NEW NORTH AMERICAN RECORDS OF THE ASIAN SPECIES, SIMPLICIA CORNICALIS, IN FLORIDA AND LOUISIANA (LEPIDOPTERA: NOCTUIDAE: HERMINIINAE)

TERHUNE S. DICKEL 1,6, VERNON A. BROU, Jr. 2,6, and J. B. HEPPNER 3,4,5

1 P. O. Box 567, Anthony, Florida 32617, USA
2 74320 Jack Loyd Rd., Abita Springs, Louisiana 70420, USA
3 Florida State Collection of Arthropods
4 DPI, FDACS, P. O. Box 147100, Gainesville, Florida 32614, USA

ABSTRACT.—The Old World tropical species, Simplicia cornicalis (Fabricius), the magas fruit-borer, is recorded for the first time from North America in the states of Florida and Louisiana. Autumn records are documented for captures since 2006 in central Florida and since 2008 in southern Louisiana. The species is known throughout Southeast and East Asia, from India to southern Japan, to Australia and New Guinea, as well as from Hawaii and the South Pacific islands, feeding mostly on dried plant leaves and plant debris, rotting seed pods, and particularly palm thatch. Rapid spread in the southeastern United States is likely, possibly also to Mexico and Central America.

KEY WORDS: Asia, Australia, China, distribution, faunas, Fiji, Florida, Hawaii, Herminiinae, hostplants, India, Japan, Korea, Louisiana, Rapa, Nearctic, New Caledonia, New Guinea, Nodaria, Norfolk Id., Oriental, Samoa, Simplicia, Southeast Asia, Taiwan, Thailand, tropical, United States.

Fig. 1. Simplicia cornicalis (wingspans, 22-26mm): a) male, Florida (Lake Placid) (CNC); b) female, Louisiana (Abita Springs) (VAB).

The Old World tropical genus, Simplicia Guenée, includes numerous species, most of which have a very uniform appearance. Poole (1989) listed 54 species, ranging from Africa to New Guinea. Poole included two species from the Neotropics originally described in the genus, but the figure at least of S. monacha Maassen (in Weynier and Maassen, 1890) show the species to belong to another genus. For the Borneo fauna, Holloway (2008) synonymized 7 species of Simplicia, elevated one to valid status, and added 4 new species. Thus, the current total for Simplicia in the world is 52 species, with many additional species remaining to be named.

It came as some surprise to find a species of Simplicia (Fig. 1) in central Florida in 2006, Simplicia cornicalis (Fabricius), and the first record for North America. In 2007, and more in 2008 and 2009, the species was collected in north-central Florida, adding to specimens from 2006 at the original site at Archbold Biological Station, Lake Placid, Florida (Lafontaine, pers. comm.). The species was not known of in North America prior to these recent years (Heppner, 2003). In 2008, the species was also collected in southern Louisiana (VAB), and additional specimens were taken there in 2009.
Records for *S. cornicalis* in Florida and Louisiana are as follows:

**FLORIDA**
- Gainesville (SW), 16 Sep 2008 (1m, 1f); 15 Sep (1f) and 23 Sep 2009 (1f), H. L. Kons, Jr. (HLK)
- Payne Prairie St. Pres., Micanopy, 31 Oct 2007 (1f), G. A. Austin & P. Z. Goldstein (MCLB)
- Levy Co., Goethe St. For., 7 Dec 2009 (1f), 17 Dec 2009 (2m, 4f), at bait, T. S. Dickel (TSD)

**LOUISIANA**
- St. Tammany Par.
  - Abita Springs, 27 Nov (1f) and 1 Dec 2008 (1f); 29 Aug (1f), 11 Sep (1m), 8 Oct (2m), 10 Oct (1m), 13 Oct (1m, 3f), 14 Oct (1f), 15 Oct (1f), 8 Nov (1m), 9 Nov (1f), and 21 Nov (1f) 2009, V. A. Brou, Jr. (VAB)

*Simplicia cornicalis* is one of the more widespread species of the genus in Asia and the South Pacific, including Hawaii, but absent from New Zealand. The species was previously listed by Poole (1989) under the genus *Nodaria*, so was not included under *Simplicia* in his world catalog. Hampson (1895) already noted the distribution of *S. cornicalis* (as *S. robustalis*) from India to Australia and Hawaii. Kononenko and Pinratana (2005) confirmed its presence (as *S. caeneusalis*) in Thailand and throughout Southeast Asia and southern China. Holloway (1977) noted the species for Norfolk Island. Holloway (1979) also noted the species (as *Nodaria cornicalis*) for the New Caledonia fauna. Lédl (1999) transferred the species to *Simplicia* and Holloway (2008) noted *S. cornicalis* as the senior name for *S. caeneusalis* (Walker) in his Borneo work. Robinson (1975) reported the species (as *S. caeneusalis*) for Fiji, where the synonym *S. lautokiensis* Prout was originally described from. Zimmerman (1958) included the species (as *S. lautokiensis*) for Hawaii, first recorded for Hawaii by Butler (1877). The species likely occurs throughout the South Pacific islands. Clarke (1971) recorded it (as *S. caeneusalis*) on Rapa Island. Tams (1935) noted it (as *S. lautokiensis*) for Samoa. In the Australian catalog, both *Nodaria cornicalis* and *Simplicia caeneusalis* are listed (Edwards, 1996).

The species also occurs in Taiwan (Owada, 1992), and as far north as South Korea (Kononenko and Han, 2007; Kononenko et al., 1998) and southern Japan (Inoue et al., 1982; Owada, 1987; Sugi, 1965). Note that the figures of the male and female genitalia in the Korean noctuid book by Kononenko and Han (2007) is another species, possibly undescribed, not *S. cornicalis* (as *S. caeneusalis*) (Holloway, pers. comm.).

Most species of the *Simplicia cornicalis* group are remarkably similar in adult maculation and often abundant in Southeast Asia, thus genitalic dissection is necessary to verify the species identities. Fig. 2-3 herein show the genitalia of *S. cornicalis* from Florida specimens, which conform to the species as it is known for other regions. The genitalia are also similar among many *Simplicia* species, so careful study is necessary to distinguish the species. It should be noted that in the male genitalia, the small ventral projection by the end of the aedeagus (Fig. 2a), where the vesica begins its expansion, is diagnostic for *S. cornicalis* (Lafontaine, pers. comm.). Males (Fig. 1a) have articulated antennae (central expanded node and basally thickened), while females (Fig. 1b) have normal filiform antennae.

Larvae of *S. cornicalis*, as likely all members of the genus, feed mostly on dead plant tissue and plant debris. In Hawaii, Zimmerman (1958) recorded it on dead leaves of chayote vine (*Sechium edule*, Cucurbitaceae). In Fiji, Robinson (1975) listed the larva on *Metroxylon vitiensis* (Palmae). Chey (2007) recorded the larvae of *S. cornicalis* on rotting seeds of *Duabanga molucana* (Sonneratiaceae) in Borneo (Sahab). Gardner (1946-48) has brief notes on the larval characters (as *S. robustalis*, from India). Palm debris and thatch seems to be the preferred food for *S. cornicalis* larvae, while almost any dried plant material will suffice. Zhang (1994) summarized the recorded hosts for the species (as *S. caeneusalis*) to include *Nypa* (Palmae) thatch, as well as *Albizia* (Leguminosae), and tea.

Only a few economic notes have been published on the species, called the magas fruit-borer in Borneo (Chey, 2007). Corbett and Pagden (1941) reported the thatch damage, where larvae (as *S. caeneusalis*) damaged thatch roofs of huts in Malaysia. Likewise, Swamiappan and Balasubramanian (1979) reported palm thatch heavily damaged by larvae of *S. cornicalis* (as *S. caeneusalis*) in southern India, as well as finding larvae on dried leaves of cotton (*Gossypium*, Malvaceae), and groundnut and *Dalbergia* (Leguminosae).
They also noted the earlier reports of the species (as *S. robustalis*) on dried coconut leaves and thatch of various kinds in India (Ayyar, 1940; Fletcher, 1914), and on dried leaves of *Dalbergia sissoo* (Leguminosae) (Maxwell-Lefroy and Howlett, 1909). Carnegie and Dick (1972) reported larvae also on sugarcane debris. Gope and Goswami (1985) reported in an Indian tea journal that they had reared larvae of *S. cornicalis* (as *S. caeneusalis*) on tea leaves and *Albizia maranguensis* (Leguminosae) in the laboratory, but otherwise found natural occurrence only on thatch and dried leaves of coconut palm (Palmae). Robinson et al. (2001) noted the species (as *S. caeneusalis*) on *Sorghum* (Gramineae); and (as *S. robustalis*) on *Amaranthus* (Amaranthaceae), various grasses (*Eleusine, Oryza, Pennisetum, and Sorghum*, Gramineae), *Cassia fistula* (Leguminosae), *Musa paradisiaca* (Musaceae), and *Camellia* spp. and dry tea leaves (Theaceae), from various sources (Anon., 1923; Fletcher, 1914, 1920; Gardner, 1946-48). For Malaysia, Yunus and Ho (1980) include *Elaeis guineensis*, *Nypa*, and other dry palm leaves as hosts, as well as *Theobroma cacao* (Sterculiaceae), and *Camellia sinensis* (Theaceae).

Although causing damage on dried leaves of various plants in some areas, particularly where thatch still remains important, the species has not been reported in any of the Hawaiian economic entomology literature. Zimmerman (1958) noted that Perkins (1913) had found the larvae on plants imported from Fiji. In 2007, another plant debris-feeder from the South Pacific and Hawaii, *Dryadaula terpsichorella* (Tineidae), was discovered in Florida near naval and air force bases (Heppner and Davis, 2008), after earlier introductions into California near similar military installations with frequent transport to Hawaii. With *S. cornicalis* also in Hawaii and a plant debris-feeder, it is certainly likely that this noctuid may also have gotten into Florida via Hawaii. The status of the introduction in Louisiana is less clear, but may be the result of spread of the moths from Florida.

The records from Louisiana are the most abundant thus far. The resultant flight graph for Abita Springs specimens from 2008-09 is shown below (VAB), indicating possibly only a single autumn generation per year:

![Flights Graph](image)

Being a tropical species and a plant debris-feeder with food available anytime, *S. cornicalis* would likely have continuous generations per year in the tropics, but this remains incompletely verified, although captures in areas like Taiwan include a number of different months during the year (Heppner database, Taiwan Lepidoptera Survey).

With large numbers of palms in Florida and Louisiana, as well as extensive tracts of palmetto, *S. cornicalis* should become abundant before long and possibly throughout the southern United States. The coldhardiness of the species is not known, but it has survived thus far in Gainesville and southern Louisiana where winter frosts are normal. Consequently, it is likely the species will eventually occur northwards at least as far as coastal South Carolina and west to coastal Texas. It could well become a thatch pest in Mexico and Central America once it spreads to there in a few years, which seems highly likely given the rapid movement from Florida to Louisiana in 2-3 years time.
ACKNOWLEDGMENTS

Thanks to Don Lafontaine (Canadian National Collection (CNC), Agriculture Canada, Ottawa, Ontario, Canada) for reviewing the manuscript and adding records of specimens from Archbold Biological Station, collected by J. Vargo, as well as the images of a Florida adult and the genitalia. J. D. Holloway (CABI, London) kindly verified Simplicia genital figures from Asia. E. D. Edwards (CSIRO, Canberra, Australia) helped verify the identity of the Louisiana specimens. Hugo L. Kons, Jr. (HLK) (American Entomological Institute, Gainesville, Florida) kindly provided data on some specimens of S. cornicola he collected recently in Gainesville, Florida. Specimens from Louisiana are in the Brou Collection (VAB), Abita Springs, Louisiana, and CNC. Specimens from Levy County, Florida, are from the Dickel Collection (TSD), Anthony, Florida.

REFERENCES


Fletcher, T. B. 1914. Some South Indian Insects and Other Animals of Importance Considered especially from an Economic Point of View. Madras: Govt. Pr. 565pp.


