

THE VERONICELLID SLUGS OF FLORIDA

(GASTROPODA; VERONICELLIDAE)<sup>1</sup>

Jane E. Deisler<sup>2</sup> and Lionel A. Stange<sup>3</sup>

Since the circular on the slugs of Florida (Stange, 1978), additional information on the occurrence of veronicellid slugs in Florida has been gathered. This new information includes the range extension of the Paraguayan slug, Angustipes ameghini (Gambetta) into Orange County (Gillmore, 1982) and the introduction of the Mexican slug, Leidyula moreleti (Crosse and Fischer), into Orange County (Deisler and Phelps, in press). Two additional counties (Alachua and Pinellas) can also be added to the range of the Paraguayan slug based on surveys made in 1984. Nomenclatural changes have been adopted following Thome (1975).

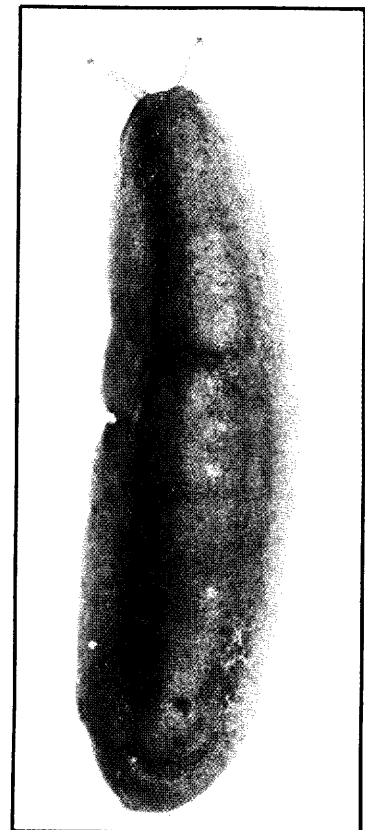
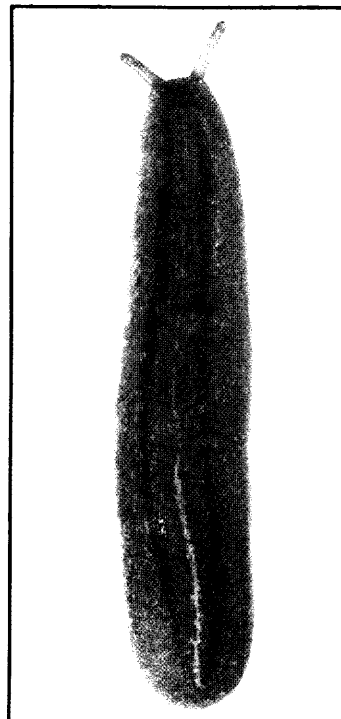
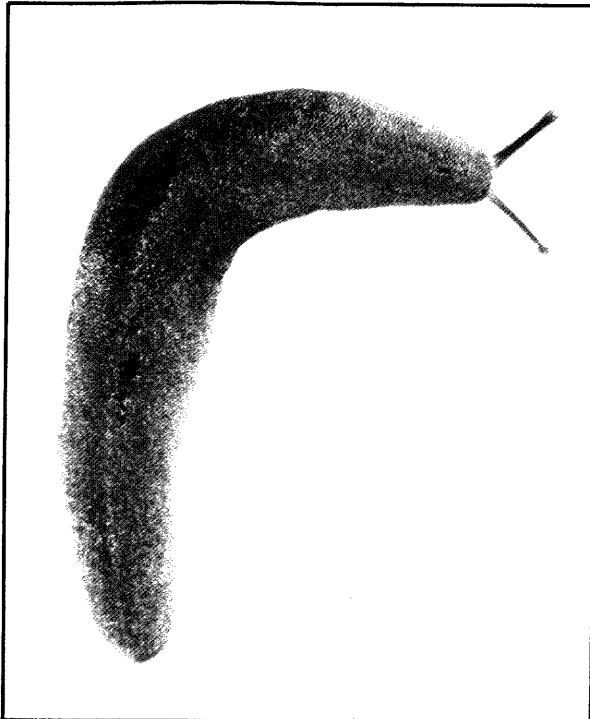


Fig. 1.  
Angustipes ameghini  
(Gambetta)  
(DPI Photo 702920-1)

Fig. 2.  
Leidyula floridana  
(Leidy)  
(DPI Photo 702944-3)

Fig. 3.  
Leidyula moreleti  
(Crosse & Fischer)  
(DPI Photo 702944-9)

<sup>1</sup>/Contribution No. 586, Bureau of Entomology

<sup>2</sup>/Research Associate, Department of Ecology and Evolutionary Biology  
(West), University of Arizona, Tucson, AZ 85721

<sup>3</sup>/Taxonomic Entomologist, Div. Plant Industry, P. O. Box 1269,  
Gainesville, FL 32602

## FAMILY VERONICELLIDAE

This primitive family of slugs is tropical in distribution and possesses several features not found in other slug families. This includes having the eyes on contractile rather than inversible tentacles. In addition, the mantle covers the entire back of the animal and laterally overhangs the narrow foot so that the side walls of the body are hidden. The philomycid slugs have a similar mantle and could be confused with veronicellid slugs. However, differences in breathing pore and anus location can distinguish these two groups of slugs. Philomycid slugs have a breathing pore located anteriorly on the right side of the mantle, and the anus is located anteriorly. In veronicellid slugs no breathing pore is present and the anus is located near the posterior end of the body. The shape of the anus and the flap that covers it offer good generic characters.

Angustipes ameghini (Gambetta).--This slug was originally described from Paraguay and first introduced into the United States (Mobile, AL, and New Orleans, LA) in 1960 (Dundee and Watt, 1961). It is now common in the western panhandle of Florida. Records from other parts of Florida (Dundee, 1974, 1977) were based on interceptions, but in 1982 this slug was found to be well established in Orange County (Gillmore, 1982). Alachua (Newberry) and Pinellas (Palm Harbor) Counties also can now be included based on collections made in 1984. It occurs in greenhouses, nurseries, and grassy fields, where it can be found under boards and potted plants. The slug burrows in soft soil and can enter the root-balls of plants through drainage holes at the base of the containers. To date, few observations on the feeding habits have been made, but Colvin (1962) reported this species eating large amounts of living and decayed leaves. Further, Deisler and Phelps (in press) document feeding on living foliage of Epipremnum aureum (Linden & Andre) Bunt. Further data on biology and distribution can be found in Baker (1925), Dundee et. al (1965), Dundee (1977), and Deisler and Phelps (in press). The slug's velvety black color (fig. 1), which is sometimes interrupted by a pale median stripe, especially in juveniles, and the elongated form of the body provide easy field characters for identification.

Leidyula moreleti (Crosse & Fischer).--This slug is native from Mexico to Nicaragua and has been intercepted at ports in Florida (Burch and Van Devender, 1980). It was first identified from established populations from Orange County in 1983, but a study of the DPI collection revealed specimens collected from Orange County in October, 1981, and from Jupiter, Palm Beach County, in 1980. Leidyula moreleti (fig. 3) superficially resembles the native L. floridana (fig. 2) but can be distinguished normally by the position of the female genital pore (more than 1/4 hyponotal width from foot, fig. 4) and by the usual absence of the dorsomedian light stripe found in L. floridana. This species is phytophagous and has caused damage to cacao plants in Tabasco, Mexico, citrus stock in Orange County, Florida, and has been observed feeding on nursery plants such as E. aureum (Deisler and Phelps, in press). This species is probably the most destructive threat to Florida agriculture of the 3 known Florida veronicellid slugs but has less potential for spread since it is non-burrowing and

is reported to be viviparous (Baker, 1925). Where this slug is established, control measures may be necessary. Records and further data can be obtained from Deisler and Phelps (in press).

Leidyula floridana (Leidy).--This slug is native to the Caribbean (Cuba to Jamaica) and southern Florida. It was first noticed in central Florida in 1968 (Stange, 1978) and records are from as far north as Alachua, Duval, and Jefferson Counties, although the slug is also now found in Louisiana (Dundee, 1977), and Texas (Neck, 1976) suggesting that the species may be even more widespread than available records indicate. It is often found under boards in grassy areas, especially on Stenotaphrum secundatum (Walt.) O. Kuntze (St. Augustine grass). No serious economic damage has been reported thus far from Florida, although some damage to beans and tomatoes has been reported (Stange, 1978). In Orange County all 3 species of slugs were found together under one board, confirming aggregate behavior (Dundee, 1975).

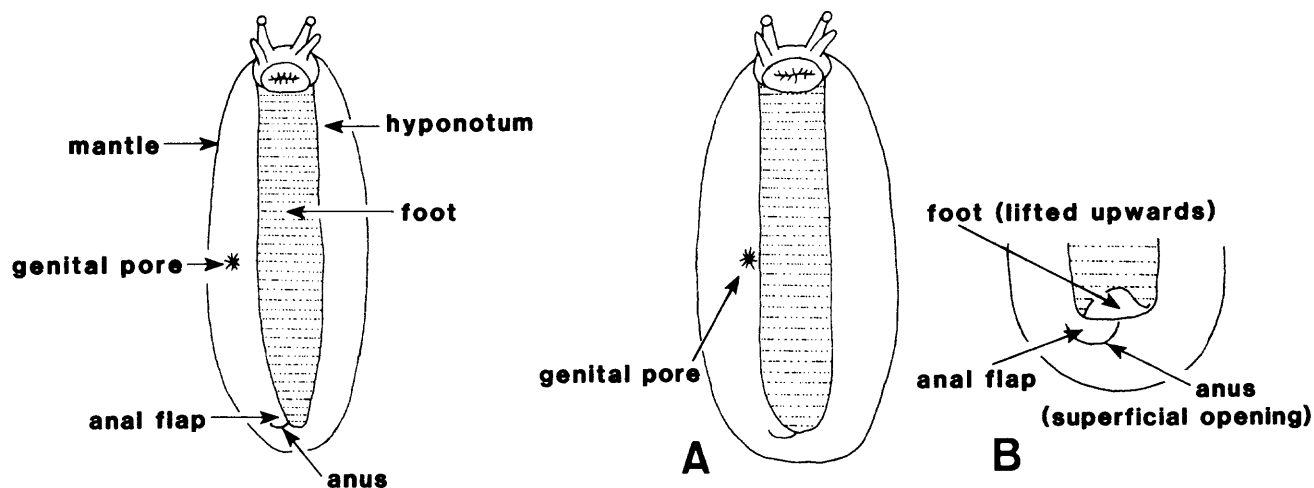


Fig. 4. Leidyula moreletii. Fig. 5. Leidyula floridana.  
 Ventral view. A. Ventral view. B. Anal view.

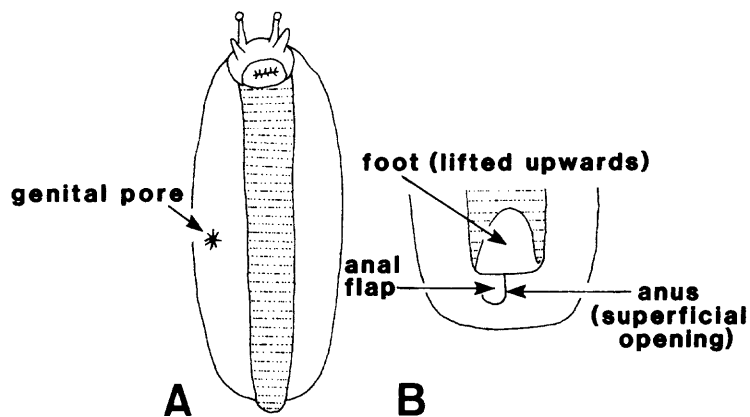


Fig. 6. Angustipes ameghini  
 A. Ventral view. B. Anal view.

KEY TO VERONICELLID SLUGS OF FLORIDA  
(Modified from Burch and Van Devender, 1980)

1. Body velvety black in color; anus roundish and median in position, usually protected ventrally by dextral flap so superficial crescentic slit is longitudinal and normally hidden under end of retracted foot (fig. 6) .....  
..... Angustipes ameghini (Gambetta)

Body brown with irregular dark markings, sometimes with dark bands; anus oval and protected ventrally by anterior flap so that superficial opening is a transverse crescentic slit which usually extends beyond the right edge of the retracted foot (fig. 5b) .....2

2. Female opening usually more than 1/4 hyponotal width from foot (fig. 4); dorsum with tint of dead leaf, more or less dark, with or without dorsomedian dark stripe .....  
..... Leidyula moreleti (Crosse & Fischer)

Female opening usually less than 1/4 hyponotal width from foot (fig. 5a); dorsum is tan, mottled with black, with long median whitish strip ..... Leidyula floridana (Leidy)

REFERENCES

- Baker, H. B. 1925. North American Veronicellidae. Proc. Acad. Nat. Sci. Phila. 77:157-183.
- Burch, J. B., and A. S. Van Devender. 1980. Identification of eastern North American land snails: The Prosobranchia, Opisthobranchia and Pulmonata (Actophila). Walkerana 1(2):33-80.
- Colvin, T. A. 1962. Observations on a slug, Vaginulus sp., in captivity. Louisiana Acad. Sci. 25:122-135.
- Deisler, J. E., and D. Phelps. In Press. The occurrence of the foreign slugs Angustipes ameghini (Gambetta) and Leidyula moreleti (Crosse & Fischer) in central Florida. Malacol. Rev.
- Dundee, D. S. 1974. Catalog of introduced mollusks of eastern North America (north of Mexico). Sterkiana 5:1-37.
- Dundee, D. S. 1977. Observations on the veronicellid slugs of the southern United States. Nautilus 91(3):108-114.
- Dundee, D. S., B. S. Stutts, and P. W. Hermann. 1965. Preliminary survey of a possible molluscan pest in the southern United States. Ecology 46(1&2):192-193.
- Dundee, D. S., M. Tizzard, and M. Traub. 1975. Aggregative behavior in veronicellid slugs. Nautilus 89:69-71.
- Dundee, D. S., and P. Watt. 1961. Louisiana land snails with new records. Nautilus 75(2):79-82.
- Gillmore, R. 1982. On pest detection survey. Plant Industry News, Florida Dept. Agric. & Consumer Services 24(2):8-12, 14.
- Neck, R. W. 1976. Adventive land snails in the Brownsville, Texas area. Southwest. Nat. 21:135-36.
- Peterellis, L. S., and Dundee, D. S. 1969. Veronicella ameghini (Gastropoda): Reproductive, digestive and nervous systems. Trans. Am. Microsc. Soc. 88:547-558.
- Stange, L. A. 1978. The slugs of Florida. Fla. Dept. Agric. Consum. Serv., Div. Plant Ind., Entomol. Circ. 197, 4 p.
- Thome, J. W. 1975. Os generos da Familia Veronicellidae Nas Americas (Mollusca: Gastropoda). Iheringia (Zool.) 48:3-56.