneby (Fabaceae).
FLOWERS VISITED: *Allium* sp., *Anoda acerifolia, Bidens pilosa, Blechum pyramidatum, Bouchea prismatica, Calopogonium coeruleum, Catharanthus roseus*, *Corchorus siliquosus*, *Cucumis dipsacus, Dicliptera vahliana* Nees (Acanthaceae)*, Emilia sonchifolia, Ipomoea tiliacea, Jatropha integerrima, Kallstroemia maxima, Lantana camara, Macroptilium atropurpureum, Macroptilium lathyroides, Malachra* sp., *Melochia pyramidata* var. *pyramidata, Merremia umbellata, Momordica charantia, Stachytarpheta jamaicensis, Tournefortia hirsutissima, Turbina corymbosa, Vigna vexillata*. Males also sip water from wet soil.

***Eurema boisduvaliana*** (C. & R. Felder 1865)
STATUS: A worn female specimen was taken at the station on 11 June 2001 attracted by the trees of *Senna spectabilis* (DC.) Irwing & Barneby (Fabaceae) naturalized on the main grounds and another female was taken at Santa Ana on 3 July that year. This species only occurs as strays or dispersing adults.
FLOWER VISITED: *Tournefortia hirsutissima*.

***Eurema amelia*** (Poey 1851 )
STATUS: A fresh male specimen was taken while perching on low herbs and making short flights within a cassava plantation on 2 August 2000. This species only occurs as dispersing adults. *E. amelia* and *E. lucina* are inhabitants of dry savannas, where they can be found flying together, but the former is less probable to be seen out of its preferred habitat.

***Eurema proterpia proterpia*** (Fabricius 1775)
STATUS: Uncommon in open fields and scrubby sites. This pierid only occurs as strays or dispersing adults. Specimens have been reported for June, August, and December.
FLOWERS VISITED: *Macroptilium lathyroides*.

***Eurema lisa euterpe*** (Ménétriés 1832)
STATUS: Abundant in open fields, roadsides and near patches of the food plants. This species occurs as a resident and peaks have been observed during March, May, July and December. Specimens have been reported for every month.
HOST PLANTS: Observed ovipositing on *Desmanthus virgatus* (L.) Willd. (Fabaceae). Larvae were found on *Mimosa pudica* L. (Fabaceae) and *Neptunia plena* (L.) Benth. (Fabaceae).
FLOWERS VISITED: *Aeschynomene americana, Alternanthera pungens, Ammannia coccinea* Rottb. (Lythraceae), *Anoda acerifolia, Bidens pilosa, Blechum pyramidatum, Boerhavia erecta, Calopogonium*

*coeruleum, Caperonia palustris, Chamaesyce berteriana, Chromolaena odorata, Cyanthillium cinereum, Emilia sonchifolia, Ipomoea tiliacea, Kallstroemia maxima, Kosteletzkya pentasperma, Lagascea mollis, Lantana camara, Ludwigia* sp., *Macroptilium atropurpureum, Malachra* sp., *Malvastrum coromandelianum, Melochia nodiflora, Melochia pyramidata* var. *pyramidata, Mikania micrantha, Momordica charantia, Phyla scaberrima, Portulaca oleracea, Pseudelephantopus spicatus* (Juss. ex Aubl.) C. F. Baker (Asteraceae)*, Sida acuta, Sida* sp., *Spilanthes urens, Teramnus uncinatus, Tridax procumbens, Varronia globosa* ssp. *humilis*. Males also sip water from wet soil and may singly or in small groups feed on cow droppings.
PREDATOR: A *Neoscona* sp. (Araneae: Araneidae) was found feeding on a male adult on *Dichanthium* sp.

***Eurema dina dina*** (Poey 1832)
STATUS: Occasional during the wet season in shaded scrubby habitats, groves and in the gardens of the main grounds. This species only occurs as strays or dispersing adults. Specimens have been reported for May-October.
FLOWERS VISITED: *Bidens pilosa*, *Jatropha integerrima*, *Phyla scaberrima*, *Spilanthes urens*, *Tournefortia hirsutissima*.

***Eurema nise nise*** (Cramer 1775)
STATUS: Occasional to abundant in groves and shaded scrubby habitats. This species occurs as a resident, and specimens have been reported for every month.
HOST PLANTS: Observed ovipositing on *Mimosa pudica*.
FLOWERS VISITED: *Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Chromolaena odorata, Eclipta postrata, Melochia pyramidata* var. *pyramidata, Melothria guadalupensis* (Spreng.) Cogn. (Cucurbitaceae)*, Sida* sp., *Spilanthes urens*.

***Nathalis iole*** Boisduval 1836
STATUS: This species was present in certain number from April to July 1995 but the following year was only seen by a single sight record. In subsequent years the butterfly was not found again until June and July 2001 when it was common along roadsides of the station and scrubby sites at Santa Ana. This pierid colonizes the areas in favorable years. The reasons of an unsuccessful establishment are not known though *Bidens pilosa*, a reported larval host, is most abundant.
FLOWERS VISITED: *Bidens pilosa*, *Phyla scaberrima*.

***Kricogonia lyside*** (Godart 1819)
STATUS: One male specimen was taken on 23 March 1994 and other was observed on 19 June 1995 in open scrubs at the station. This species only occurs as strays or dispersing adults.
FLOWERS VISITED: *Bidens pilosa*, *Spilanthes urens*.

***Kricogonia cabrerai*** Ramsden 1920
STATUS: One male specimen was taken on 14 July 1997 on the main grounds. This species only occurs as strays. The record of this pierid in Camagüey may reflect a wider distribution of the species in Cuba though it is only known from its restricted eastern coastal range mainly around Guantánamo province (Smith *et al*. 1994).
FLOWER VISITED: *Sida* sp.

***Zerene cesonia*** (Stoll 1790)
STATUS: I observed two adults on 28 June 1994 and 17 January 1995 in weedy open sites around crop fields at the station. This species only occurs as strays.
FLOWER VISITED: *Malachra* sp.

***Anteos clorinde nivifera*** (Fruhstorfer 1907)
STATUS: Occasional to abundant in the gardens of the main grounds, pastures and open scrubby sites. During overcast periods, the adults select broad-leaved trees as *Clusia rosea* Jacq. (Clusiaceae), and *Coccoloba uvifera* (L.) L. (Polygonaceae) to perch on the underside of leaves. This pierid may attain peaks of abundance in July probably due to an increased seasonal influx of individuals from nearby breeding sites but at the station, this species only occurs as strays or dispersing adults. The lack of suitable larval food plants seems to be a major limiting factor since *A. clorinde* does not utilize other *Cassia* or *Senna* species which grow naturally in the area. Specimens have been reported for every month.
HOST PLANT: Larvae were found on *Senna spectabilis* naturalized on the main grounds.
FLOWERS VISITED: *Allamanda cathartica*, *Allium* sp., *Canna* sp., *Catharanthus roseus, Ipomoea batatas, Ixora* sp., *Macroptilium lathyroides*, *Malachra* sp., *Pentalinon luteum*, *Phyla scaberrima, Ruellia nudiflora, Stachytarpheta jamaicensis, Varronia globosa* ssp. *humilis, Vigna vexillata*. Males sip water from wet soil on occasions.

***Phoebis avellaneda*** (Herrich-Schäffer 1864)
STATUS: Occasional in the gardens of the main grounds and scrubby sites at Santa Ana. This species only occurs as strays or dispersing adults, mainly in the wet season. Specimens have been reported for February, June-August, and November.
HOST PLANT: Observed ovipositing on *Cassia grandis* L. (Fabaceae).
FLOWER VISITED: *Ixora* sp.

***Phoebis philea huebneri*** (Fruhstorfer 1907)
STATUS: Occasional in the gardens of the main grounds and scrubby sites at Santa Ana. This pierid occurs as strays or dispersing adults, often laying eggs on its passing. Specimens have been reported for February, May-August, November, and December.
HOST PLANTS: Larvae were found on *Cassia grandis* and *Senna spectabilis*.
FLOWERS VISITED: *Ixora* sp., *Thunbergia alata* Boj. ex Sims (Acanthaceae). A male was observed sipping water from wet soil on one occasion.

***Phoebis agarithe antillia*** F. M. Brown 1929
STATUS: Occasional to abundant in the gardens of the main grounds and scrubby sites. Consistent abundance of individuals may occur in June or July, in favorable years. This species occurs as strays and dispersing adults, and specimens have been reported for April-October.
FLOWERS VISITED: *Allium* sp., *Bidens pilosa*, *Koanophyllum* sp. (Asteraceae), *Ixora* sp., *Macroptilium lathyroides*, *Tournefortia hirsutissima*, *Varronia globosa* ssp. *humilis*.

***Phoebis sennae sennae*** (Linnaeus 1758)
STATUS: Abundant in open scrubby sites, crop fields, along roadsides and in the gardens of the main grounds. This pierid may become numerous during most of the wet season (July-September), but also recorded in abundance in early November and December. This species occurs as a resident; however, it seems to be a good disperser and opportunistic colonizer. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Cassia grandis, Senna alata* and *Senna occidentalis*.
FLOWERS VISITED: *Allamanda cathartica, Allium* sp., *Asclepias curassavica, Bidens pilosa, Blechum pyramidatum, Canna* sp., *Catharanthus roseus, Citrus* sp., *Dicliptera vahliana, Emilia sonchifolia, Gliricidia sepium, Abelmoschus esculentum* (L.) Moench., (Malvaceae), *Ipomoea batatas, Ipomoea setifera, Ipomoea tiliacea, Ixora* sp., *Jatropha gossypifolia* L. (Euphorbiaceae), *Jatropha integerrima, Kosteletzkya pentasperma, Lonchocarpus domingensis*, *Macroptilium atropurpureum, Macroptilium lathyroides, Malachra* sp., *Merremia umbellata, Momordica charantia, Pentalinon luteum, Phyla scaberrima, Ruellia*

*nudiflora, Sonchus oleraceus* L. (Asteraceae)*, Spilanthes urens, Stachytarpheta jamaicensis, Thunbergia alata, Tournefortia hirsutissima, Turbina corymbosa, Varronia globosa* ssp. *humilis*. Males also sip water from wet soil occasionally, and feed on cow droppings.
PREDATOR: A *Parastephanops echinatus* was feeding on a male adult on *Brachiaria mutica*.

***Aphrissa orbis orbis*** (Poey 1832)
STATUS: Occasional in the gardens of the main grounds and scrubby sites. This species only occurs as strays or dispersing adults, notably during the wet season. Specimens have been reported for May-August, and November, and female individuals have been the only seen.
FLOWER VISITED: *Ixora* sp.

***Aphrissa neleis*** (Boisduval 1836)
STATUS: Occasional in the gardens of the main grounds and grove edges at Santa Ana. This species only occurs as strays or dispersing adults. Specimens have been reported for June-August.
FLOWERS VISITED: *Ixora* sp., *Tournefortia hirsutissima*.

***Aphrissa statira cubana*** d'Almeida 1939
STATUS: Occasional to abundant in the gardens of the main grounds and grove edges at Santa Ana. This species only occurs as strays or dispersing adults (often breeding in small numbers), and this is the *Aphrissa* more frequently seen in the areas. Specimens have been reported for February, April, and July-October.
HOST PLANT: Larvae were found on *Cassia grandis*.
FLOWERS VISITED: *Ixora* sp., *Lantana camara*, *Tournefortia hirsutissima*, *Varronia globosa* ssp. *humilis*.

LYCAENIDAE
***Allosmaitia coelebs coelebs*** (Herrich-Schäffer 1862)
STATUS: Occasional at Santa Ana along hedges and in open scrubby sites with sparse trees, near the larval food plant. A few sporadic adults were seen though immatures have been abundant, sometimes it is the only evidence of the occurrence of the species in the area. This hairstreak only occurs as a regular but temporary colonizer, mostly in the dry season (December-April). Specimens have been reported for January-June, September, and December.
HOST PLANTS: Ova and larvae were found on *Stigmaphyllon sagraeanum* flowers.
FLOWERS VISITED: *Gouania polygama* (Jacq.) Urban (Rhamnaceae), *Varronia globosa ssp. humilis*.

***Chlorostrymon maesites maesites*** (Herrich-Schäffer 1864)
STATUS: Occasional during the bloom period of the larval food plant (November-March) in open shrubby sites, along roadsides, in grove and hedge margins and scrubby habitats. This hairstreak is infrequently seen in the field even knowing of its occurrence. Nectaring or thermoregulating activities have been recorded both at low or medium height but it may readily fly high to perch on the upper margin of tree leaves. This species only temporarily colonizes the area every year, when the larval food source is available. Out of this period is unknown if the species uses an additional host. Specimens have been reported for January-March, May, July-September, November, and December
HOST PLANTS: Larvae were found on *Calopogonium coeruleum* flowers.
FLOWERS VISITED: *Calopogonium coeruleum*, *Varronia globosa* ssp. *humilis*.

***Ministrymon azia*** (Hewitson 1873)
STATUS: Occasional to abundant near the larval food plant patches in pastures, open scrubby sites, grove edges and shaded tree understories. This lycaenid may become numerous by late October and this condition

continues until February. This species occurs as a temporary colonizer, and specimens have been reported for every month but April. This hairstreak was newly recorded from Cuba in September 1991 in Pinar del Río province and subsequently reported in several other island localities (Smith & Hernández 1992), including Camagüey (Fernández y Rodríguez 1997) and it seems that *M. azia* was an overlooked island resident long before it was first observed.
HOST PLANTS: Larvae were found on *Acacia farnesiana* (L.) Willd. (Fabaceae) and *Leucaena leucocephala* (Lam.) De Wit (Fabaceae) flowers. Observed ovipositing on *Mimosa pudica* flowers.
FLOWERS VISITED: *Alternanthera pungens, Bidens pilosa, Calopogonium coeruleum, Chromolaena odorata, Gerascanthus laevigatus, Spilanthes urens, Tournefortia hirsutissima*.

***Strymon martialis*** (Herrich-Schäffer 1864)
STATUS: Occasional to abundant in low sunlit vegetation near grove and hedge margins, in shaded tree understories and open scrubby sites. Observed once in a cassava field. Adults may readily fly high to perch on the upper side of bush or tree leaves. Records indicate that the species has been more numerous in May and during October-November, however, this lycaenid may be easily overlooked and has never achieved the abundance of the next two *Strymon* and individuals are rather localized. This species occurs as a resident, and specimens have been reported for every month but April.
HOST PLANT: Observed twice in ovipositing behavior on *Varronia globosa* ssp. *humilis* flowers.
FLOWERS VISITED: *Bidens pilosa*, *Calopogonium coeruleum*, *Gouania polygama*, *Spilanthes urens*, *Varronia globosa* ssp. *humilis*.

***Strymon columella cybira*** (Hewitson 1874)
STATUS: Abundant and associated to the weedy vegetation around crop fields, along roadsides, in pastures and on the main grounds. This species occurs as a resident and is well adapted to regular destruction of its habitat and recolonization of new areas. Specimens have been reported for every month.
HOST PLANTS: One larva was found on *Waltheria indica* L. (Sterculiaceae) flowers. Ova and larvae were found on *Blechum pyramidatum, Portulaca oleracea, Malvastrum americanum*, and *Malvastrum coromandelianum* flowers. One larva was found on *Melochia pyramidata* var. *pyramidata* flowers.
FLOWERS VISITED: *Allium* sp., *Bidens pilosa, Calopogonium coeruleum, Chamaesyce berteriana, Citharexylum fruticosum, Euphorbia heterophylla*, *Macroptilium atropurpureum, Malvastrum americanum, Melochia pyramidata* var. *pyramidata, Phyla scaberrima, Portulaca oleracea, Sida* sp., *Spilanthes urens, Varronia globosa* ssp. *humilis*.

***Strymon limenia*** (Hewitson 1868)
STATUS: Abundant in pastures, along roadsides, at the weedy vegetation around crop fields, in patches of the larval food plants, in shady tree understories and grove edges. This lycaenid may be numerous during early October but adult abundance may continue throughout this month until December. This species occurs as a resident and, as *S. columella*, it is well adapted to habitat losses and recolonization of new weedy areas. Specimens have been reported for every month.
HOST PLANTS: Ova and larvae were found on *Malachra alceifolia*, *Malachra urens* Poit. (Malvaceae), *Malvastrum corchorifolium* (Desr.) Britt. (Malvaceae), and *Malvastrum coromandelianum* flowers and fruits.
FLOWERS VISITED: *Alternanthera pungens, Anoda acerifolia, Bidens pilosa, Calopogonium coeruleum, Chamaesyce berteriana, Chromolaena odorata, Cyanthillium cinereum, Ipomoea tiliacea, Lagascea mollis, Malachra* spp., *Melochia pyramidata* var. *pyramidata, Mikania micrantha, Murraya paniculata*, *Phyla scaberrima, Serjania diversifolia* (Jacq.) Radlk. (Sapindaceae)*, Sida* sp., *Spilanthes urens, Varronia globosa* ssp. *humilis*.

***Electrostrymon angelia angelia*** (Hewitson 1874)
STATUS: Occasional to abundant in shaded shrubby sites and grove and hedge margins. This species occurs as a resident and can be more abundant during the dry season. Specimens have been reported for every month.
HOST PLANTS: One egg was found on *Salvia misella* Kunth. (Lamiaceae) flowers (some hatched egg shells, most probably of this lycaenid, were previously seen). The larva from this egg was also fed with the flowers of *Salvia micrantha*.
FLOWERS VISITED: *Bidens pilosa, Calopogonium coeruleum, Casearia aculeata, Chromolaena odorata, Clematis dioica* (male flower)*, Gerascanthus laevigatus, Gliricidia sepium, Gouania polygama, Phyla scaberrima, Spilanthes urens, Varronia globosa* ssp. *humilis*.

***Leptotes cassius theonus*** (Lucas 1857)
STATUS: Abundant in pastures, along roadsides and hedges, in shady groves, scrubby sites, crop fields and on the main grounds. This species occurs as a resident. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Acacia farnesiana, Crotalaria incana* L. (Fabaceae), *Dichrostachys cinerea*, *Gliricidia sepium, Indigofera suffruticosa*, *Macroptilium lathyroides, Phaseolus* sp., *Plumbago scandens, Rhynchosia minima* var. *minima*, *Samanea saman* and *Sesbania cannabina* flowers.
FLOWERS VISITED: *Aeschynomene americana*, *Allium* sp., *Alternanthera pungens, Bidens pilosa, Caesalpinia pauciflora* (Griseb.) C. Wright (Fabaceae), *Calopogonium coeruleum, Caperonia palustris*, *Chamasyce berteriana, Chromolaena odorata, Coniza canadensis* (L.) Cronq. (Asteraceae), *Cyanthillium cinereum, Desmodium incanum* var. *incanum*, *Jatropha integerrima, Kallstroemia maxima, Macroptilium atropurpureum, Macroptilium lathyroides, Melochia pyramidata* var. *pyramidata, Melothria guadalupensis, Mikania micrantha, Phaseolus* sp., *Phyla scaberrima, Rauvolfia tetraphylla, Rhynchosia minima* var. *minima, Salvia micrantha, Sida* sp., *Spilanthes urens, Tournefortia hirsutissima, Trianthema portulacastrum*. Solitary males (or even females) also sip water from wet soil in hot hours occasionally.
PREDATOR: A *Misumenops bellulus* (Banks) (Araneae: Thomisidae) was feeding on a male adult on *Serjania diversifolia*.

***Hemiargus hanno filenus*** (Poey 1832)
STATUS: Abundant in open scrubby sites, pastures, along roadsides and in the weedy vegetation around crop fields, often in association with clumps of the larval host plants. This species occurs as a resident and it has seen in abundance in late February and early March. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Macroptilium atropurpureum, Macroptilium lathyroides, Mimosa pudica, Neptunia plena*, *Rhynchosia minima* var. *minima* flowers. Observed ovipositing on *Desmanthus virgatus* flowers.
FLOWERS VISITED: *Alternanthera pungens, Bidens pilosa, Boerhavia erecta, Calopogonium coeruleum, Chamaesyce berteriana, Clematis dioica* (male flower), *Emilia sonchifolia, Chromolaena odorata, Cyanthillium cinereum, Euphorbia heterophylla, Gliricidia sepium, Lagascea mollis, Ludwigia octovalvis*, *Macroptilium lathyroides, Malachra* spp., *Melochia nodiflora, Melochia pyramidata* var. *pyramidata, Mikania micrantha, Momordica charantia, Parthenium hysterophorus* L. (Asteraceae), *Phyla scaberrima, Portulaca oleracea, Pseudelephantopus spicatus, Rhynchosia minima* var. *minima*, *Serjania diversifolia, Sida* sp., *Spilanthes urens, Trianthema portulacastrum, Varronia globosa* ssp. *humilis*. Males also sip water from wet soil in hot hours and feed on cow droppings. Several adults were once seen drinking dew from grasses early in the morning.
PARASITOID: An unidentified dipteran (Tachynidae ?) reared from larvae in March 1996. Larvae when parasited became pale yellow and did not pupate. The dipteran larva abandoned the host and reached the adult stage in 7-11 days (n=4) days.

***Cyclargus ammon ammon*** (Lucas 1857)
STATUS: Occasional to abundant in pastures and scrubby habitats but often local near larval host plant patches. This species occurs as a resident but it has never achieved the abundance of *H. hanno* and *L. cassius* populations. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Acacia farnesiana, Caesalpinia pauciflora, Cardiospermum microcarpum* Kunth (Sapindaceae) and *Stigmaphyllon sagraeanum* flowers.
FLOWERS VISITED: *Spilanthes urens, Varronia globosa* ssp. *humilis*.

**LIBYTHEIDAE**
***Libytheana motya*** (Boisduval & Leconte 1833)
STATUS: Uncommon along shady grove, hedge margins and pastures. This species only occurs as strays or dispersing adults. Specimens have been reported for June and July.
FLOWERS VISITED: *Phyla scaberrima*.

**NYMPHALIDAE**
***Danaus plexippus plexippus*** (Linnaeus 1758)
STATUS: Occasional to abundant in pastures, scrubby sites and on the main buildings (main grounds) of the station. A behavior of the adults shared with the next two other *Danaus* species, consisting of perching on low plants beneath the shade of trees at mid-day has been observed. The butterfly may attain some number during the wet season (July-August) and in December and January, in favorable years, but it has never achieved the abundance of the other two *Danaus* species. This species not only frequently strays into the station but it also occurs as a temporary colonizer. Specimens have been reported for every month.
HOST PLANTS: Ova and larvae were found on *Asclepias curassavica* and *Calotropis procera* (Ait.) R. Br. (Asclepiadaceae) naturalized on the main grounds. The former is the native, though scarce, preferred larval host plant.
FLOWERS VISITED: *Allium* sp., *Asclepias curassavica*, *Bidens pilosa*, *Calopogonium coeruleum*, *Canna* sp., *Cestrum diurnum*, *Chromolaena odorata*, *Clematis dioica* (male flower), *Dicliptera vahliana*, *Emilia sonchifolia*, *Gliricidia sepium*, *Jatropha aethiopica*, *Kosteletzkya pentasperma*, *Lagascea mollis*, *Phyla scaberrima*, *Spilanthes urens*.

***Danaus eresimus tethys*** Forbes 1943
STATUS: Occasional to abundant in pastures, scrubby sites and on the main grounds. As in the next species, the adults also perch on grass panicles or the tip of dry plants at full sun. Numbers of individuals have been recorded in July or August in a particular year, outnumbering the next species on occasion. This species not only frequently strays into the station but it also occurs as a temporary colonizer. Specimens have been reported for every month but April.
HOST PLANTS: Ova and larvae were found on *Sarcostemma clausum* (Jacq.) Roem. & Schult. (Asclepiadaceae).
FLOWERS VISITED: *Allium* sp., *Calopogonium coeruleum*, *Chromolaena odorata*, *Phyla scaberrima*, *Spilanthes urens*, *Varronia globosa* ssp. *humilis*.

***Danaus gilippus berenice*** (Cramer 1779)
STATUS: Occasional to abundant in pastures, scrubby sites and on the main grounds. Considerable numbers of this butterfly may be found in July and August. A first population increase may occur after the rains in early July, both by the arrival of an influx of colonizer individuals and some local adult eclosions. The second increase is when the butterfly has attained a successful reproduction in the area in subsequent months (this fact is also valid for *D. eresimus*). The larval host plant use of *D. gilippus* was recorded during

1998 and immatures were found each month at the station. A small garden of *Asclepias curassavica* and *Calotropis procera* was planted on the main grounds and the insects readily used the first plant, but later were common on the latter as well. The lowest numbers of larvae occurred in October and December and the greatest were recorded during August and late September. By the year 2000, only *C. procera* had remained in the garden but larvae were not found with the abundance previously seen but they occurred in sporadic and single larvae. It seems likely that this plant is an alternative rather than a commonly used larval host for *D. gilippus* and *D. plexippus*. In general, the availability of the hostplants is a main limiting factor that affects the permanent establishment of the three *Danaus* species. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Asclepias curassavica*, *Asclepias nivea* L. (Asclepiadaceae), *Calotropis procera* and *Sarcostemma clausum*.
FLOWERS VISITED: *Allium* sp. *Asclepias curassavica*, *Bidens pilosa*, *Calopogonium coeruleum*, *Chromolaena odorata*, *Jatropha aethiopica*, *Jatropha integerrima*, *Kosteletzkya pentasperma*, *Lagascea mollis*, *Malachra* spp., *Melochia pyramidata* var. *pyramidata*, *Mikania micrantha*, *Phyla scaberrima*, *Sida* sp., *Sonchus oleraceus*, *Spilanthes urens*.
PREDATOR: An undetermined ant species was found attacking and feeding on pupae on *A. curassavica*.
PARASITOID: A dipteran (Tachynidae?) reared from larvae on *A. curassavica* during August and early September 1998. The dipteran larvae leave the host when it prepares for pupation. Two or three larvae are present in the body of the caterpillar.

***Dryas iulia nudeola*** (D. M. Bates 1935)
STATUS: Often abundant in shady groves, along hedge margins, in pastures, scrubby sites and in the gardens of the main grounds. This species occurs as a resident at Santa Ana and it has been found abundantly during November-December. Specimens have been reported for every month.
HOSTPLANT: Larvae were found on *Passiflora capsularis* L. (Passifloraceae) and *Passiflora suberosa* L. (Passifloraceae).
FLOWERS VISITED: *Alternanthera pungens*, *Asclepias curassavica*, *Bidens pilosa*, *Calopogonium coeruleum*, *Casearia aculeata*, *Chromolaena odorata*, *Cissus sicyoides*, *Citrus* sp., *Clematis dioica* (male flower), *Cucumis sativus*, *Gerascanthus laevigatus*, *Ixora* sp., *Jatropha aethiopica*, *Jatropha integerrima*, *Lagascea mollis*, *Lantana camara*, *Malachra* spp., *Manguifera indica*, *Mikania micrantha*, *Persea americana*, *Pisonia aculeata*, *Plumbago scandens*, *Rauvolfia tetraphylla*, *Serjania diversifolia*, *Spilanthes urens*, *Tournefortia hirsutissima*, *Varronia globosa* ssp. *humilis*. Four adult butterflies were feeding on the rather dried red pulp covering the seeds of an open ripe fruit of *Momordica charantia*, in a shaded site of a grove at Santa Ana. Male adults also sip water from wet soil on occasions.

***Agraulis vanillae insularis*** Maynard 1889
STATUS: Abundant in pastures, along hedges and roadsides, in crop fields, scrubby sites, shaded groves in association with the larval food plants, and in the gardens of the main grounds. The butterfly may be numerous on occasions and a peak of abundance was recorded in August 1998 but it is variable in abundance in other months in any particular year. This species occurs as a resident and temporal loss of its habitat does not threaten extant populations. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Passiflora capsularis*, *Passiflora edulis* Sims. (Passifloraceae) (once commonly cultivated on the main grounds of the station), and *Passiflora suberosa*.
FLOWERS VISITED: *Allium* sp., *Anoda acerifolia*, *Asclepias curassavica, Bidens pilosa, Blechum pyramidatum, Bouchea prismatica*, *Calopogonium coeruleum, Cestrum diurnum, Chromolaena odorata, Citharexylum fruticosum*, *Citrus* sp., *Clematis dioica* (male flower), *Cucumis dipsacus*, *Cyanthillium cinereum*, *Dicliptera vahliana, Gliricidia sepium, Ipomoea ochroleuca* Spanoghe (Convolvulaceae), *Ipomoea setifera*, *Ipomoea tiliacea, Ixora* sp., *Jasminum fluminense*, *Jatropha aethiopica, Jatropha integerrima,*

*Kallstroemia maxima, Kosteletzkya pentasperma, Lagascea mollis, Lantana camara, Macroptilium atropurpureum*, *Macroptilium lathyroides*, *Malachra* spp., *Malvastrum coromandelianum*, *Melochia pyramidata* var. *pyramidata, Merremia umbellata*, *Mikania micrantha, Phyla scaberrima, Portulaca oleracea, Salvia micrantha, Sida acuta*, *Sida* sp., *Spilanthes urens, Stachytarpheta jamaicensis, Tagetes erecta, Tournefortia hirsutissima, Turbina corymbosa, Varronia globosa* ssp. *humilis*. Males (and females occasionally) sip water from moist soil.
PREDATOR: An unidentified hemipteran (Phymatidae) caught a female adult on *Tournefortia*.

***Heliconius charitonia ramsdeni*** Comstock & Brown 1950
STATUS: Abundant in open scrubby sites, groves, shady habitats, along hedges and in the gardens of the main grounds. The adults have been observed in abundance in January, July, August, November and December. Individuals with the phenotype of subspecies *Heliconius charitonia punctatus* Hall also occur among the usual morph. Percentages of occurrence of this variant were not estimated but it may be found in either sexes and in both seasons. The spot shows different degrees of variability in size and shape. This species occurs as a resident and as in *Agraulis* it recovers population numbers after temporal habitat loss, probably due to the availability of the larval food plant. Specimens have been reported for every month.
HOST PLANT: Ova and larvae were found on *Passiflora suberosa* and it seems to be the preferred larval host in the areas.
FLOWERS VISITED: *Allium* sp., *Alternanthera pungens, Asclepias curassavica, Bidens pilosa, Blechum pyramidatum, Calopogonium coeruleum, Chromolaena odorata, Cissus sicyoides, Dicliptera vahliana, Ixora* sp., *Jasminum fluminense, Jatropha aethiopica, Jatropha integerrima, Kosteletzkya pentasperma, Lantana camara, Malachra* spp., *Melochia nodiflora, Melothria guadalupensis*, *Momordica charantia, Phyla scaberrima, Rauvolfia tetraphylla, Sida* sp., *Spilanthes urens, Tournefortia hirsutissima, Varronia globosa* ssp. *humilis*. Adults have been seen with the proboscis caked with pollen.

***Siderone galanthis nemesis*** (Illiger 1802)
STATUS: Occasional in groves, banana plantations and open scrubby sites. Though adults were seen infrequently, larvae have been abundant on occasions. This species mostly occurs as strays, attracted to various ripe fruits, but it does breed in some number. Specimens have been reported for every month but May-June.
HOST PLANTS: Ova and larvae were found on *Casearia aculeata* and *C. hirsuta* Sw. (Flacourtiaceae).

***Anaea cubana*** (H. H. Druce 1905)
STATUS: Occasional in banana plantations, groves and along shady hedge margins. Adults have been seen taking pauses in suitable sites or attracted to overripe bananas but passing individuals in flight are mostly seen. This species occurs as strays or dispersing adults, and specimens have been reported for January, February, July-September, and November.

***Memphis echemus echemus*** (Doubleday 1850)
STATUS: I observed one ragged adult on 21 October 1998 at Santa Ana. This species only occurs as strays.

***Marpesia eleuchea eleuchea*** (Hübner 1818)
STATUS: Occasional to abundant along roadsides and hedges, in grove margins and scrubby sites. This species breeds in small numbers during favorable periods in both seasons but it only occurs as a temporary colonizer. Specimens have been reported for every month.
HOST PLANTS: Larvae and one pupa were found on *Ficus membranacea* C. Wright (Moraceae).
FLOWERS VISITED: *Gouania polygama*, *Jatropha aethiopica*, *Lantana camara*, *Mikania micrantha*, *Phyla scaberrima*, *Serjania diversifolia*, *Spilanthes urens*, *Tournefortia hirsutissima*, *Varronia globosa* ssp. *humilis*.

***Marpesia chiron*** (Fabricius 1775)
STATUS: This species rarely strays into the areas, and specimens have been reported for September-November.

***Historis acheronta semele*** (D. M. Bates 1939)
STATUS: Uncommon in banana plantations. On 11 August 2000 four separated individuals were seen flying north. This species only occurs as strays or dispersing adults, and specimens have been reported for May, July, and August.

***Historis odius odius*** (Fabricius 1775)
STATUS: Occasional in banana plantations, groves and on the main grounds. The adults have been seen attracted to the fallen fruits of *Cordia obliqua* Willd. (Boraginaceae) and one specimen was found alive in a deposit of molasses, glued open winged on the surface of the content. This species occurs as strays, and specimens have been reported for January-April, July-September, November, and December.

***Hamadryas amphichloe diasia*** (Fruhstorfer 1916)
STATUS: Occasional in groves, banana plantations and on the main grounds. Though passing individuals are more frequently seen, the butterfly may be present with relative abundance in July and August. This species occurs as strays or dispersing adults often gathering in the area when a seasonal source of ripe fruits, such as those of *Cordia obliqua*, is available. Specimens have been reported for every month.

***Lucinia sida sida*** Hübner 1823
STATUS: Occasional to abundant along hedges, in scrubby sites and groves at Santa Ana. This species appears to be resident and though sporadic habitat loss may threaten extant population, the butterfly reestablishes when conditions return to normal. Specimens have been reported for every month.
HOST PLANTS: Observed twice ovipositing on *Serjania diversifolia*.
FLOWERS VISITED: *Lantana camara*. Adults feed on the ripe fruits of *Cordia obliqua* and *Tournefortia hirsutissima* remaining on the plants.

***Eunica tatila tatilista*** Kaye 1926
STATUS: One specimen was taken on 15 July 1997 in a grove margin at the station and previous to this, a few individuals were seen. A major outbreak of the butterfly took place at this time in Santa Lucia beach in the north coast of Camagüey province, where the species is known to occur since 1994. Additional specimens were also found during this period in the city of Camagüey, Vilató (attracted to ripe mangoes) and Albaiza (attracted to sugar cane bagasse along a trash). This species only occurred as strays or dispersing adults at the station.

***Adelpha iphicla iphimedia*** Fruhstorfer 1915
STATUS: Occasional in grove margins. In August 2000 a fresh individual was observed flying at low height in a pasture and briefly pausing on the panicle of a *Paspalum* sp. (Poaceae) with wings fully open. This species only occurs as strays, and specimens have been reported for January, February, and August-October.
FLOWERS VISITED: *Bidens pilosa*, *Malachra* sp.

***Junonia coenia coenia*** Hübner 1822
STATUS: Occasional to abundant in pastures and along roadsides. Males patrol roads and perch on bare ground. This species appears to breed in small numbers, though the specific larval host plants are

not known, but it occurs as a temporary colonizer. In favorable years the adults may be more abundant during July-October with peaks of abundance in August. Specimens have been reported for every month but May.
FLOWERS VISITED: *Bidens pilosa*, *Calopogonium coeruleum*, *Chromolaena odorata*, *Malachra* sp., *Melochia pyramidata* var. *pyramidata*, *Spilanthes urens*.

***Junonia genoveva*** (Cramer 1782)
STATUS: Occasional to abundant in pastures, scrubby sites, along roadsides and on the main grounds. This species probably occurs as a resident but it remains almost unrecorded during those months of low species richness and impoverishment of habitats particularly in extreme drought periods, though peaks of abundance may occur as that observed during August 1998. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Stachytarpheta jamaicensis* and *Ruellia nudiflora*. Observed ovipositing on *Phyla scaberrima* but neonate larva rejected the leaves of the plant, only accepting *S. jamaicensis*.
FLOWERS VISITED: *Bidens pilosa*, *Chromolaena odorata*, *Lagascea mollis*, *Malachra* sp., *Mikania micrantha*, *Phyla scaberrima*, *Portulaca oleracea*, *Spilanthes urens*, *Tagetes erecta*, *Tournefortia hirsutissima*, *Trianthema portulacastrum*. An adult was once observed sipping moisture from wet soil.

***Junonia evarete*** (Stoll 1782)
STATUS: Occasional in pastures and scrubby sites. This species occurs as strays or dispersing adults, and it is a new province record. Specimens have been reported for January, April, May, July-September, and December.
FLOWERS VISITED: *Chromolaena odorata*, *Spilanthes urens*.

***Anartia jatrophae guantanamo*** Munroe 1942
STATUS: Abundant along roadsides and hedge margins, in pastures, groves and on the main grounds. This is a resident species and though it usually can be found in numbers all the year, the butterfly has experienced population explosions mainly from May to October. Specimens have been reported for every month.
HOST PLANTS: Larvae were found on *Bacopa monnieri* (L.) Pennell (Scrophulariaceae), *Blechum pyramidatum, Phyla scaberrima* and *Ruellia nudiflora*. On 3 July 1996 more than 240 larvae were recorded in an area of only 15 $m^2$ , feeding on *Bacopa monnieri*, on the main grounds of the station.
FLOWERS VISITED: *Allium* sp., *Alternanthera pungens, Asclepias curassavica, Bidens pilosa, Calopogonium coeruleum, Clematis dioica* (male flower), *Chromolaena odorata*, *Cucumis sativus*, *Cyanthillium cinereum, Emilia sonchifolia, Gouania polygama, Ipomoea batatas, Ipomoea tiliacea*, *Ixora* sp., *Jatropha aethiopica, Jatropha integerrima, Kallstroemia maxima*, *Kosteletzkya pentasperma, Lagascea mollis, Lantana camara, Malachra* sp., *Malvastrum coromandelianum*, *Manguifera indica, Melochia pyramidata* var. *pyramidata, Mikania micrantha, Momordica charantia, Peltophorum ferrugineum*, *Phyla scaberrima, Pseudelephantopus spicatus*, *Serjania diversifolia, Sida* sp., *Sonchus oleraceus, Spermacoce laevis*, *Spilanthes urens, Tournefortia hirsutissima, Tridax procumbens, Turbina corymbosa, Varronia globosa* ssp. *humilis*. Both sexes sip water from wet soil in hot hours on occasion.
PREDATOR: A *Parastephanops echinatus* was found feeding on a male adult on *Melochia pyramidata* var. *pyramidata*. An unidentified crab spider (Araneae: Thomisidae) was found feeding on a male adult on *Spilanthes urens*. A *Parastephanops* (?) was found feeding on a male adult on *Dichanthium* sp. A *Parastephanops echinatus* (?) was found feeding on a female adult on *Malachra* sp. An *Argiope trifasciata* (Forskal) (Araneae: Araneidae) was found feeding on an entangled adult on *Phyla scaberrima*.
PARASITOID: *Pteromalus* sp. (Hymenoptera: Chalcidoidea: Pteromalidae). More than fifty adults emerged from a pupa of the butterfly.

***Anartia chrysopelea*** Hübner 1825
STATUS: Occasional in groves, along hedge margins and in scrubby sites. This species occurs as strays or dispersing adults and though *A. chrysopelea* and *A. jatrophae* can be found flying together in other localities, the present status of the former at the study areas reflects the lack of suitable wooded sites, which seem to be its preferred habitat. Specimens have been reported for every month but May.
FLOWERS VISITED: *Bidens pilosa*, *Blechum pyramidatum*, *Calopogonium coeruleum*, *Chromolaena odorata*, *Clematis dioica* (male flower), *Lantana camara*, *Mikania micrantha*, *Phyla scaberrima*, *Varronia globosa* ssp. *humilis*.

***Siproeta stelenes biplagiata*** (Fruhstorfer 1907)
STATUS: Occasional to abundant in shady groves, along hedges and roadsides, in open scrubby sites and on the main grounds. During August 1997 and 1998 at Santa Ana, numbers of individuals congregated beneath the shade of a *Cordia obliqua* tree to feed on the fallen fruits of the plant, being the congregation of the former year the more numerous. The adults also fed with the fruits remaining on the tree. In favorable years this butterfly may experience a period of great abundance again in October until early November and at this time the adults have been observed in swarms avidly nectaring on flowers of *Gouania polygama*. *S. stelenes* does breed in the study areas and *Blechum pyramidatum* will probably serve as larval food plant. This species occurs as a resident and though habitat destruction may cause a temporal decrease in abundance, the butterfly reestablishes when conditions return to normal. Specimens have been reported for every month.
FLOWERS VISITED: *Bidens pilosa*, *Cestrum diurnum*, *Chromolaena odorata*, *Citrus* sp., *Clematis dioica* (male flower), *Coccoloba uvifera*, *Gerascanthus laevigatus*, *Gouania polygama*, *Kosteletzkya pentasperma*, *Lantana camara*, *Manguifera indica*, *Mikania micrantha*, *Persea americana* Mill. (Lauraceae), *Phyla scaberrima*, *Pictetia mucronata* (Griseb.) Beyra & Lavin (Fabaceae), *Serjania diversifolia*, *Spilanthes urens*, *Tournefortia hirsutissima*, *Turbina corymbosa*, *Varronia globosa* ssp. *humilis*. Adults also feed on fallen overripe mangoes, bananas and *Coccoloba uvifera* fruits and sip water from wet soil. On one occasion an individual was trying to obtain the exudates from a dry inflorescence of *Lantana camara*, inside it there was a boring moth larva.

***Anthanassa frisia frisia*** (Poey 1832)
STATUS: Occasional to abundant in groves, pastures, along roadsides and in scrubby sites. This is a resident species, and *Blechum pyramidatum*, a reported larval food plant, is abundant and will certainly serve as host. Specimens have been reported for every month.
FLOWERS VISITED: *Bidens pilosa*, *Calopogonium coeruleum*, *Lagascea mollis*, *Phyla scaberrima*, *Spilanthes urens*, *Varronia globosa* ssp. *humilis*.

***Vanessa cardui*** (Linnaeus 1758)
STATUS: I observed two adults in a fallow field and around a cassava plantation on 27 September and 6 December 2000. This species only occurs as strays, and it is a new sight record for the province.

***Vanessa virginiensis*** (Drury 1773)
STATUS: Five specimens were taken on 24 and 25 May 1994 in open scrubby sites around the station. It is remarkable that a great rainy period anteceded the occurrence of these individuals. Another specimen (very fresh) was taken on 31 May 1996 when interrupted its flight for pausing in low shady vegetation in a pasture. This species occurs as strays or dispersing adults.
FLOWERS VISITED: *Bidens pilosa*.

***Vanessa atalanta rubria*** (Fruhstorfer 1909)
STATUS: A worn male was taken while perching open-winged on the branches of an *Ixora* shrub on the main grounds of the station on 13 November 2001. The individual was firstly seen erratically flying and settling on bare soil near the place of its capture. This species only occurs as strays, and it is a new province record.

***Euptoieta claudia*** (Cramer 1779)
STATUS: Uncommon in pastures and scrubby sites. This species only occurs as strays or dispersing adults, mostly during the middle and the end of the wet season. Specimens have been reported for July-October.
FLOWERS VISITED: *Bidens pilosa*.

***Euptoieta hegesia hegesia*** (Cramer 1779)
STATUS: Occasional in pastures and scrubby sites. This species only occurs as strays or dispersing adults, often laying eggs on its passing. Specimens have been reported for every month.
HOST PLANTS: Observed ovipositing on *Passiflora capsularis*.
FLOWERS VISITED: *Allium* sp., *Bidens pilosa*, *Chromolaena odorata*, *Lagascea mollis*, *Phyla scaberrima*, *Spilanthes urens*.

***Doxocopa laure druryi*** (Hübner 1823)
STATUS: Occasional in grove margins at Santa Ana. This species occurs as strays, probably attracted to ripe fruits such as those of *Cordia obliqua*. Specimens have been reported for January, March, April, August, September, and November.

***Asterocampa idyja idyja*** (Geyer 1828)
STATUS: One worn male specimen was taken on 31 July 1996 at Santa Ana, while feeding on overripe bananas placed on the ground in a grove the day before. Another specimen was seen on 7 August that year in the same place. This species only occurs as strays.

***Calisto herophile herophile*** Hübner 1823
STATUS: Abundant in shady habitats, groves, along roadsides and hedges, in open scrubby sites, crop fields and on the main grounds. This species occurs as a resident and may be quite common throughout the year. Specimens have been reported for every month.
FLOWERS VISITED: *Allium* sp., *Alternanthera pungens*, *Asclepias curassavica*, *Bidens pilosa*, *Boerhavia erecta*, *Chamaesyce berteriana*, *Chromolaena odorata*, *Cissus sicyoides*, *Clematis dioica* (male flower), *Cyanthillium cinereum*, *Gerascanthus laevigatus*, *Gouania polygama*, *Kosteletzkya pentasperma*, *Lagascea mollis*, *Malachra* spp., *Manguifera indica*, *Melochia nodiflora*, *Melochia pyramidata* var. *pyramidata*, *Mikania micrantha*, *Momordica charantia*, *Phyla scaberrima*, *Plumbago scandens*, *Rauvolfia tetraphylla*, *Spilanthes urens*, *Tridax procumbens*, *Varronia globosa* ssp. *humilis*.

**Adult and larval resources.** Including ornamental and crop plants, more than 220 plant species may be found in the study areas, yet a number of introduced species can be permanently removed or others newly planted. In total, 182 plants were recorded as food resources for butterflies (115 as nectar for adults and 103 as larval hosts). *Acacia farnesiana, Cardiospermum microcarpum*, and *Carica papaya* were new larval hosts for *Ministrymon azia, Cyclargus a. ammon*, and *Ascia monuste eubotea*, respectively.
The plant families with the greatest number of species were Asteraceae, Fabaceae, Malvaceae, and Poaceae, and are the most used larval host or nectar sources for butterflies. Other plant families very important were Boraginaceae, Rutaceae, Sapindaceae, and Solanaceae.

The majority of plants is in bloom throughout the year and among these *Bidens pilosa, Phyla scaberrima*, and *Spilanthes urens* are the most used, but equally so are *Calopogonium coeruleum* and *Chromolaena odorata* which only bloom during the dry season. Other food sources for some adult butterflies are the fruits of *Coccoloba uvifera, Cordia obliqua, Manguifera indica, Momordica charantia, Musa* sp., and *Tournefortia hirsutissima,* as well as bird and cow droppings.

## DISCUSSION

**Faunal composition.** A final list of 111 species was obtained. This high value, practically the 87% of the total fauna recorded for the province of Camagüey (Fernández y Rodríguez 1998), is only cumulative and does not reflect the actual species richness of the areas but stresses the importance of long-term studies to determine the permanent faunal element of a given locality, and consequently to study future changes in its composition. Of the total, 41 species (37%) were residents, the other 70 species were recorded as stray individuals, dispersing adults, or temporary colonizers.

For this reason, it is possible to consider the areas as natural corridors for species due to the number of butterflies that fly through these sites which permitted to document the great vagility that exhibited many of them. Some species, e.g., the endemics, and members of the Nymphalidae for their known affiliation to well conserved forest formations (Fontenla 1992), are very selective as to habitat preferences and did not find suitable conditions for permanent establishment (as *Siderone galanthis*, *Marpesia eleuchea*, *Historis* spp., and *Anartia chrysopelea*), though the hosts and offsprings may be found. Others, the generalists, have to cope with the larval host plant availability (as *Gesta gesta*, *Battus polydamas*, *Anteos clorinde*, *Chlorostrymon maesites*, and the three *Danaus* species). On the other hand, one interesting case is that of *Nathalis iole* which can be established during shorts periods and later disappearing for several years and both larval host and habitats are available.

Considering the environmental conditions of the study areas none of the resident butterflies (except *Oarisma nanus* ?) was an endemic species, a fact that according to Fontenla (1992), who has documented the patterns of the ecological distribution of this fauna, was expected. Among the endemic subspecies are found *Euphyes c. cornelius, Lucinia s. sida, Dryas iulia nudeola, and Calisto h. herophile*.

In the proportion of species per family obtained in the present paper (residents only) Hesperiidae had the greatest number of species with 18 (44%), followed by Nymphalidae 9 (22%), Lycaenidae 7 (17%), Pieridae 6 (15%), and Papilionidae 1 (2%). With the exception that Lycaenidae and Pieridae exchanged positions (without significance), these data agreed, in general, with those found in other Cuban butterfly communities (Fontenla 1987 a,b; Núñez y Barro 2003), and it is a pattern that characterizes the Cuban fauna as a whole (Fontenla 1987a). On the contrary, the percentages of species

per family did not agree with those reported for agricultural biotopes (Fontenla 1992). In his analysis, Pieridae, occupies the first position, followed by Nymphalidae, Hesperiidae, Papilionidae, and Lycaenidae, which may indicate that the study areas are not typical agroecosystems, or heterogeneity as to the number of collecting man-hours and vegetation associations of previous works.

Based on the available distributional data, three resident butterflies of the community are rare in Cuba (Smith *et al.* 1994): *Lerodea eufala*, *Panoquina o. ocola,* and *Strymon martialis*, the latter known by its restricted coastal range. These findings are a clear evidence that continuing field work, even in disturbed habitats as those comprising the study areas, will contribute to reassess the rarity status for many butterflies. In addition, an interesting group of butterflies, whose distribution is also poorly known, breeds temporarily in the areas: *Achlyodes munroei*, *Rhinthon cubana*, *Melete salacia cubana*, *Allosmaitia c. coelebs*, and *Chlorostrymon m. maesites*, indicating that such species are more widely ranging and ecologically tolerant than record suggested.

Of great interest from an ecological and zoogeographic point of view were the records of the three *Vanessa* species, and specially *V. cardui* and *V. atalanta* which represented new province records. Although they only occurred as strays or dispersing adults, their presence supported the view that well-established colonies of the three species are found in several localities of Cuba, as suggest Alayo y Hernández (1987), but not restricted to the mountain ranges of the center and the east of the island. At least, *V. virginiensis*, is more likely to be seen in lowland habitats in the province.

Another butterfly not previously recorded for the province was *Junonia evarete*. This is a primarily coastal species and the reported larval host, *Avicennia germinans* L. (Avicenniaceae), accounted for the known distribution of the butterfly in such habitat, but the specimens collected or observed at the study areas indicate the existence of the species in inland localities, and that another larval food plant is used. In addition, *Phocides pigmalion batabano*, is now known to occur in a similar situation as to habitat expansion and host use in Cuba (Hernández *et al.* 1998), and that the tendency for inland dispersion of species as *Kricogonia lyside*, *K. cabrearai*, and *Phoebis agarithe antillia*, observed in this study must be an indication that they are not restricted to coastal habitats.

**Local extinction and recolonization.** The hesperiid *Oarisma nanus* became extinct when removing the fields where it was found. What is not known was whether the species was firmly established during its finding or it was occurring as a temporary colonizer. However, such an unconspicuous skipper could still be present in the areas (though observations proved otherwise) or in adjacent lands, but its presence in this agroecosystem indicated a habitat expansion since the species seemed that it strictly depended on xerophytic zones (Fontenla y de la Cruz 1992). Another example of local extinction but successful recolonization occurred with other hesperiid, *Synapte m.*

*malitiosa*. This species, formerly well known as resident, was completely absent for more than two years due to habitat loss. Its residency status was then reevaluated at the end of 1998 to locally extinct. On September 2001 the first individuals of the species were observed again in the site occupied by the former populations, when the habitat had recovered the same vegetational structure as before.

At least a part of the resident fauna frequently experienced the temporary loss or alteration of their habitats, particularly that species associated to most of man-maintained plant communities as crop fields, fallow fields, pastures, and roadsides, due to land management at the station and Santa Ana, with its consequent impact on butterflies. This impact readily influenced the activity or abundance of adults by eliminating local suitable sites where the butterflies could be observed taking nectar, but the more severe effects were on immatures. Adults moved to many other available remaining habitats when needed. Except for *O. nanus* and *S. malitiosa*, the resident community did not suffer any other changes in its composition caused by land use, other than temporary decrease in abundance. In this sense, the present paper represents a prelimary report (though at a very local level and for the most generalist and adaptable species) on the effects of the present agricultural habitat attrition on butterfly populations, which is one of the responsible factors that seemed to have played part in shaping the present Cuban fauna (Smith *et al.* 1994).

**Phenology.** Monthly rainfall distribution in the station is shown in figure 1. The wet season begins in May and extends through October, and the dry season begins in November and ends in April.

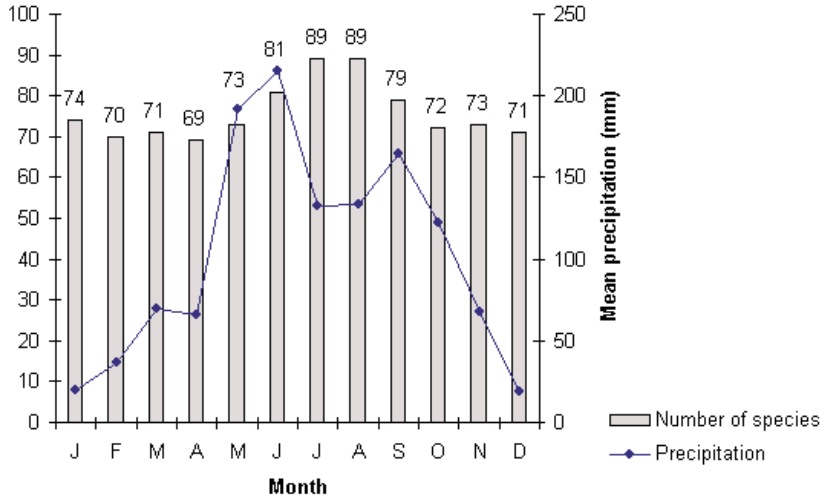


**Figure 1**

Total number of butterfly species and precipitation recorded at each month (long-term mean monthly rainfall data available only for the station)

The cumulative number of species recorded (residents/non-residents) at each month varies from a low of 69 in April to a high of 89 during July/August (Fig. 1). In correspondence with the wettest period, there is a peak of species richness that extends from June through September when most of resident butterflies and temporary colonizers reach their greatest abundance, and the numbers of dispersing adults that fly through the study areas become also higher. Another peak, though small, may occur in January in favorable years, even though this is the second driest month. At this time, some habitats remain with favorable conditions, and a rich seasonal nectar source is available that represents a very important food supply for the fauna during most of the dry season. Consequently, resident species and temporary colonizers may become also numerous, and certain butterflies tend to disperse again during this time. Some larval hosts (as for lycaenids) are also more abundantly bloomed and species as *Allosmaitia coelebs*, *Chlorostrymon maesites, Ministrymon azia, Strymon limenia*, and *Electrostrymon angelia* may be seen with more frequency.

In the period March/April and early May, both areas seem to be practically barren for butterflies due to the empoverishment of habitats. Here, the dispersal movements and strays are scarce, and the populations of resident species decrease (sometimes strikingly) that species as *Asbolis capucinus, Panoquina ocola, Nyctelius nyctelius, Eurema daira* and *Strymon martialis*, may not be observed on a field visit. The species which are more probable to be found on a short sampling time are *Calisto herophile, Anartia jatrophae, Agraulis vanillae, Strymon columella, Strymon limenia, Leptotes cassius, Hemiargus hanno, Eurema lisa, Pyrgus oileus, Perichares philetes, Cymaenes tripunctus, Polites baracoa,* and *Choranthus radians*. After the first heavy rains (e.g., in May), the species that were almost unrecorded begin to appear and increases the activity and abundance of others.

A few butterfly species have different wet and dry season phenotypes. Some differ only slightly between seasons as *Lucinia sida, Eurema messalina*, and *Eurema nise*, but *Siproeta stelenes* and *Eurema daira* are distinctly patterned. In addition to this, the dry season female individuals of the lycaenids *Hemiargus hanno* and *Cyclargus ammon* have the metallic blue of the upperside of wings extended almost to the outer margin. This pattern had been noted by Alayo y Hernández (1987) for the last species only. These female forms are more frequently seen during January-April.

**Pest butterflies.** Of the butterflies with agricultural interest associated with crop plants at the station are *Urbanus proteus domingo, Ascia monuste eubotea,* and *Leptotes cassius theonus* (Alayo y Hernández 1987), but only the second species required attention to avoid damages of interest, especially on *Brassica*. A new plant included in the extensive menu of this polyphagous pierid was *Carica papaya*. The butterfly was first observed using it in 1995 and it has been continuously found on the plant in subsequent years during June/August. Eggs or larvae of early stages have been found abundantly

only on very young seedlings (with cotyledonal leaves and 1-4 true leaves) and on one occasion it required chemical control but neonate larvae can be washed away from leaves when these plants are watered daily, thus reducing survival. In general, this butterfly had no great influence on this plant but its preference for seedlings is noteworthy and it deserves continuous observations in the future.

**Adult and larval resources.** According to Smith *et al.* (1994) the available data of plant resources for butterflies in Cuba, and in general for other Antillean islands, are very incomplete. For this reason, many of the plants used as nectar sources reported in this paper are considered new records.

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