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# FIRST RECORDS FOR *DIEUCHES ARMATIPES* (HETEROPTERA: RHYPAROCHROMIDAE) IN NORTH AMERICA

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*Dieuches armatipes* (Walker), a moderately large lygaeoid that occurs throughout Africa, has been discovered recently in several Florida counties. Previously, it had been intercepted by the U.S. Department of Agriculture, APHIS/PPQ, at several Florida ports-of-entry. In Africa, *D. armatipes* feeds on peanuts (*Arachis hypogaea* L.) during the harvesting process; thus, this species has the potential to become a serious pest in northern Florida. In this paper, we give the first United States records of *D. armatipes*, review the literature, provide a diagnosis, and discuss its pest potential.

Henry and Froeschner (1993) gave the first New World records of *D. armatipes* from the West Indies, based on collections from Dominican Republic, Grand Cayman, Jamaica, and St. Kitts. It also has been collected in St. Croix and Cayman Brac (R. M. Baranowski 2003, pers. comm.). In the Old World, *D. armatipes* is distributed throughout Africa and as far north as Spain (Andalucia) (Eyles 1973).

In his world review, Eyles (1973) redescribed *D. armatipes* and included a key to all species of *Dieuches*, photographs of adults, and illustrations of genital capsules, parameres, and spermathecae. At present, 132 species of *Dieuches* are known (Eyles 1995). Henry and Froeschner (1993) redescribed the adult of *D. armatipes* and included dorsal and lateral photographs of an adult female to help distinguish it from other rhyparochromid species in the United States.

## Diagnosis

*Dieuches armatipes* (Fig. 1) is distinguished from other rhyparochromids in Florida primarily by its large size (up to 11.5 mm long). Additionally, it may be recognized by the following characters: dark brown to nearly black, antennal segment IV dark brown with a wide subbasal white band, corium with a large isolated subapical white marking, relatively large eyes, labium ending between midcoxae, lateral pronotal margins lamellate, and forelegs incrassate and armed with two rows of spines.

## Collection Records

The following acronyms and abbreviations are used: RMBC—Richard M. Baranowski collection, Homestead, Florida; FSCA—Florida State Collection of Arthropods, Gainesville, Florida; VGC—Vince Golia collection, Boynton Beach, Florida; JECC—J. Eric Cronin collection, Gainesville, Florida; ABSC—Archbold Biological Station collection, Lake Placid, Florida; MV—mercury vapor; BL—black light.

In Florida, *Dieuches armatipes* has been intercepted with various commodities imported through Ft. Lauderdale, Miami, and West Palm Beach; it also has been intercepted in Puerto Rico and Texas (T. Dobbs 2003, pers. comm.). The first specimen (female) collected in the United States has the following label data: Florida, Palm Beach Co., Delray Beach, Country Lake, 2-VII-1992, dead in pool, Vince Golia (RMBC). The following are label data from other material collected in Florida (Fig. 2): PALM BEACH COUNTY. 1 (sex unknown), Delray Beach, 9-VIII-1994, MV light, V. Golia (RMBC); 1 same but ♂ (FSCA, #E2002-5964); 1♂, Delray Beach, Country Lake, 28-VI-1995, MV light, V. Golia (VGC); 1♂, same but 26-VIII-1995 (VGC); 1♂, same but 9-IX-1995 (FSCA); 1♀, same but 23-V-1996 (FSCA); 1♀, same but 12-VIII-1997, BL (VGC); 2♂ 1♀, Boynton Beach, Nautica Sound, 26-V-2001, V. Golia, MV Light (FSCA). ALACHUA CO. 1♀, Gainesville, 27-V-1999, BL trap, J. E. Cronin (JECC, FSCA #E1999-1561); 1♀, Gainesville, 10014 SW 87 Terrace, 18-IX-2002, BL, Lyle J. Buss (at Univ. of Florida); 1 same but ♂ (FSCA). POLK CO. 1♂, Winter Haven, 5-XII-2002, in a citrus tree, in a Jackson trap with trimedlure bait, Martha A. Simpson (RMBC, FSCA #E2002-5918); 19 adults and nymphs, Winter Haven, 23-XII-2002, on ground under and between citrus trees, J. Brambila and S. E. Halbert (FSCA, #E2002-6120 through 6122). ST. LUCIE CO. 1♂, Ft. Pierce, 30-V-2003, on ground under fallen sabal palm frond, Ken Hibbard (FSCA, #2003-2291). HENRY CO. 1♂, LaBelle, Duda Farms, 25-VIII-1-IX-2000, aphid suction trap, M. Terrell (FSCA); 1♀, same but 13-19-X-2000 (FSCA). HIGHLANDS CO. 2♂, Lake Placid, Archbold Biological Station, 10-X-1997, MV light, Mark Deyrup (ABSC); 1 (abdomen missing), Lake Placid, ABS, 24-VI-2001, MV, V. Golia, (VGC). LEVY CO. 1♂, 1♀, Williston, 25-VIII-2003, in a peanut field, A. Drew, S. Krantz, and S. E. Halbert (FSCA, #E2003-3803).

## Biology

In Africa, *D. armatipes* has been collected under *Mimosa*, a legume that could be its native host, although direct observation of feeding on its

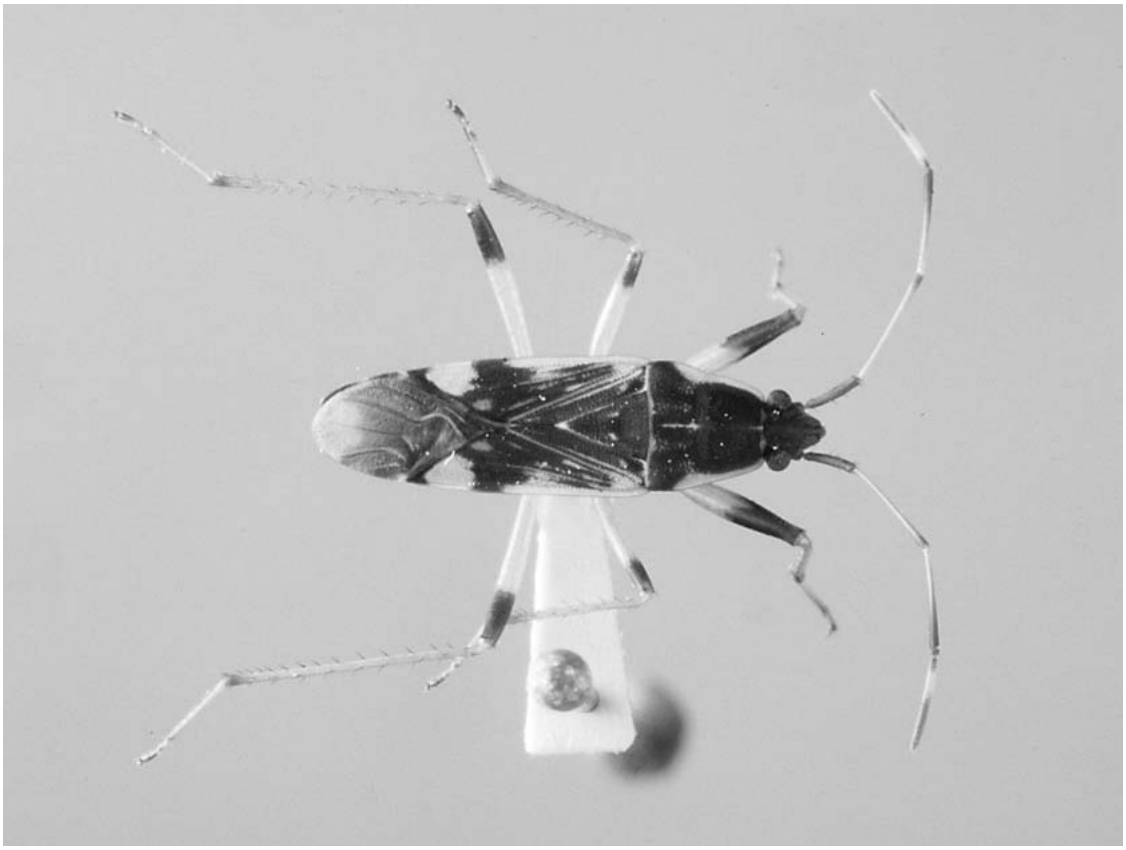

Fig. 1. Dorsal view of an adult *Dieuches armatipes* (Walker).

seeds was not reported; it also has been collected under stones and along the roadside at 1,200 meters above sea level in mixed grasses and herbs (Eyles 1973). This species reportedly feeds on harvested peanuts, a legume introduced from South America into Africa in the 16th century (Hill 1975). In Grand Cayman, West Indies, *D. armatipes* has been collected under coastal plants (R. M. Baranowski 2003, pers. comm.).

In Florida, *D. armatipes* has been found on dry sandy soil in leaf litter under and between citrus trees and under weeds between rows of trees. The only seeds apparently available at the collection site were those of native sandspurs, *Cenchrus brownii* Roemer & J. A. Schultes (Poaceae); puncture vine, *Tribulus terrestris* L. (Zygophyllaceae); and *Citrus* sp. (Rutaceae). We observed *D. armatipes* feeding on sandspur and puncture vine seeds in captivity. The bugs were maintained in the laboratory in plastic Petri dishes with dry sand, green and mature seeds, a vial with cotton and water, and dry, curled citrus leaves from the ground. Adults lived up to 4 weeks and were observed drinking, feeding, mating, and molting. A male and a female were collected in a peanut field in Levy Co. In captivity, they fed on shelled and unshelled peanuts. Eggs were deposited in a moist cotton ball, as well as on the peanuts, peanut stems, and on dry leaves. Nymphs fed on shelled and unshelled peanuts.

## Pest Potential

According to Eyles (1973), *D. armatipes* is a serious pest of harvested peanuts in Africa. When the plants are inverted to expose the peanuts to the air for drying, or when stored outdoors in heaps, these bugs pierce the pods and suck the oil from the nuts, causing them to shrivel and to become rancid and bitter, and sometimes reducing the percentage of germination by one-half (Risbec 1941). Currently, there is no record for *D. armatipes* occurring in the panhandle of Florida, the major peanut production area. However, it has been found in a peanut field in Levy Co., in north central Florida. Harvested peanuts in the drying stage have received little scrutiny for pests as a result of mechanical harvesting and threshing practices. In Florida, the peanut plants are turned over in the field and left to dry for 3 to 4

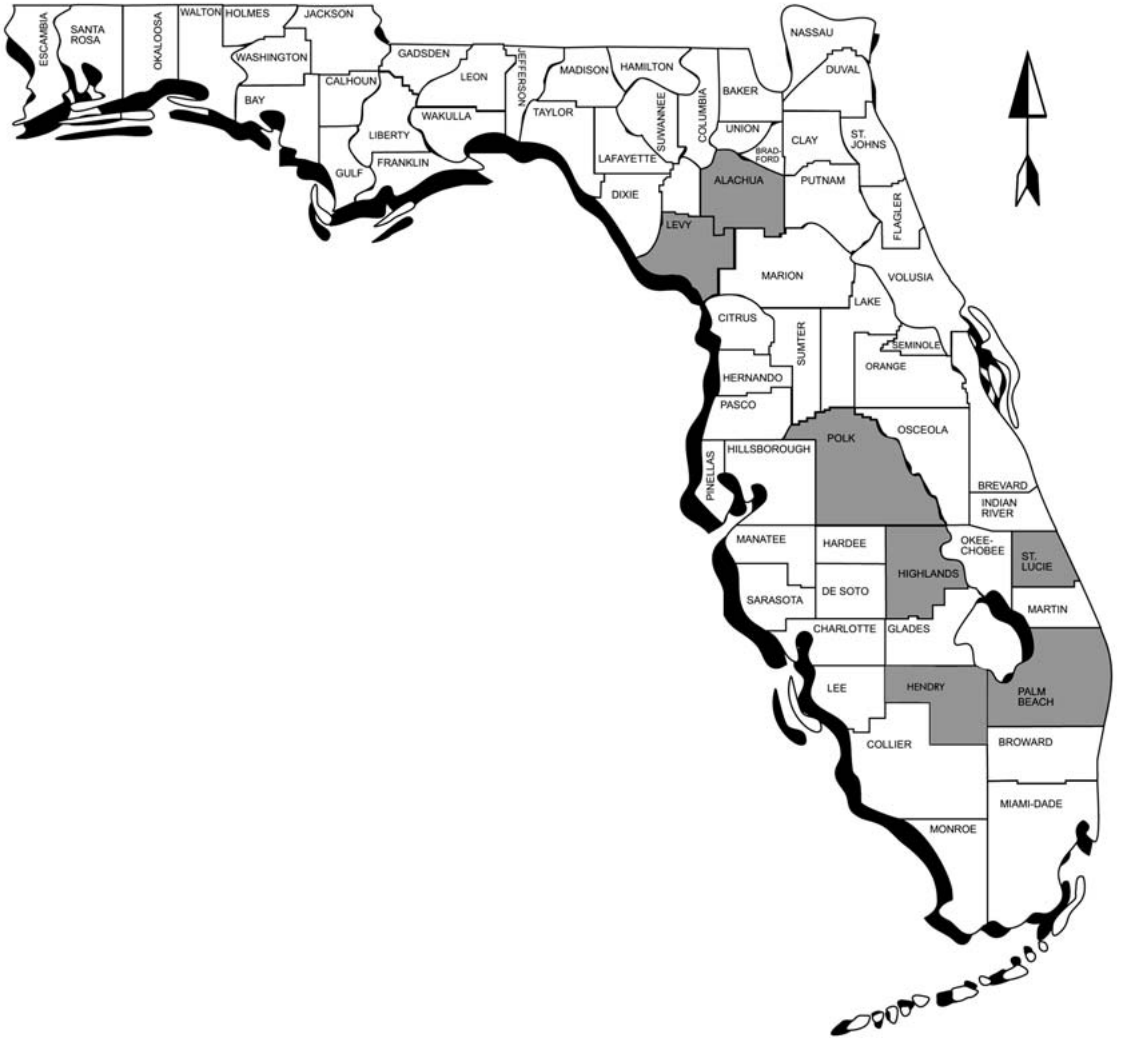


Fig. 2. Florida distribution of *D. armatipes*.

days (or longer if it rains); then, after threshing, they are placed in a wagon with a false bottom and dried in hot air (approx. 15-20°F above ambient) either on the farm or at the peanut buying stations (R. K. Sprenkel 2003, pers. comm.).

Peanuts are grown in at least 17 Florida counties. In year 2000, 94,000 acres of peanuts were planted in Florida, 86,000 acres of which were planted for dry peanuts, yielding 2,485 pounds per acre (FDACS 2002). Cash receipts of $53.64 million for 213 million pounds of peanuts made Florida the sixth largest producer in 2000. Jackson and Santa Rosa are the top two peanut-producing counties in the state. More surveys and inspections are planned for the coming harvest season by FDACS department surveyors, especially for these two counties.

Management Options

Management options include chemical treatment, weed control, and biological control. Risbec (1941) recommended not storing peanuts in previously infested premises without first spraying with an emulsion of oil and soap. Weed control might help prevent the build-up of *D. armatipes* population prior to harvest.

Several natural enemies are associated with *D. armatipes* in Africa. Eyles (1973) listed lizards, reduviids, *Nabis* spp., carabid beetles, *Anystis* and *Treatia* mites, *Pholcus* spiders, and jumping and lycosid spiders as predators on adult and immature *Dieuches*. Although the bethylid parasitoid *Cephalonomia* sp. (Hymenoptera) was listed as an egg parasitoid of *D. armatipes* by Eyles

(1973) quoting Risbec (1941), the latter author indicated that it was only reared in association with this species. Indeed, *Cephalonomia* wasps are known only to parasitize pupae or larvae of small Coleoptera in cryptic situations (Krombein 1979). The effectiveness of natural enemies in mitigating the pest status of *D. armatipes* is not known since most, if not all, of its known natural enemies are generalist predators. Classical biological control should be pursued with great caution. Modification of harvesting, drying, storing, and shipping methods could minimize losses in the event that this species becomes a pest in Florida.

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## Summary

*Dieuches armatipes* (Walker), previously known to occur only in Africa and the West Indies, has become established in Florida. At present, the northernmost occurrence of *D. armatipes* is Gainesville. This species feeds on a variety of seeds on the ground. It has serious pest potential in northern Florida because it has been observed to feed on peanuts.

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