

**THE SUNDEW PLUME MOTH,
BUCKLERIA PARVULUS (BARNES & LINDSEY)
(LEPIDOPTERA: PTEROPHORIDAE)**

BY

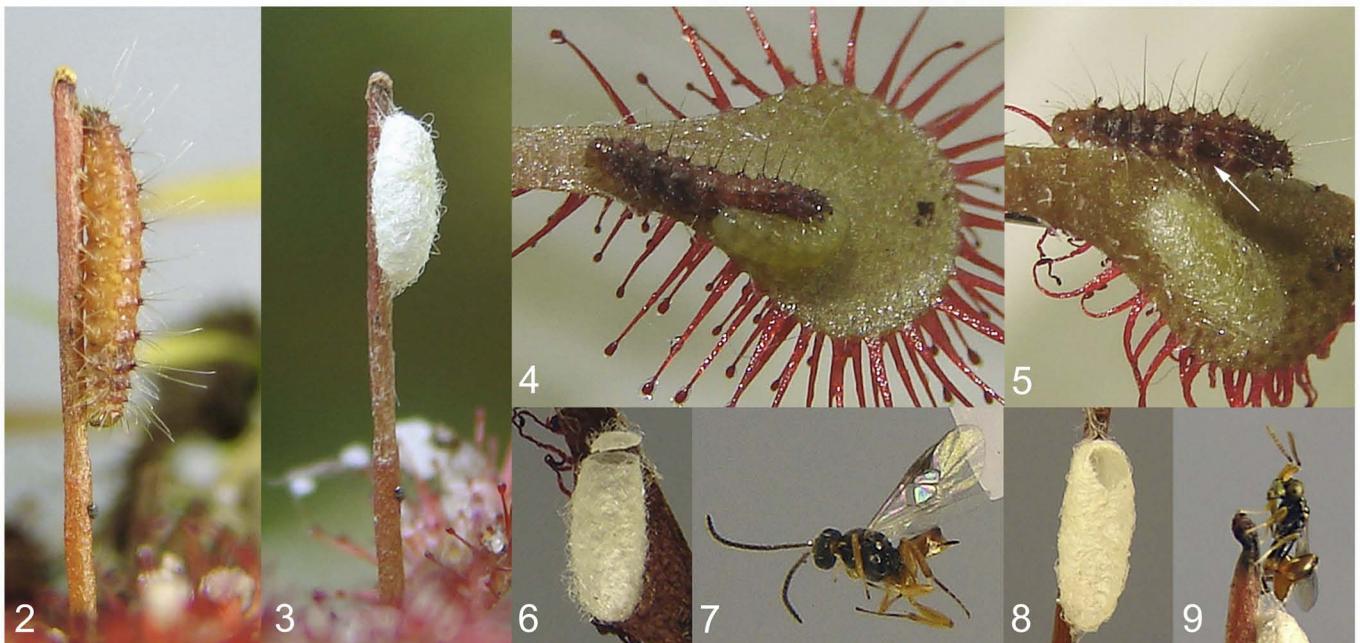
D. L. MATTHEWS

The sundew plume moth, *Buckleria parvulus* (Barnes and Lindsey, 1921) (Fig. 1), is one of the most fascinating plume moths in the southeastern United States because the larva (Fig. 2) feeds on the carnivorous plant genus *Drosera* Linnaeus (Droseraceae). These plants have glandular trichomes that ordinarily trap small insects. Reaching only 8 mm in length, the tiny plume moth larvae feed on the trichomes, first ingesting the sticky fluid at the tips. The larva clears away a patch of these hairs before feeding on the rest of a leaf. Feeding mostly at night, in addition to leaves, larvae will also eat dead insects trapped by the leaves and crawl up the inflorescence stalks to feed on sundew flower buds. Larvae may be found resting on the undersurface of the leaves or on the inflorescence stalks during the day but are usually difficult to spot because their reddish color, especially in younger larvae, blends in with the plants. The larvae, as in related genera, *Dejongia* Gielis and *Megalorhipida* Amsel, have glandular dorsal setae with swollen tips that exude a sticky secretion. Larval and pupal morphology and chaetotaxy of these genera as well as *Buckleria* Tutt and other Nearctic pterophorids are described in detail by Matthews (2006).



Figure 1. *Buckleria parvulus* adult male. Florida: Franklin Co. Apalachicola N.F. vic. Hickory Landing FR 101 18.viii.1991 D. Matthews & T.A. Lott ex. larva on lvs. of *Drosera filiformis*.

While successfully avoiding the peril of the sundew's sticky traps, larvae frequently fall prey to a species of *Cotesia* wasp (Braconidae) (Fig. 7). A single wasp larva emerges from the final instar of the pterophorid larva



Figures 2-9. *Buckleria parvulus* larvae and parasitoids: 2) Parasitized final instar larva of *B. parvulus* on sundew inflorescence stalk; 3) cocoon of *Cotesia* wasp from same individual; 4) *Cotesia* larva (greenish) after emerging from pterophorid larva (red); 5) same individuals 23 minutes later showing nearly complete parasitoid cocoon and pterophorid larva with exit wound (arrow) from emerging parasitoid; 6) cocoon after emergence of *Cotesia* wasp showing "escape hatch" exit; 7) *Cotesia* sp. (Braconidae); 8) *Cotesia* cocoon after emergence of chalcid wasp hyperparasite; 9) chalcid wasp.

and immediately spins its cocoon (Figs. 4, 5), leaving the pterophorid crawling around for hours before it finally expires. In contrast to the moth larvae, the white cocoons of the parasitoid larvae (Figs. 3, 6, 8) are easily spotted on the *Drosera* leaves or inflorescences, and persist long after the wasp emerges after a pupal stage of about 6 days. Several spent cocoons may be found on a single plant. In some populations more than half the pterophorid larvae are parasitized. The braconid wasp emerges by chewing a circular "escape hatch" at one end of the cocoon (Fig. 6). Cocoons found with holes off to one side (Fig. 8) are the result of a hyperparasite, a chalcid wasp (Fig. 9) which feeds on the braconid.



Figures 10-11. *Buckleria parvulus*: **10**) pupa on inflorescence stalk 12 hours before emergence; **11**) newly emerged adult of the same individual perching on pupal skin (note a larva can be seen hiding under the leaf on the right).

The plume moth larvae that manage to avoid the wasps pupate on the inflorescence stalks or on nearby blades of grass and in this particular genus, are always positioned with the head facing down (Fig. 10). The pupa is light green, changing to yellowish-tan and brown before emerging after up to 11 days. The newly emerged moth clings to the pupal skin while the wings, at first drooping at an angle, expand and are held fully erect, perpendicular to the body (Fig. 11). Adults have a wingspan of 8.5 to 11.5 mm. Adult *Buckleria* can be distinguished from *Megalorhipida* and *Dejongia* by the absence of the dark scale tooth in the hindwing third lobe (see Matthews 2008).

Buckleria parvulus was described from a single female collected in Vernon parish Louisiana (Barnes & Lindsey, 1921). It has also been recorded from Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Texas. While *Drosera* occurs in most of the country (Schnell 2003; USDA plants, <http://plants.usda.gov/>), the actual county records for both moth and host (Fig. 12) have a corresponding coastal plain and Mississippi embayment distribution. The distribution also extends into South Florida, with a population even present on Big Pine Key as evidenced by preserved flight trap samples (D.H. Habeck collection). The hostplants grow in damp areas of pine flatwoods, bogs, lake shores, seasonal ponds, and drainage ditches with nutrient poor soil. The most common host, the tiny round-leaved sundew, *Drosera brevifolia* Pursh, occurs over most of the range but the moth also uses the thread-leaved sundews, *Drosera filiformis* Rafinesque, varieties *filiformis* and *tracyi* Diels in

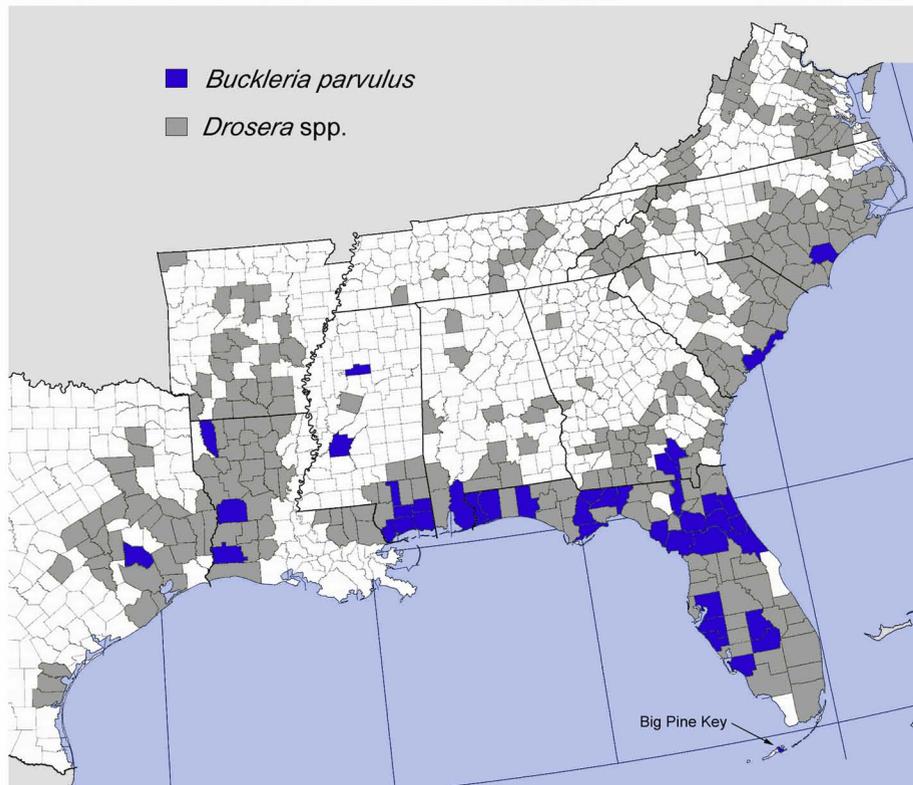


Figure 12. Distribution of *Buckleria parvulus* (blue) and hostplants *Drosera*, spp. (gray) in the southeastern United States. Hostplant county records according to data available on the USDA plants website.

the Florida panhandle, Mississippi and Alabama.

The life history of the European sundew moth, *Buckleria paludum* (Zeller), well known for just over a century, was first reported by Chapman (1906). The European species is double brooded. The second instar larvae of the fall generation tend to feed near the central heart of the plants and overwinter in cocoons. The life history of *B. parvulus* in Florida was studied in the 1960s by Eisner at Archbold Biological Station (Eisner & Sheppard 1965, Eisner 1967, 2003) and by Matthews (1989) in North Florida. In Florida, larvae have been collected from May to October and distinct broods are not apparent. The plants tend to die off through the winter and in many cases sporadically disappear with changing water levels and drying seasonal ponds.

It is not known how the moth populations overwinter or survive dry cycles.

In addition to *B. parvulus* from the Nearctic Region and *B. paludum* from the Palearctic and Oriental Regions, there are four other *Buckleria* species worldwide: *B. girardi* Gibeaux, *B. madecassea* Gibeaux, and *B. vanderwolfi* Gielis, from the Ethiopian Region, and *B. brasilia* Gielis from the Neotropical Region (Gielis 2003, 2008).

There is much more to be learned about the life history, phenology, and distribution of these tiny moths. I encourage our readers to look for these moths and send in records to our state coordinators for inclusion in the *News*.

Acknowledgments

I thank Terry A. Lott and Judy Gillmore for assistance in the field, and Dale H. Habeck for support during graduate studies. Terry A. Lott and Jacqueline Y. Miller provided helpful comments on the text.

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**GLUTOPHRISSA DRUSILLA TENUIS (LAMAS, 1981)
IN DICKENS COUNTY, TEXAS**

BY

J. BARRY LOMBARDINI



Florida White (*Glutophrissa drusilla tenuis*).

This female Florida White (*Appias drusilla tenuis*) was captured while nectaring on Lantana at Dickens County Springs Park, Texas, on 17-VII-2008. The Florida White frequently visits coastal Texas and it is known to stray as far as Nebraska and Colorado thus it is not greatly unusual to be this far north. However, I believe that this may be a record for Dickens County, Texas. My thanks to Charles Bordelon for determining the subspecies. Charles also mentioned in our correspondence that "...in the US, you generally don't see this form in TX. It is a migratory phase."

REPORTS OF STATE COORDINATORS

Alabama: C. Howard Grisham, 573 Ohatchee Road, Huntsville, AL 35811, E-Mail: chgrisham@Comcast.net

Arkansas: Mack Shotts, 514 W. Main Street, Paragould, AR 72450, E-Mail: cshotts@grnco.net

Mack sends in the following two reports from David Rupe. Lycaenidae: *Callophrys irus hadros* - worn, tattered male; Texarkana near Sugar Hill Road, Miller County, AR, 7- April 2009; *Celastrina ladon*, 10 - Feb. - 2009, Nola, Scott County, AR.

Florida: Charles V. Covell Jr., 207 NE 9th Ave, Gainesville, FL 32601, E-Mail: covell@louisville.edu

Charlie sends the following report from Florida:

With three major freeze episodes in early 2009, butterflies have been more scarce than in the previous four years. Below are first dates of record in my Gainesville, FL, yard for 15 butterfly species. By comparison, by May 17,