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OCCURRENCE OF *EUPYRRHOGLOSSUM SAGRA* AND *PERIGONIA LUSCA* IN FLORIDA (LEPIDOPTERA: SPHINGIDAE)

JEFFREY R. SLOTTEN[1] AND WAYNE MILLER[2]

[1] 5421 NW 69th Lane, Gainesville, Florida 32653
[2] 4639 Weasel Drive, New Port Richey, Florida 34653, USA

ABSTRACT.– *Eupyrrhoglossum sagra* (Poey), newly reported for the mainland United States and Florida, is provided with further observations and photographs on the life history of *E. sagra* (Poey), along with additional information on *Perigonia lusca* (Fabricius).

KEY WORDS: biology, Brazil, Caribbean, Cuba, distribution, egg, habitat, hammocks, hostplants, larva, life history, Mexico, Neotropical, pupa, West Indies.

D'Abrera (1986) listed the range of *Eupyrrhoglossum sagra* (Poey) as Cuba, Mexico to Southern Brazil and Paraguay. Rothschild and Jordan (1903) listed the range as Cuba, and Mexico to Rio Grande do Sul. D'Abrera (1986) also listed the range of the other species of *Eupyrrhoglossum*: *E. venustum* (Rothschild & Jordan) as Peru and *E. corvus* (Boisduval) as Nicaragua to Bolivia. These latter two species have not been reported in the United States thus far. They range much further south than *E. sagra*. Although *E. sagra* has been nearby Florida, in Cuba and the West Indies, it had not been reported for Florida prior to 1995 and especially not as a breeding resident species.

The notes herein provide a further report of the species for the United States and additional biological notes. In working on the life history of the Florida hawkmoth, *Perigonia lusca* (Fabricius), we found the larvae of *E. sagra* on the same hosts as well. Leroy Koehn (now residing in Georgetown, KY) provided the first record of adult *E. sagra* in the United States (Koehn, 1999, 2000). He found them nectaring on *Lantana* sp. (Verbenaceae) during the daytime on Key Largo, Monroe County, Florida. David Fine reported adult *E. sagra* on a building wall on 15 April 2000, in the same vicinity that Leroy Koehn reported adults at flowers (Fine, 2000).

BIOLOGICAL NOTES

The first recorded hostplant record of *Perigonia lusca* in the United States was made by Dickel (1983). Larvae and ova were found on *Ilex krugiana* Loesn. (Aquifoliaceae), commonly known as tawnyberry holly or Krug's holly (Nelson, 1994). J. P. Tuttle (pers. comm.) found *Perigonia lusca* larvae on *Guettarda scabra* (L.) Vent (Rubiaceae), commonly known as rough velvet seed (Scurlock, 1987), in 1995, in Homestead, Dade County, Florida. We visited this same site shortly thereafter and discovered 2nd and 3rd instar larvae of *Perigonia lusca* on *Guettarda scabra* and 3rd and 4th instar larvae of *P. lusca* a few miles away on *Ilex krugiana*. Interestingly, the larvae found on the *Guettarda* would not eat the *Ilex* nor would the *Ilex* feeding larvae feed on the *Guettarda*. Adults of *P. lusca* from these batches of larvae emerged the following year, in January 1996. No apparent differences in the adults reared on the two hosts could be found.

Adults are active at dusk and dawn and are attracted to nectar. Adults have been collected at flowers of *Mirabilis* sp. (Nyctaginaceae), in Monroe County, Florida.

We returned to the site where *P. lusca* was found on *Guettarda* the following year on 4 November 1996 and found four 2nd instar larvae on *Guettarda scabra*. Two larvae looked a bit unusual; their anal horns were somewhat crooked and rough textured. The adults emerged in late December 1996. Two moths were *P. lusca*, but the other two were *Eupyyrhoglossum* sagra, a new United States record. Both species were feeding on the same hostplant at the same time. Subsequent trips made to the same Dade County site produced more ova and larvae of *E. sagra* throughout the year.

We have not found larvae of *E. sagra* past the 3rd instar stage in the wild. All stages, including 5th instars of *P. lusca* that were found on *Guettarda* and placed on *Ilex*, refused to feed on the *Ilex*. *E. sagra* larvae did not feed on the *Ilex krugiana* when offered, even when no *Guettarda* was made available. The larvae would often drop to the bottom of the rearing container and would wander.

The habitat for *E. sagra* and *P. lusca* is tropical hammock and tropical pineland mix (Minno and Minno, 1999). An example of this habitat can be seen in Fig. 1.

LIFE HISTORY NOTES

Rearings consisted of placing ova and early instar larvae in small translucent containers with secure tops. Soon after eclosion, tender foliage was placed in the containers for the young larvae to eat. Third instar larvae were transferred to 5 gallon buckets with hostplant cuttings in dilute sugar water. Netting was placed on the top of the container with a rubber band and a large clear garbage bag was tied over this to keep up the humidity since the rearing took place indoors in an air conditioned room.

Eupyrrhoglossum sagra

Ova

Ova of *E. sagra* are round, green and are laid singly on the undersides of the leaves of *Guettarda scabra* (Fig. 3). They measure 1.5mm in diameter. We found eggs on fresh growth and old growth leaves.

1st Instar

The 1st instar larvae of *E. sagra* are pale green with a dark anal horn, with a hook at the end pointed posteriorly (Fig. 2). The larvae molt at about 10mm in length. Under laboratory conditions, 1st instar larvae stopped feeding after 4 days and shed their skins after 2 additional days.

2nd Instar

The darker green 2nd instar larvae have 7 long diagonal stripes, the first and last more boldly outlined in white. The head is green, anal horn is darker, crooked and upright. The anal horn has a distinctive lighter patch that separates the tip from the basal 2/3 (Fig. 4). The 2nd instar larvae of *E. sagra* reached a length of 15mm in 2 days, stopped feeding and shed the skin in one additional day.

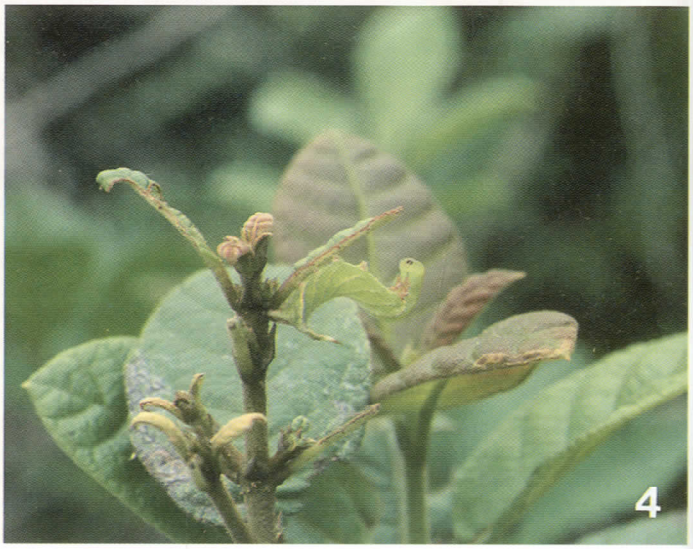

Fig. 1-4. *E. sagra* and *P. lusca*: **1)** Habitat of *E. sagra* and *P. lusca* in Dade County, Florida on 15 Mar 1998. **2)**. Empty ovum shell and the 1st instar larva of *E. sagra*. **3)**. Ovum of *E. sagra* on *Guettarda scabra*. **4)**. Molting 2nd instar *E. sagra* larva.

3rd Instar

The 3rd instar larvae are quite similar in appearance to the 2nd instar larvae (Fig. 5). Third instar larvae reached a length of 22mm in 3 days, stopped feeding and shed their skins in 2 additional days.

4th Instar

The fourth instar larvae of *E. sagra* reached a length of 35mm in 4 days, stopped feeding and shed their skins in one additional day.

5th Instar

The 5th and final instar larvae of *E. sagra* reached a length of 50mm. Fig. 6 shows a final instar larva in defensive pose when disturbed. Fig. 7-8 show the more common green larval form of *E. sagra*. Fig. 9-10 show the less common brown larval form. The anal horn of 5th instar larvae is thicker than in earlier instars and is no longer mottled. The protuberance behind the head is also lost and is replaced by a fold of skin instead. The brown form has the spiracles highlighted in white. A bit of green is retained along the body sides just above the white patches outlining the spiracles. The 4 inner spiracles are especially highlighted.

Pupa

When ready to pupate, the larvae of *E. sagra* drop from the plant and burrow into the soil. When soil is not available, they will wrap themselves in leaves and debris at the bottom of the rearing container in a loose web. Adults emerge in about a month when reared indoors. The pupa of *E. sagra* is seen in Fig. 11-12.

Adult

Pinned reared adults of *E. sagra* are shown in Fig. 13-16. A male is shown mounted dorsal side up in Fig. 14 and the female is shown dorsal side up in Fig. 15. Fig. 15 shows a male ventral side up on the left and the female ventral side up on the right. A live adult resting on a twig is seen in Fig. 17 just after emerging from the soil.

Perigonia lusca

Ova of *P. lusca* are also green and also measure about 1.5mm in diameter; they are laid on the undersides of both fresh and old growth leaves. The larvae of *P. lusca* lack the protuberance in back of the head that *E. sagra* have in the first 4 instars. Instead, the head has a lighter bold stripe outlining it. In contrast to *E. sagra* larvae, the anal horn is straight and is held parallel to the body. The last diagonal stripe is more boldly marked in *P. lusca*. Only one larval color form of *P. lusca* has been found to date in Florida. *P. lusca* larvae retain the characteristics of earlier instars except the head appears more blue green in the last instar. At pupation, *P. lusca* larvae also drop from the hostplant and burrow into the soil.

A 3rd instar larva of *P. lusca* is shown in Fig. 18 and a 5th instar larva is shown in Fig. 19. A newly emerged live adult is shown resting on a twig in Fig. 20.

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Fig. 5-10. *Eupyrrhoglossum sagra*: **5)** 3rd instar *E. sagra* larva on *Guettarda scabra*, with typical leaf damage pattern. **6)** 5th instar *E. sagra* larva in defensive pose. **7)** Green form 5th instar *E. sagra* larva. **8)** Another view of a green form 5th instar *E. sagra* larva. **9)** Brown form 5th instar *E. sagra* larva. **10)** Dorsal view of brown form 5th instar *E. sagra* larva.

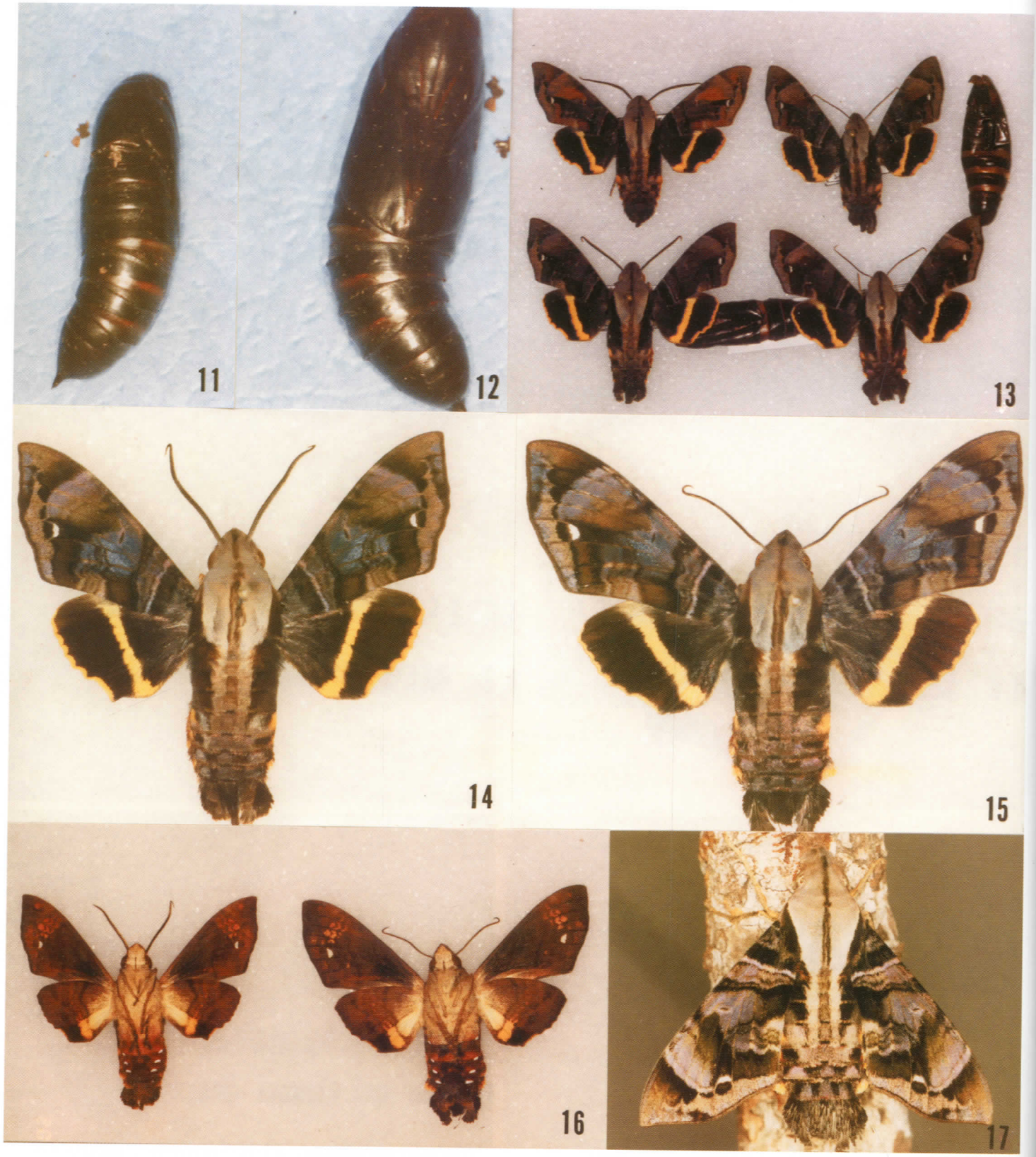

Fig. 11-17. *Eupyrroglossum sagra*: **11-12)** Dorsal and ventral views of *E. sagra* pupa. **13)** adults, dorsal view. **14)** male, dorsal view. **15)** female, dorsal view. **16)** ventral view, male left and female right. **17)** newly emerged adult.

Fig. 18-20. *Perigonia lusca*: **18)** 3rd instar larva on *Guettarda scabra*. **19)** 5th instar larva on *Guettarda scabra*. **20)** newly emerged adult.

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