*Journal of the Lepidopterists' Society*
38(2), 1984, 139

## THE SPHINGID FRENULUM AS A PREDATOR DEFENSE

Sphingidae, because of their large body size, must present a tempting target to vertebrate predators. It has been pointed out how tibial spurs can be used to discourage would-be predators (Allen, 1982, J. Lepid. Soc. 36:155–157), and in this note I suggest an additional defense mechanism.

As with Dr. Allen, my knowledge of this mechanism came through personal contact. In December 1977, I spent three weeks collecting insects in a remote area of western Panama (IRHE camp at Fortuna, Chiriqui Province). Here moths came to light in abundance, and the largest were several species of Sphingidae. Since I did not have killing jars large enough to hold big moths, my collecting method was to grasp these moths by the thorax below the wings and quickly inject several drops of alcohol with a hypodermic needle.

When I collected the largest sphingids (*Coctyius* and *Eumorpha*) in this manner, my fingers were pricked on several occasions by something extremely sharp. On close examination I found that this was caused by the moth's frenulum. Whenever I grasped the moth directly over the wing bases, my fingers would push the forewings up enough to expose the frenulum, and at this point it was perfectly positioned to stab into the tips of my thumb and forefinger. In the case of the *Coctyius* and the *Eumorpha* species at Fortuna, the frenulum was thick and stiff enough to pierce my skin.

The defensive use of the frenulum is, of course, secondary and probably unintentional. Nevertheless, my experience leads me to believe that, at least occasionally, sphinx moths may be able to escape predators when a well placed jab occurs. The frenulum defense would be most effective if a bat, toad or lizard were to seize the moth from the front or from above. Holding the moth by the front of the thorax would leave the predator out of range of the tibial spurs but the struggling moth might be able to stick the frenulum into the lining of the predator's mouth.

R. W. FLOWERS, *Entomology & Structural Pest Control, Florida A&M University, Tallahassee, Florida 32307.*

---

*Journal of the Lepidopterists' Society*
38(2), 1984, 139–141

## ANOTHER LOOK AT SNOUT BUTTERFLIES (LIBYTHEIDAE: *LIBYTHEANA*)

The two species of snout butterflies of the southwestern United States and Mexico, *Libytheana bachmanii* (Kirtland) and *L. carinenta* (Cramer) are commonly confused in spite of treatments by Field (1938, J. Kansas Entomol. Soc. 11:124–133), Michener (1943, Amer. Mus. Novitates No. 1232), Ehrlich and Ehrlich (1961, How to know the butterflies, Wm. C. Brown Co. Publ., Dubuque, Iowa, pp. 174–175), and Heitzman and Heitzman (1972, J. Res. Lepid. 10:284–286). They are easily separated in males by the shape of the eighth abdominal tergite and less easily (especially in females) by the shape and coloration of the wings. Since the adults have been adequately figured, this note serves to illustrate differences in the male eighth abdominal tergites.

Michener figured the eighth abdominal tergite of *L. bachmanii* in dorsal and lateral views but did not provide a figure of *L. carinenta* for comparison. As can be seen in Figs. 1–4 the species differ in the lateral width of the median apical process and number of setae, but more strikingly, in the number of terminal spines. *L. bachmanii* was found to have between 2 and 4 spines (n = 26, mode of 2), while *L. carinenta* has between 6