

A NEW SPECIES OF *LAPARA* (SPHINGIDAE) FROM SOUTHEASTERN UNITED STATES

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ABSTRACT. *Lapara phaeobrachycerous*, new species, is described and illustrated. The new species presently is known to occur in extreme eastern Louisiana and the state of Mississippi in the southeastern United States. The species can be distinguished from *Lapara coniferarum* (J. E. Smith) by its slightly smaller size, darker color, the presence of a single postcellular dash, narrower wings, shorter antennae, and different flight period.

Additional key words: endemism, hawkmoths, Louisiana, voltinism.

Hodges (1971) recorded two species of *Lapara* in North America north of Mexico: *Lapara bombycoides* Walker and *Lapara coniferarum* (J. E. Smith). He treated *Lapara halicarnie* (Strecker) as a synonym of *L. coniferarum*, and *Lapara pinea* Lintner as a synonym of *L. bombycoides*. In his review of *Lapara*, Riotte (1972) recognized *L. halicarnie* as distinct on the basis of features of the labial palpus, pretarsus structure, color, size, maculation, genitalia, and larvae. Riotte also questioned the synonymy of *L. pinea* with *L. bombycoides*. Previous authors (e.g., Holland 1903, Clark 1919), also noted or discussed the problems associated with the "hypertrophied" type specimen of *L. halicarnie*.

At the time of Riotte's (1972) review, no *Lapara* species were known from west of the Mississippi River in the United States, and none was known to occur in Louisiana. Riotte examined 241 examples of *L. coniferarum* from 13 states, mostly bordering the east and Gulf coast, from New York and Rhode Island southward to Florida and westward to Mississippi. He also examined 649 examples of *L. bombycoides* from a much greater range, 48 examples of *L. halicarnie* from four southeastern states, and the type of *L. pinea* from New York.

Since 1972, 8422 specimens of *Lapara* from Louisiana have been collected by the author using ultraviolet light traps. Most of the better quality specimens are pinned, spread, and labeled, and are in the author's collection. From 1972 through 1985, 1946 specimens were collected and recorded as *L. coniferarum*. From 1986 through 1992, specimens were segregated into two phenotypes. During these seven years, 6473 *Lapara* specimens were collected: 2247 (35%) are *L. phaeobrachycerous*, new species, and 4226 (65%) are *L. coniferarum*.

Lapara phaeobrachycerous Brou, new species

(Figs. 1A & B)

Male. Head: Dark charcoal gray to occasional brownish gray in color, scales on front and vertex form a bluntly rounded area between an-

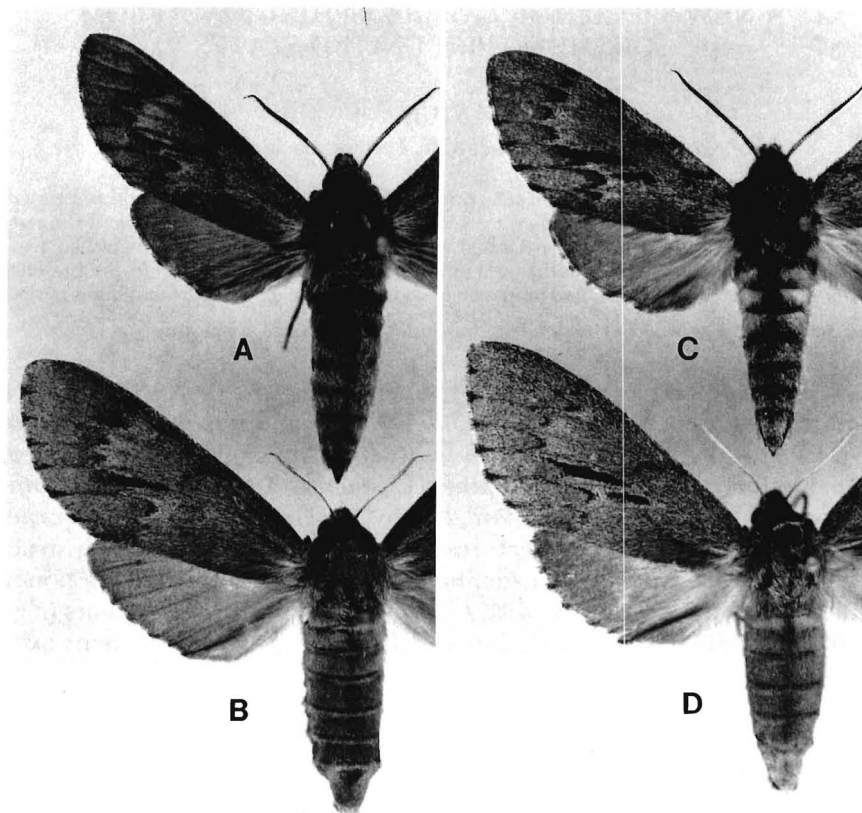


FIG. 1. The *Lapara* of Louisiana: *L. phaeobrachycerous*, A. male holotype, B. female allotype. *L. coniferarum*, C. male, D. female. Specimens pictured were collected at Louisiana, St. Tammany Parish, 6.8 km NE Abita Springs.

tennae. Antennae laminate, biciliate, weakly hooked tip, length \bar{x} = 10.3 mm (9.0–12.0; n = 40). Thorax: Color above as described for head, below a slightly lighter shade. Forewing: Dorsal color charcoal gray, whitish scales mostly limited to area basad along curving postmedial line, usually one prominent postcellular dash, though a second dash to varying degrees of prominence is not uncommon. Ventral color usually lighter shade than above, unremarkable without bands or maculation, length \bar{x} = 27.35 mm (25–31.5; n = 40). Hindwing: Unicolorous charcoal gray dorsally without whitish scales or maculation. Ventral surface as described for forewing. Genitalia: (n = 12) Valve generally oval, process of sacculus variable, narrow to broad projection, either acuminate, dentate, or combination of both, uncus apex mildly hooked (Fig. 2A).

Female. Head: As described for male. Antennae simple, length \bar{x} =

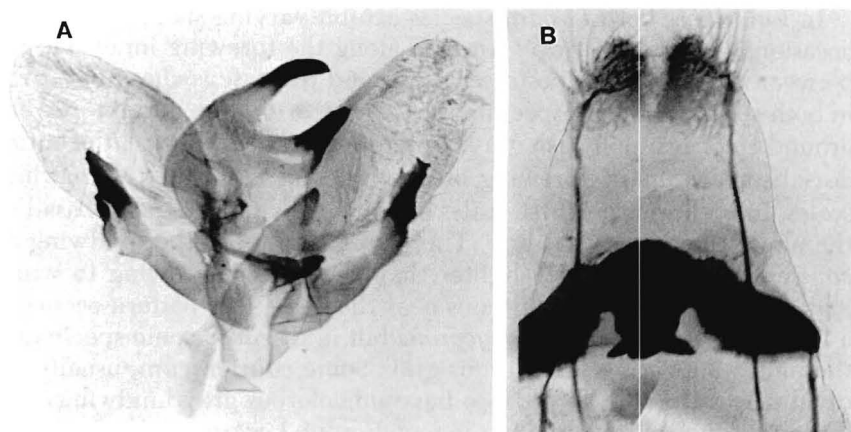


FIG. 2. Genitalia of *L. phaeobrachycerous*, Louisiana, St. Tammany Parish, A. male, B. female.

10.6 mm (10.0–12.0; $n = 18$). Thorax: As described for male. Forewing: Dorsal and ventral color as described for male, length $\bar{x} = 31.6$ mm (29.5–35.5; $n = 14$). Hindwing: Dorsal and ventral color as described for male. Genitalia: ($n = 4$) Sclerotized genital plate, rounded center convexity along distal edge. Entire structure unremarkable otherwise (Fig. 2B).

Types. Holotype ♂ (Fig. 1A), USA, Louisiana, St. Tammany Parish, 4.2 miles (6.8 km) NE Abita Springs, sec. 24T6SR12E, 9 Sept. 1991. Allotype ♀ (Fig. 1B), same locality, 19 Sept. 1991. Paratypes: 879 ♂ and 18 ♀, same locality, April 1 to Oct. 23, 1983–92. Holotype and allotype deposited in U.S. National Museum of Natural History. Paratypes deposited in Florida State Collection of Arthropods, Gainesville, Louisiana State University, Baton Rouge, and the author's collection.

Diagnosis. In contrast to *L. phaeobrachycerous*, scales on the front and vertex of the head of *L. coniferarum* form an acute distal projection between the antennae and lower margin of the frons, among Louisiana and Mississippi specimens.

Maculation is variable within populations, especially among different broods. In Louisiana, individuals of the first brood of *L. coniferarum* are larger than those of subsequent broods, a trait seen in other Louisiana Sphingidae such as *Isoparce cupressi* (Bdv.). The first brood of *L. coniferarum* also exhibits the greatest variation in color and shade. Specimens can be very dark, or have a predominance of brown scales especially on the forewings. It is not uncommon for darker specimens to exhibit a range of very dark gray to off-white or even near white hindwings.

In Louisiana, both *Lapara* species exhibit varying shades of gray or occasionally brownish gray. An area along the forewing inner margin between the transverse postmedial line and the base is chestnut brown in both species. In fresh specimens of *coniferarum*, the dorsal forewing ground color is usually ash gray. Unlike *phaeobrachycerous*, the entire dorsal surface of the forewing of *coniferarum* is suffused with white scales. In both species, these scales are especially concentrated basad of the along the postmedial line. The upper surface of the hindwing of *coniferarum* is noticeably lighter than the forewing, owing to white scales, which are more numerous near the base. This pattern occurs to a lesser degree in *phaeobrachycerous* but is absent in some specimens, the moths appearing unicolorous gray. Some *coniferarum*, usually individuals of the first brood, also have unicolorous gray hindwings.

Among the sparse forewing maculation of *Larara* are bold to faint black streaks occurring as a furcating transverse postmedial line, especially on the veins between the postmedial line and the outer margin. These black vein lines flare out as they approach and include the fringe near each vein. The fringe between each vein is usually white in *coniferarum* and white to off-white in *phaeobrachycerous*.

The forewing maculation of both species includes a faint to bold median line, which arises from the chestnut-colored area along the inner margin and proceeds towards the apex. The upper one-third of this line abruptly turns inwardly and intersects the costal margin at varying angles, acutely to near perpendicular. In *phaeobrachycerous*, this line often intersects the costal margin more basad than seen in *coniferarum*. The sometimes faint antemedial line roughly parallels the median line.

Riotte (1972) noted that female *L. coniferarum* have less accentuated markings than males. Markings of both Louisiana species similarly exhibit less accentuated markings. The forewing postcellular dashes vary in number in both Louisiana species. In *coniferarum* there are usually two dashes, though one or three occur in varying degrees of prominence and with less frequency. Visually, males of the two species are easy to distinguish. Male *phaeobrachycerous* appear as darker, slightly smaller, short and narrow-winged specimens with short antennae. The antennae of male *coniferarum* in Louisiana average 29% longer, $\bar{x} = 13.3$ mm (11.5–14.5; $n = 40$), than in *phaeobrachycerous*. Differences in both wing length and antennae length of *coniferarum* and *phaeobrachycerous* are statistically significant as defined by *t*-test (highest level $\alpha = 0.0005$). In males of *coniferarum*, the antennae cilia are twice the length of those on *phaeobrachycerous*, while the shaft diameter is roughly equivalent in both species.

In Louisiana, the average forewing lengths for *coniferarum* are:

males \bar{x} = 29.25 mm (27.5–31.5; n = 40), females \bar{x} = 31.1 mm (29.5–35.0; n = 23). Riotte (1972) listed measurements for *coniferarum* as males 24–30 mm (n = 40), females 27–36 mm (n = 8), with no averages given. For *L. halicarnie*, Riotte listed forewing lengths as males 29–36 mm (n = 13), females 32–40 mm (n = 6).

The genitalia of *L. coniferarum* have been illustrated by Rothschild and Jordan (1903), Hodges (1971), and Riotte (1972). Both Riotte and Hodges discuss the variability of certain structures of the male genitalia, and Riotte illustrates the variation in the sacculus. Comparing female specimens from Louisiana, the distal edge of the lamella postvaginalis of *L. coniferarum* is gently rounded, without the degree of convex protrusion noted in *L. phaeobrachycerous*. This genital plate attribute does vary slightly over *L. coniferarum*'s vast range.

Distribution. Despite extensive collecting throughout Louisiana, *L. coniferarum* has been taken only in six upper, southeastern parishes, all east of the Mississippi River: West Feliciana, East Feliciana, East Baton Rouge, Ascension, Tangipahoa, and St. Tammany. This region of the state is known as the Florida Parishes.

I have studied hundreds of *Lapara* specimens from Mississippi to Florida, and upwards along the east coast states to Pennsylvania. From Georgia and South Carolina, specimens exist along with *coniferarum* which appear assignable to neither *coniferarum* nor *bombycoides*. They appear as small, narrow-winged specimens, like *phaeobrachycerous*, and may account for prior literature records indicating *bombycoides* occurring south to Florida. Due to limited material, it is unclear if these specimens have a relationship to *phaeobrachycerous*, though I suspect they are indeed *phaeobrachycerous*. All specimens examined from the area around Clemson, South Carolina, were melanic (very dark charcoal gray to near black) narrow-winged small specimens with short antennae.

The verified range of *L. phaeobrachycerous* includes only the states of Louisiana and Mississippi at present. Besides the type locality, specimens have been collected at Fluker, Tangipahoa Parish, Louisiana, and from Harrison, Pike, and Lee counties in Mississippi.

Etymology. The specific epithet is derived from the Greek *phaeo*, meaning dark, dusky, and *brachycerous*, meaning short horns or antennae.

DISCUSSION

Lapara is a difficult genus for several reasons. Most field collected specimens are worn because the moths have a tendency to flutter along the ground through brush and leaf litter for considerable distances, especially when they approach light traps operating within a few feet of ground level. This problem appears to be reduced by operating traps

at a greater height above ground, for example, above five meters. Females comprised less than one percent of the total *Lapara* specimens collected. Apparently, females are not attracted to ultraviolet light to the degree males are.

In Louisiana, flight periods of *L. coniferarum* are different from those of *L. phaeobrachycerous*, though both species have five annual broods. Based on dates of capture over a seven-year period (1986–92), *L. coniferarum* has its initial annual brood peaking mid-April, with specimens beginning to appear in mid-March, and on occasion even as early as late February. The initial brood peak is separated from the second brood peak by an approximately two-month interval. Brood peaks two through four begin around mid-June and occur at 30-day intervals. In contrast, *L. phaeobrachycerous* has its first brood peak about mid-May, though the numbers of individuals of this brood are usually quite low compared to subsequent broods. All five broods occur at 30-day intervals.

Koebele (1881) stated that *L. coniferarum* has at least two annual broods in the southern United States. Riotte (1972) also stated *coniferarum* has two distinct flight periods in the southeastern coastal states. Those authors apparently did not recognize that their second brood/flight period involved multiple sequentially occurring broods.

Based on specimens collected at ultraviolet light traps, the nightly flight time for male *coniferarum* in Louisiana begins about midnight and lasts for approximately three to four hours, while females have appeared only at dusk. No flight time information is known about *phaeobrachycerous*.

Nothing is known about the immature stages of *phaeobrachycerous*, but I suspect that the larvae may feed on *Pinus* species. The area in which this new species occurs in Louisiana is classified as a longleaf pine region.

Specimens fade quite rapidly. Pinned specimens several years old appear brown, quite different in color than freshly collected specimens. This is due in part to ultraviolet degradation as well as the effects of chlorine gas from vaporizing insect pest fumigants in storage cases (Brou 1991). Descriptions of colors and other attributes are representative of those occurring on freshly collected and dried Louisiana specimens, unless stated otherwise. Clark (1919) commented that the type of *L. halicarnie* in Strecker's collection appears faded.

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