

Exotic Weeds THAT Threaten THE Caribbean:



Colubrina asiatica in Dangriga, Belize



A BRIEF OVERVIEW AND EARLY ALARM CALL.

By Richard Moyroud

South Florida has a recent history which is highlighted by the introduction of plant species from distant parts of the world. Some of these plant importations have proven to be extremely harmful to the natural environment and human infrastructure, thus instigating work leading to a better description of the problem and control

measures. Concerned individuals in Florida were the first in the United States to organize a council to identify the most serious pest plants and compare notes on control methods, if any. The Florida Exotic Pest Plant Council was established in 1984, and one of the early documents created was a checklist of the pest plants recognized at that time. Today, the list includes more than 120 species in two categories, based on

oral and written field reports compiled from a wide spectrum of observers (FLEPPC 1996, 1999). Category 1 plants are considered the most serious, since these are defined as "Species that are invading and disrupting native plant communities in Florida." Category 2 species have "shown a potential to disrupt native plant communities."

An equally important issue is the effort to prevent the introduction of

any new pest plants. Many researchers agree that one of the best predictors of invasiveness is invasive behavior documented elsewhere. Caribbean Islands and the Central American coastline share a large number of native and exotic plant species with Florida. Many of the pest plants in Florida are just beginning to appear in the Caribbean, and may become pests at least as serious as they are in Florida. There are enough signs to warrant thorough research and perhaps early control efforts.

Surveys by the author throughout the Caribbean region - sometimes in the company of expert botanists, or armed with the most recent floras of the region - suggests that the disruption of native plant communities is in the earliest stages of development. Climatic or edaphic conditions, competition with other species, and existing herbivores may slow or arrest the explosive growth of some pest plant species, but it would be wise to eradicate the relatively small nuclei of the worst pest plants as soon as possible.

Bermuda has recently discovered the harmful effects of introduced ex-

otics, and has successfully used the Florida EPPC list to evaluate species which are beginning to show pest plant behavior. This program of early recognition and prompt response is a model for other islands (Francis 1999).

In the Bahamas, there are coastal and forest plant communities similar to those in South Florida, complete with many of the same invasive species. Of the pest plant species listed for Florida, 29 of the 65 in category 1, and 26 of the 58 in category 2 occur in the Corrells' *Flora of the Bahamas Archipelago*, some with a warning of the incipient harm, based on the authors' observations of the species in Florida (Correll and Correll 1982). In addition to disruption of native plant communities, pest plants have been observed in habitats critical to endangered fauna. In the Bahamas, critically endangered rock iguanas (*Cyclura* spp.) are now restricted to small, rocky cays where they subsist on native plants, but need loose sand in which to dig nests for their eggs. Australian pine (*Casuarina* sp.) has been observed with extensive, impenetrable root systems in the only sandy spot on one such cay,

thus interfering with *Cyclura* reproduction (International Iguana Society Field Expedition, March 1992). Brazilian pepper (*Schinus terebinthifolius*) has been seen on other remote islands, and could also interfere with nesting sites. Near the airport on San Salvador Island, one small population of fruiting *S. terebinthifolius* was observed in June of 1994; it may still be possible to eradicate this species from this and other islands before the populations expand to unmanageable dimensions.

In the drier islands (Turks and Caicos group, St. Croix, etc.), or on dry sides of larger islands, giant milkweed (*Calotropis procera*) and rubber vine (*Cryptostegia grandiflora*) are well established and spreading (Nellis 1997.) These highly poisonous plants add another dimension to the issue, as livestock or humans (including tourists) could be harmed by these unwanted plants.

In the Greater Antilles (Cuba, Jamaica, Hispaniola, and Puerto Rico), approximately half of both Category 1 and Category 2 of Florida's pest plants show up in recently published floras (Adams 1972, Liogier and Martorell

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1982, Borhidi 1991.) Ironically, there are a few species considered native to the West Indies which appear on the EPPC lists, but this does not alter the argument against the other species. Similarly, some species native to Central America, such as *Mimosa pigra* and *Leucaena leucocephala*, have behaved as pest plants when introduced into the Caribbean islands.

In islands with significant agricultural production, the focus has been on unintentionally introduced crop weeds, but some pest plants are known to originate from ornamental introductions. Cuba has had a long standing problem with *Dichrostachys cinerea*, a small thorny shrub introduced from Madagascar for its attractive flowers (Borhidi 1991). This species (called "aroma" in Cuba) infests many areas, displacing native plant communities and interfering with access to coastal sites. *D. cinerea* is also established in Florida, and has been found germinating in coastal strand of the lower Keys after the disturbance caused by Hurricane Georges in 1998 (Robert W. Ehrig, personal communication.) It is possible that the seeds for this most recent invasion were brought to Florida by the hurricane. The establishment of pest plants in the Caribbean has obvious implications for Florida, since the unrestricted movement of propagules by wind, water, and human transport is well known.

In Jamaica and Puerto Rico, the damage caused by pest plants may be more subtle. The exotic *Selaginella willdenovii* has invaded the understory of some forests (Proctor 1985). This species has long clambering stems and is displacing a variety of native species. *Erythrina poeppigiana* was introduced from Peru as a fast-growing shade tree, but is now spreading throughout many forests, perhaps replacing the

native *Erythrina* species. Rose apple (*Syzygium jambos*) is now a common component of the understory throughout the Caribbean, but probably passes unnoticed, thus allowing the species to become firmly established. Finally, rivers such as the Rio Cobre in Jamaica are choked with *Hydrilla verticillata*, but no attention is given to the problem (George R. Proctor, personal communication).

In the Lesser Antilles, there are many pest plants now identified as "weeds," again with an emphasis on crop pests (Fournet and Hammerton 1991). Some of these are well-known pests in Florida, but in stark contrast to the experience in Florida, Australian *Melaleuca quinquenervia* is known in the French Antilles as a pleasant ornamental which does not yet show invasive behavior. Still, approximately half of the Category 1 and half of Category 2 plants from the Florida EPPC list are included in the *Flora of the Lesser Antilles* (Howard 1979).

The nation of Belize is located on the Caribbean Coast of Central America, and is bordered to the north by Mexico and to the south and west by Guatemala. Formerly known as British Honduras, it has had a long history of British forestry activity, including the introduction of exotic species. Few exotics were noted in vegetation checklists published twenty years ago (Spellman *et al.* 1975, Dwyer and Spellman 1981.) Today we can see *Casuarina* spp., *Gmelina arborea* Roxb., and teak (*Tectona grandis*), all introduced as potential forest resources, but all of seemingly limited expansion at this time. Most recently, two species have come to light which could represent the earliest phase of pest plant invasion. Latherleaf (*Colubrina asiatica*) an aggressive sprawling shrub, is now recognized as a severe problem in the southern coastal areas of Florida. One isolated population has recently been seen in a mangrove fringe in South Central Belize, where it has the potential to invade large areas, both natural and farmed (shrimp farms are currently the most important activities in this area). It may not be possible to establish how and when the first plants arrived, but the current population is small enough to be easily eradicated. Australian cajeput or paperbark trees (*Melaleuca* spp.) are evident in several regions of the country, and were certainly introduced as part of the early forestry activity. Records may exist with details of species used, origins, and planting sites. Until recently, the mature trees seemed to be confined to planted groves, and reproduction was not evident. One small population of old trees (tentatively identified as *Melaleuca leucadendron*) on a coastal sand berm may be approaching the century mark, and despite the presence of capsules with seeds, no seedlings were found anywhere in the vicinity. Unfortunately, another population near the international airport has been observed to be reproducing rapidly, with many size class individuals spreading from a core population. Given the extensive seasonal savanna areas adjacent to this site, and knowing the behavior of a related species in Florida (*M. quinquenervia*), we may be seeing the early phase of an invasion, which could easily be arrested before the cost becomes prohibitive, and before irreversible ecological damage is done.

This brief overview of exotic plants in the Caribbean offers a glimpse of a new, underestimated ecological prob-

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lem. In many cases, the results of ecological abuse or alteration are quickly made visible. In the world of plants, the changes are often slow and subtle, and may escape detection until the damage is extreme. For the people who live in the islands or mainland, there will always be questions of resource use and protection. In addition, social priorities may delay any response to the pest plant issue. Given our experience in Florida, it seems that the investigation of pest plants in the Caribbean is an ideal subject for educators, researchers, agencies, and others who have an interest in the health of the ecosystems and people of our nearest neighboring lands.

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Melaleuca leucadendron in All Pines, Belize



Melaleuca leucadendron near the Belize National Airport, Belize

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