23 Exotic Plants and Butterflies in Southern Florida—The Pros and Cons

Walter Gould
U.S. Department of Agriculture, Agricultural Research Service, 13601 Old Cutler Road, Miami, Florida 33158; miawg@ars-grin.gov

Roger Hammer
Miami-Dade County Parks and Recreation Department, Natural Areas Management, 22200 SW 137 Avenue, Miami, Florida 33170

Abstract

Some butterflies exist in many different habitats, while others are restricted to one particular type of habitat. Loss of habitat is the greatest threat that butterflies face today. The presence of host plants and nectar plants will not always guarantee that a population of a butterfly species will be present. The main threat posed by exotic plants to butterflies in Florida is habitat loss. Two of the worst offenders are Brazilian pepper and melaleuca, species that are invading large areas of southern Florida. In wet prairie and glades, butterflies which can be displaced include the Palamedes swallowtail, little metalmark, Georgia satyr, and numerous wetland skippers like the twain spot skipper. In pineland areas, key pineland butterflies which can suffer include such species as Florida leafwing butterfly, Bartram's hairstreak, palmetto skipper, and Florida dusky wing skipper. Tropical hardwood hammock butterflies that can be displaced include the atala, Florida purplewing, Florida white, and hammock skipper. Some of the hammock butterflies would be less at risk than the other displaced species because the habitat they favor closely resembles habitat found in urban areas such as yards, parks, and fruit groves. Some exotic plants are beneficial to butterflies. A number of species which are widespread weeds in southern Florida actually benefit and increase numbers of butterflies in the surrounding areas. Even Brazilian pepper is not totally useless, since some butterflies seek nectar from its flowers and larvae of the fulvous hairstreak feed on it.

Introduction

Butterflies and plants are inextricably intertwined. The very nature of the butterfly has coevolved with plants: the larval stage of the butterfly is a feeding machine,

and the adult stage is a dispersal and reproduction specialist. The larvae often have specialized food preferences and may feed on only one or a very few species of plants. In many of species of butterflies (and moths), the larvae have the capability to utilize toxic compounds that plants have evolved in the evolutionary race against herbivores. These butterflies may take in the toxins as larvae, sequester them, and maintain them in their body until they are adults, even protecting the eggs these adults lay from predation! Some species of butterflies use these plant toxins to home in on their preferred hosts.

Butterflies visit flowers as adults and use the nectar and pollen to nourish themselves (and in the process, pollinate flowers). Butterflies are dependent on plants for both larval and adult nourishment. Plants also frame the environment the butterfly lives in and interacts with. Habitat is a term that describes the total environment the organism lives in. Some butterflies exist in many different habitats. Others are restricted to one particular type of habitat. Loss of habitat is the greatest threat that butterflies, and most other species of animals, face today. The presence of host plants and nectar plants alone will not always guarantee that a butterfly species will survive in an area. When the area a species inhabits becomes too small and fragmented, they are more likely to become extinct in that area as they are subjected to environmental stresses, competition, parasitism, and predation.

Habitat Loss Caused by Exotic Plants

Large areas of habitat in Florida are being taken over by exotic plants. Two of the major offenders are Brazilian pepper (*Schinus terebinthifolius* Raddi, Anacardiaceae) and melaleuca (*Melaleuca quinquenervia* (Cav.) S.T. Blake, Myrtaceae).

Melaleuca was introduced to Florida from Australia as an ornamental and to dry up the Everglades for agriculture and development. It has invaded large areas of wet prairie and glades in southern Florida. Butterflies that are found only in these areas will find their habitats greatly reduced if melaleuca spreads unchecked. Some key butterflies that are found in these environments are the Palamedes swallowtail (*Papilio palamedes* Drury, Papilionidae), little metalmark (*Calephelis virginiensis* Guérin-Ménéville, Riodinidae), Georgia satyr (*Neonympha areolata* J.E. Smith, Satyridae), and numerous wetland skippers like the twin-spotted skipper (*Oligoria maculata* W.H. Edwards, Hesperiidae) (Table 1). These butterflies are usually very common, and even if their habitat was reduced, they would probably survive despite their diminished populations.

A Brazilian native introduced to Florida by the U.S. Department of Agriculture in 1898, Brazilian pepper is usually found in drier areas and is especially common in places disturbed by man. Any area that has been farmed and left fallow usually becomes overgrown with this pest. The rapid growth of this plant prevents the

Table 1. Some key butterflies species threatened by habitat loss in southern Florida due to exotic plants.

Common name	Scientific name	Family	Larval host plant	Habitat	Threat
Palamedes swallowtail	*Papilio palamedes*	Papilionidae	Red bay	Wet prairie	Melaleuca
Schaus' swallowtail	*Papilio aristodemus ponceanus*	Papilionidae	Wild lime, torchwood	Hardwood hammock	Melaleuca, Brazilian pepper
Bartram's hairstreak	*Strymon acis bartrami*	Lycaenidae	Wooly croton	Pineland	Brazilian pepper
Little metalmark	*Calephelis virginiensis*	Riodinidae	Yellow thistle	Wet prairie	Melaleuca
Florida leafwing	*Anaea floridalis*	Nymphalidae	Wooly croton	Pineland	Brazilian pepper
Florida purplewing	*Eunica tatila*	Nymphalidae	Crabwood	Hardwood hammock	Melaleuca, Brazilian pepper
Georgia satyr	*Neonympha areolata*	Satyridae	Sedges	Wet prairie	Melaleuca
Florida duskywing skipper	*Ephyriades brunnea floridensis*	Hesperiidae	Locustberry	Pineland	Brazilian pepper
Hammock skipper	*Polygonus leo*	Hesperiidae	Jamaican dogwood	Hardwood hammock	Melaleuca, Brazilian pepper
Palmetto skipper	*Euphyes arpa*	Hesperiidae	Saw palmetto	Pineland	Brazilian pepper
Twin-spotted skipper	*Oligoria maculata*	Hesperiidae	Grasses	Wet prairie	Melaleuca

return of native plants to disturbed areas that were originally pineland or tropical hardwood hammock. Many pineland butterflies can be affected, if not eliminated, if this plant's spread is not controlled. Species such as the Florida leaf wing (*Anaea floridalis* F. Johnson & F.P. Comstock, Nymphalidae), Bartram's hairstreak (*Strymon acis bartrami* W.P. Comstock & Huntington, Lycaenidae), palmetto skipper (*Euphyes arpa* Boisduval & Leconte, Hesperiidae), and Florida dusky wing skipper *(Ephyriades brunneus floridensis* Bell & W.P. Comstock, Hesperiidae) are found mainly in pineland habitat (Table 1).

Both melaleuca and Brazilian pepper can invade tropical hardwood hammocks. Some of the species of butterflies found mainly in these communites include Schaus' swallowtail (*Papilio aristodemus ponceanus* Schaus, Papilionidae), Florida purple wing *(Eunica tatila* Herrich-Schäffer, Nymphalidae), and hammock skipper (*Polygonus leo* Gmelin, Hesperiidae) (Table 1). Schaus' swallowtail is confined to Elliott Key, North Key Largo, and some transplantings on the mainland. Degradation of this endangered butterfly's habitat is a very serious threat because of its limited range in southern Florida. Local events such as Hurricane Andrew can have a devastating effect on these restricted populations. Some of these butterflies would be less at risk than some other displaced species because the tropical hardwood habitat they favor is recreated in backyards, urban parks, and fruit groves. Many of the large hammock-inhabiting skippers can be found in these artificial environments.

The much reviled Brazilian pepper also produces numerous flowers that attract butterflies like long tailed skippers (*Urbanus proteus* L. and *U. dorantes* Stoll, Hesperiidae). Brazilian pepper doesn't attract as many butterflies as some of the native flowering plants like bloodberry (*Cordia globosa* (Jacq.) Kunth, Boraginaceae), blazing-star (*Liatris* spp., Asteraceae), and wild tamarind (*Lysiloma latisiliquum* Benth., Fabaceae). In addition, there is at least one species of butterfly, the fulvous hairstreak *(Electrostrymon angelia* Hewitson, Lycaenidae), that uses the Brazilian pepper as its only larval host plant in southern Florida.

Beneficial Exotics

There are three milkweed butterflies native to southern Florida, the monarch (*Danaus plexippus* L., Danaidae), queen (*Danaus gilippus* Cramer), and soldier (*Danaus eresimus* Cramer). These butterflies use many species of milkweeds, both native and non-native, as larval hosts. Many native milkweeds, such as butterfly weed (*Asclepias tuberosa* L., Asclepiadaceae) and *A. lanceolata* Walt., are relatively uncommon, especially since much of the native pineland and freshwater wetland habitats have been reduced by urbanization. There are two milkweeds, the white vine (*Sarcostemma clausum* (Jacq.) Roem. & Schult., Asclepiadaceae) and scarlet milkweed (*Asclepias curassavica* L., Asclepiadaceae), that are major hosts to monarch and queen butterflies in southern Florida (Table 2). These pantropical weeds are

found in many disturbed areas, and the scarlet milkweed is often planted by butterfly gardeners. Without these plants, both monarch and queen butterflies would be relatively uncommon in southern Florida.

Table 2. Introduced plants that are larval hosts to butterflies.

Scientific name	Common name	Butterfly hosted
Sarcostemma clausum	White vine	Monarch, queen
Asclepias curassavica	Scarlet milkweed	Monarch, queen
Zamia fischeri	Cycad	Atala
Aristolochia gigantea	Pelican vine	Gold rim
A. ringens	Pelican vine	Swallowtail
Canna spp.	Canna lily	Brazilian skipper
Blechum pyramidatum	Green shrimp plant	Malachite
Albizia lebbeck	Woman's tongue tree	Maesites hairstreak
Leucaena leucocephala	Lead tree	Light banded hairstreak

The Florida atala butterfly (*Eumaeus atala* Poey, Lycaenidae) is back from the brink of extinction. Early authors writing about this species speak of it swarming in southern Florida. By 1949, when the original *Peterson Field Guide* to butterflies was published, it pronounced the atala butterfly nearly (if not actually) extinct. In the last few years, it had been found swarming in areas planted with ornamental and non-native cycads. These plants have provided a substitute for the native *Zamia pumila* L. (Zamiaceae) whose numbers declined with the decline of native pinelands. *Zamia fischeri* Miq. (Zamiaceae), a popular ornamental cycad native to Mexico, is actually preferred by the atala butterfly over the native larval host plant (Table 2).

The gold rim swallowtail (*Battus polydamus* L., Papilionidae) has only one native larval host plant in southern Florida, *Aristolochia pentandra* Jacq. (Aristolochiaceae). This vine is found only on Elliott Key, so the gold rim swallowtail would be very rare if it did not have cultivated species of *Aristolochia* available to it. In particular, it uses *A. gigantea* Mart. & Zucc. and *A. ringens* Vahl, as well as others in the family, that are planted in butterfly or other gardens (Table 2).

A number of exotic plants are commonly planted by butterfly gardeners to attract butterflies. Most of these plants do not have great potential to become weeds, but careless introductions may eventually turn into problems. A number of imported

plants, such as relatives of blue porterweed (*Stachytarpheta jamaicensis* (L.) Vahl, Verbenaceae), have been commonly sold as butterfly garden plants.

Introduced Butterflies and Host Plants

The Brazilian skipper (*Calpodes ethlius* Stoll, Hesperiidae) is a large black skipper butterfly that ranges from northern United States to South America. It is only common where its main larval host, canna lily *(Canna* spp., Cannaceae), is found (Table 2). In southern Florida, the butterfly is usually found where canna lilies are or were cultivated. Canna lilies spread slowly and persist for many years after deliberate cultivation stops, as evidenced by a clump of indian shot (*Canna indica* L.) found on the Deering Estate area in southeastern Miami-Dade County. Anyone growing canna lilies for their flowers will be troubled by this skipper's rapid devastation of the plants. In this case, the butterfly probably keeps these plants in check and prevents or slows their spread. If cultivated canna lilies were removed from urban areas, the Brazilian skipper would become a rare butterfly in southern Florida.

The malachite (*Siproeta stelenes* L. Nymphalidae) is a beautiful green butterfly said to have come to southern Florida from Cuba in the 1960s or 1970s. Its host plant is the green shrimp plant (*Blechum pyramidatum* (Lam.) Urb., Acanthaceae) (Table 2). This plant is common in many areas but the butterfly is not. The malachite seems restricted to certain types of habitats; the only place where it is commonly seen is in and near fruit groves. This may be due, at least in part, to the adult butterfly's preference for feeding on rotting fruits. In other parts of the world, many species of butterflies share this habit, but in southern Florida this is one of only a few species attracted to rotting fruits.

The maesites hairstreak (*Chlorostrymon maesites* Herrich-Schäffer, Lycaenidae) is a beautiful green hairstreak found in the Florida Keys. The larvae have been reported to feed on an exotic tree (*Albizia lebbeck* (L.) Benth., Fabaceae) that is native to Southeast Asia (Table 2). Since this tree is extremely common in southern Florida and the butterfly is limited in its distribution to the Keys, this may be an adapted host rather than the original host of the butterfly.

The light banded hairstreak (*Tmolus azia* Hewitson, Lycaenidae) is a recent introduction (1974) to southern Florida from Central or South America. The larvae feed on the lead tree (*Leucaena leucocephala* (Lam.) de Wit, Fabaceae) (Table 2). This tree is an exotic that invades disturbed areas, pinelands, and hammock margins and is considered very undesirable.

Conclusion

Exotic plants are a major problem in native ecosystems in southern Florida. The two worst invaders of native habitats are probably melaleuca and Brazilian pepper. Both of these species, if left unchecked, will reduce habitat and host plants available for a number of butterflies. Probably a greater threat to butterflies is man's destruction of natural areas and urbanization. The butterfly populations that can be seen in urban southern Florida differ greatly from those in large, unpopulated natural areas, such as the national parks. If these parks lose the battle with invading species, some butterfly species could become uncommon or rare. In cases where the butterflies are already restricted, like Schaus' swallowtail, invading plants could tip the balance and push the species towards extinction. Butterfly gardening has become very popular in recent years and many of the plants that are used are not native to southern Florida. This trend may lead to problems if introductions are not monitored. Man has already had an enormous impact on Florida butterfly populations. If exotics continue to increase in southern Florida, some species of butterflies will probably suffer.