

PLUME MOTHS (LEPIDOPTERA: PTEROPHORIDAE) IN LOUISIANA BY

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Plume moths from the Louisiana Lepidoptera Survey (LLS, Abita Springs, LA) were recently identified. These 363 specimens, together with about 114 specimens from various institutions and more than 110 online photo vouchers, serve as the basis for parish records and a summary of the state fauna to date. Prior to assembling these records, about 10 species were known from the state (Matthews 2006), including the *Baccharis* Borer, *Hellinsia balanotes*, reported by Palmer (1987), *Sphenarches anisodactylus* reported by Landry (1990), and the Sundew Plume Moth, *Buckleria parvulus*, described from the female holotype from Vernon Parish by Barnes and Lindsey (1921). We report months of capture/observation along with a list and parish maps, and discuss species pairs or groups which cannot be identified based on images alone. The fauna is compared with that of the neighboring state of Mississippi, previously reported in the *Southern Lepidopterists' News* by Matthews (2010). Notes on larval hosts and habitats at ongoing survey sites are included along with sample images (Figs. 1–6) from photography - based surveys. Images for identification of reported species are available on the Moth Photographers Group Website (<http://mothphotographersgroup.msstate.edu/>) as well as other websites mentioned below.

Materials and Methods

Specimens from the LLS (1972 to present) were identified and determination and unique identifier barcode labels added: all are catalogued in the first author's research database. Genitalic dissections (n=36) necessary for identification were placed in glycerin microvials mounted on the same pin with the specimen. On the accompanying maps, records were combined and plotted as center-of-parish dots. Additional records from previously-identified Louisiana material in museum collections (Mississippi Entomological Museum, MEM; Florida State Collection of Arthropods, FSCA; National Museum of Natural History, USNM) and photo vouchers were included. Photo vouchers are from surveys by the authors (RT in Caddo Parish and CMA in Vernon Parish) as well as submissions by numerous contributors to BugGuide (<https://bugguide.net/>) and iNaturalist (<https://www.inaturalist.org/>). A query of the Global Biodiversity Information Facility [GBIF.org (10th August 2018), GBIF Occurrence Download, <https://doi.org/10.15468/dl.0pad3l>] yielded additional specimen and photo voucher records. Only photo

vouchers for species for which dissection is not necessary for identification were counted. Specimen data from LLC will be made available to GBIF.

Primary Survey Sites

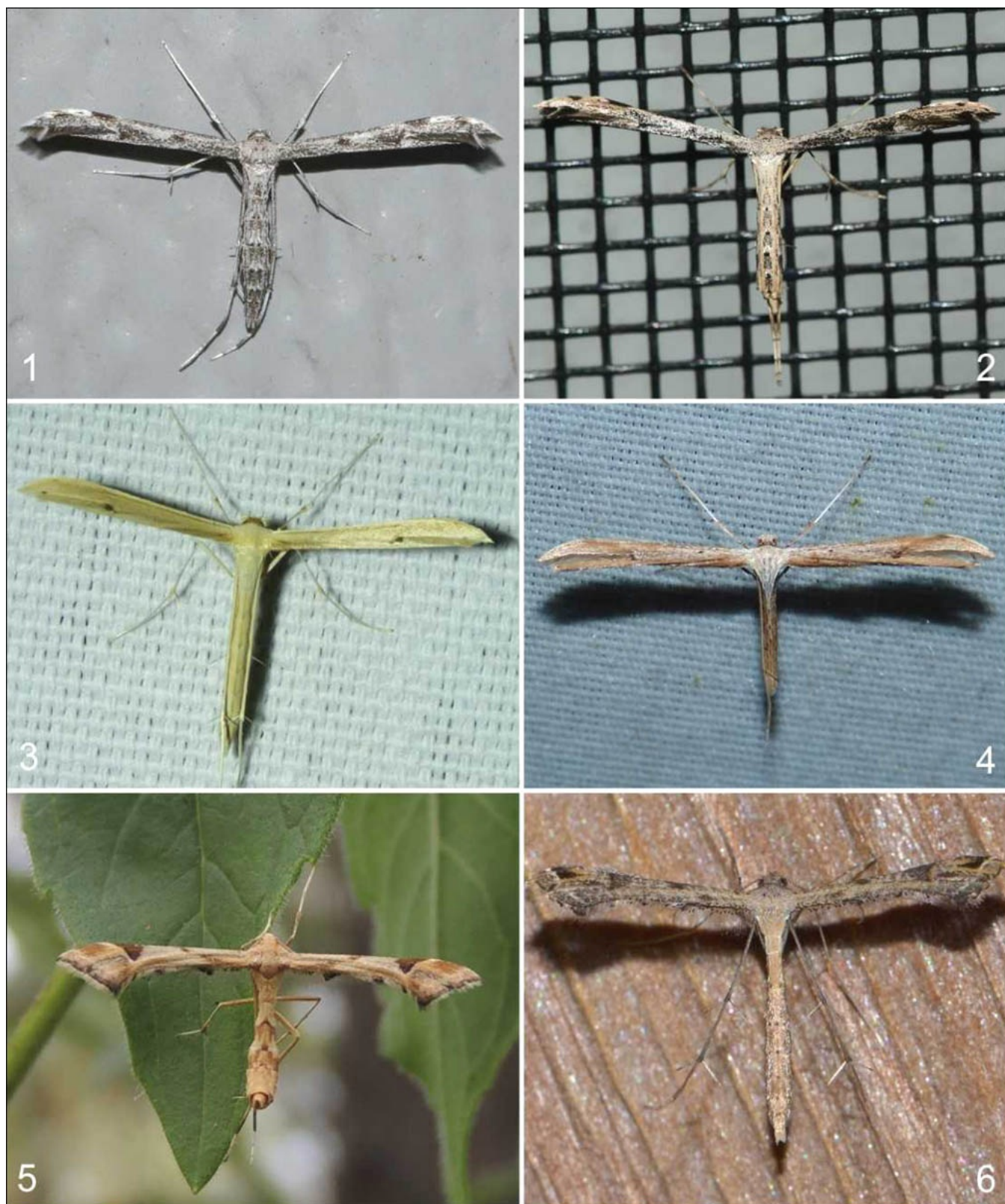
While we include records from throughout the state in our summary (Table 1), the majority of records are from four ongoing survey sites:

1) Edgard, St. John the Baptist Parish (1969-1984): This location, originally a German emigrant settlement, is adjacent to the Mississippi River in a long-established farming community of sugar cane plantations, and has been the home property of the Brou family for about seven generations.

2) Near Abita Springs, St. Tammany Parish (1982-present): This is the home of Vernon and Charlotte Brou for the past 36 years, a rural area consisting primarily of, and dominated by, longleaf pine forests, and also commercial timber production, with occasional pitcher plant bogs and horse and cattle farms. Nearly a century ago, this area was noted for tung oil tree plantations and large scale farming of indigo. At both locations, a number of automatically operating ultraviolet light traps with collection chambers were continuously operated from dusk until dawn every night of every year (1969 to present), regardless of temperature or weather conditions. Collecting of pterophorids by the LLS consisted only of minimal haphazard bycatch, as they were not the targeted insects of this light trapping effort.

3) Royal Hills Farm, Caddo Parish, ca. 6 miles east of Vivian: This site includes a tree farm covering approximately a quarter section (153 acres). It has ca. 120 acres of thinned pine uplands, predominantly sandy loam soils, and some upland hardwoods near a homesite. Predominant tree species include loblolly and shortleaf pine, post oak, black oak, red maple, and sweetgum. There are ca. 25 acres of creek bottom, with bald cypress, water oak, southern red oak, white oak, and various other species. The remaining acreage includes various pipeline clearings, woods roads, and other openings.

4) Allen Acres, a privately owned 26-acre tract in southeastern Vernon Parish: This site was formerly longleaf pine dominated but now has limited longleaf with many loblolly pines. It is adjacent to the



Figs. 1-6. Some Louisiana plume moths: 1) *Hellinsia inquinatus*, 31 March 2008, Vivian, LA, photo by Royal Tyler; 2) *Adaina ambrosiae*, 22 September 2018, photo by Royal Tyler; 3) a *Hellinsia* stem borer, Pitkin, LA, photo by Charles M. Allen; 4) *Emmelina monodactyla*, Pitkin, LA, photo by Charles M. Allen; 5) *Platyptilia carduidactylus*, 14 June 2013, Vivian, LA, photo by Royal Tyler; 6) *Stenoptilodes taprobanes* or *brevipennis*, 13 September 2017, Vivian, LA, photo by Royal Tyler.

Kisatchie National Forest, other private lands, and timber-growing companies. The western boundary is about 200 meters from Ouiska Chitto Creek. Ten

mercury vapor lights with sheets have been checked and moths photographed nightly for the past three years.

Results

Twenty-seven species were identified from LLS specimens. Two additional species (*Geina tenuidactylus* and *Stenoptilia zophodactylus*) are known from single specimens from MEM. In addition, an undated photo voucher for *Lantanophaga pusillidactylus* from Ascension Parish brings the total number of species recorded for the state to 30. A list of species, including numbers of pinned specimens, image vouchers, and months of occurrence, is presented in Table 1.

As reported for Mississippi (Matthews 2010), *Pselnophorus belfragei* is the most commonly encountered species. In Louisiana, it accounts for at least 19% of combined collections/observations. *Adaina ambrosiae* is the second most commonly encountered species (13%), followed by *Hellinsia inquinatus* and *Hellinsia balanotes*. The latter species

is greatest in size, with wingspans up to 42 mm, and is perhaps more easily noticed by collectors and photographers.

Given the relatively small sample size for each species, we are unable to plot the actual extent of adult flight periods. The months of occurrence (Table 1) do, however, reflect multiple or continuous flights for at least 10 species. Five species are likely restricted to single flights (*Paraplatyptilia auriga*, *Geina buscki*, *G. tenuidactylus*, *G. sheppardi*, *H. elliottii*) in spring or early summer. Others, such as *Stenoptilia zophodactylus* and *Adaina bipunctatus*, are rarely encountered throughout their ranges and are only known from single months. No distinct distribution patterns are noted, but records reflect more overall sampling in the southeastern part of the state.

Table 1. List of Pterophoridae species recorded from Louisiana.

	Species	# pinned specimens	# image vouchers	# parishes	months recorded
1.	<i>Lioptilodes albistriolatus</i> (Zeller, 1871)	29	8	11	-FMAM-JA-OND
2.	<i>Platyptilia carduidactylus</i> (Riley, 1869)	3	3	4	--M-MJ-A-O--
3.	<i>Lantanophaga pusillidactylus</i> (Walker, 1864)		1	1	-----
4.	<i>Anstenoptilia marmarodactyla</i> (Dyar [1903])	1	1	2	JF-----
5.	<i>Stenoptilodes brevipennis</i> (Zeller, 1874)	6		3	-----ON-
6.	<i>Stenoptilodes taprobanes</i> (Felder & Rogenhofer, 1875)	15		6	J-A-J-ASON-
7.	<i>Stenoptilia zophodactylus</i> (Duponchel, 1838)	1		1	----M-----
8.	<i>Stenoptilia pallistriga</i> Barnes & McDunnough, 1930	11		2	JF-M----OND
9.	<i>Paraplatyptilia auriga</i> (Barnes & Lindsey, 1921)	2		1	--MA-----
10.	<i>Capperia</i> sp.	6	1	3	---AMJJA---
11.	<i>Geina buscki</i> (McDunnough, 1933)	11		5	---AMJ-----
12.	<i>Geina tenuidactylus</i> (Fitch, 1854)	1		1	----M-----
13.	<i>Geina sheppardi</i> B. Landry, 1989	5		1	---AM-----
14.	<i>Sphenarches anisodactylus</i> (Walker, 1864)	19	7	8	-----JASON-
15.	<i>Buckleria parvulus</i> (Barnes & Lindsey, 1921)	7	2	3	--M-M-J-SO-D
16.	<i>Exelastis pumilio</i> (Zeller, 1873)	30	4	4	----MJJASO--
17.	<i>Exelastis montischristi</i> (Walsingham, 1897)	21		2	----M-JASO--
18.	<i>Pselnophorus belfragei</i> (Fish, 1881)	67	38	12	--MAMJJASON-
19.	<i>Emmelina monodactyla</i> (Linnaeus, 1758)	19	14	7	JFMAMJ-SOND
20.	<i>Hellinsia elliottii</i> (Fernald, 1893)	9		1	----MJ-----
21.	<i>Hellinsia paleaceus</i> (Zeller, 1873)	20		4	-FMAMJJAS---
22.	<i>Hellinsia inquinatus</i> (Zeller, 1873)	42	12	8	--MAMJJASO--
23.	<i>Hellinsia balanotes</i> (Meyrick, 1908)	42	7	11	J-MAMJJ-SOND
24.	<i>Hellinsia kelicottii</i> (Fish, 1881)	6		4	-FMAM-----
25.	<i>Hellinsia chlorias</i> (Meyrick, 1908)	12		4	---AM-AS---
26.	<i>Hellinsia glenni</i> (Cashatt, 1972)	6		2	---AM-J-----
27.	<i>Hellinsia unicolor</i> (Barnes & McDunnough, 1913)	18	3	7	--MAMJJA----
28.	<i>Adaina simplicius</i> (Grossbeck, 1917)	11		4	-----ASO--
29.	<i>Adaina bipunctatus</i> (Möschler, 1890)	1		1	-F-----
30.	<i>Adaina ambrosiae</i> (Murtfeldt, 1880)	56	17	9	--MAMJJASOND

Discussion

While we include records based on photo vouchers, it is important to note that, of the 30 species recorded, 10 cannot be identified based on images alone. These include look - alike species pairs and the *Hellinsia* stem borer complex. This difficulty is something to be taken into serious consideration when using image-based biodiversity data to address broader research questions.

Of the larval stem borers, *Hellinsia balanotes* can usually be recognized by its larger size if a reference scale is included. *Hellinsia kellicottii*, *H. chlorias*, *H. glenni*, and *H. lacteodactylus* all require genitalic dissections for identification. *Hellinsia paleaceus*, an external feeder on *Vernonia* as larvae, though not closely related, is easily confused with the stem borers in photos. The hindwings are slightly darker than the forewings but in images of live specimens, the hindwing is rarely visible.

Look-alike species pairs requiring genitalic dissection include *Stenoptilodes brevipennis* vs. *S. taprobanes*; *Geina tenuidactylus* vs. *G. buscki*; *Adaina simplicius* vs. *A. bipunctatus*, and *Hellinsia elliottii* vs. *H. homodactylus*. The last species has not yet been authoritatively identified from Louisiana or Mississippi but occurs as far south as northern Georgia and westward into Kansas. Several images from Louisiana have been identified by various online contributors as *H. homodactylus*. These most likely refer to *H. elliottii* but the possibility still exists for *H. homodactylus*, an external feeder on *Solidago*, to occur in the state. In the case of *Adaina simplicius* vs. *A. bipunctatus*, the majority of specimens encountered are *A. simplicius*. Along with being relatively rare, the life history of *A. bipunctatus* is unknown. *Adaina simplicius* is a flower borer which is common in the fall in association with the flowering time of several composite hosts. Our record of *A. bipunctatus* comes from one dissected female from Edgard, St. John the Baptist Parish.

The Louisiana fauna is very similar to that of Mississippi, with the latter more completely known and including 32 species. Species recorded in Mississippi but not yet in Louisiana are: *Paraplatyptilia carolina* (Kearfott), *Oxyptilus delawaricus* Zeller, *Geina periscelidactylus* (Fitch), *Oidaematophorus eupatorii* (Fernald), *Hellinsia citrites* (Meyrick), and *Hellinsia lacteodactylus* (Chambers). Of these, the most likely to be encountered in Louisiana are *O. eupatorii* and *H. lacteodactylus*, which occur in the southern half of Mississippi as well as Florida. Species reported from Louisiana but not yet from Mississippi are: *Anstenoptilia marmarodactyla*, *Lantanophaga pusillidactylus*, and *Exelastis montischristi*. The first, *A. marmarodactyla*, is common in the western USA and a sporadic pest

introduced with ornamental sage plants (*Salvia* spp.) (Matthews and Watkins 2011). *Lantanophaga pusillidactylus*, a tropical and subtropical species, occurs in Florida and is spread with ornamental plantings of *Lantana*. The last species, *E. montischristi*, occurs in tropical and subtropical areas, including the Gulf Coastal Plain where the larval host, *Rhynchosia minima*, grows.

Larval host plants are known for all of the species we report from Louisiana (Matthews and Lott 2005), except for *Adaina bipunctatus*, *Geina buscki*, and *Capperia* sp. *Adaina bipunctatus*, like its 'twin', *A. simplicius*, probably feeds within the flower heads of a composite. *Geina buscki* has been reported on blackberry (*Rubus*) as in its 'twin' *G. tenuidactylus*, but no reared specimens have been found in museum collections. *Capperia* sp., a Gulf Coast resident, is possibly associated with *Scutellaria* or other mints and will be treated further in a separate publication.

Our knowledge of the Louisiana plume moth fauna is far from complete. However, with the present list and accompanying parish maps, we hope to inspire collectors and photographers alike to fill in the missing parishes with their records. We also encourage photographers doing inventories to consider collecting samples of species requiring dissection to accompany their photographic vouchers.

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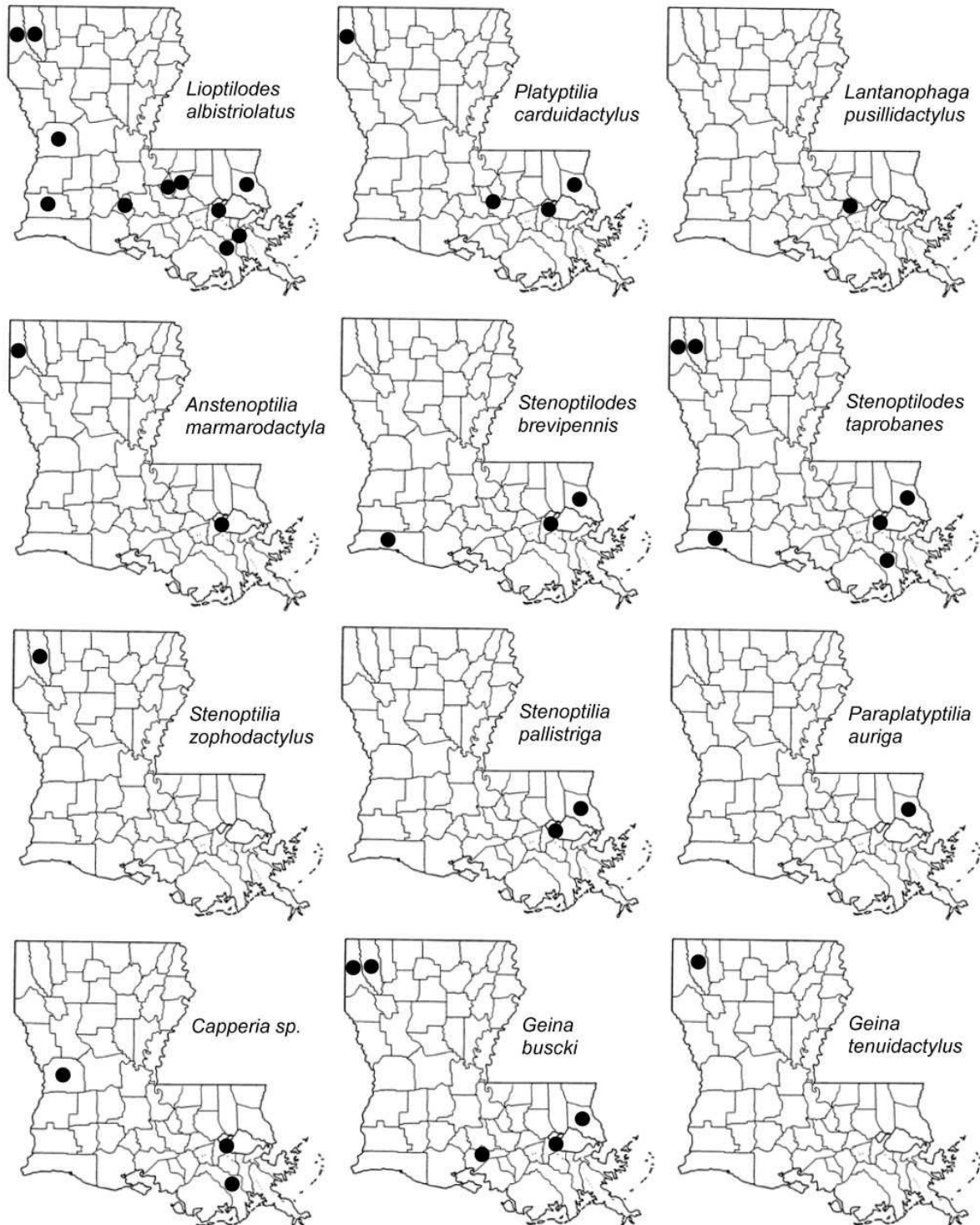
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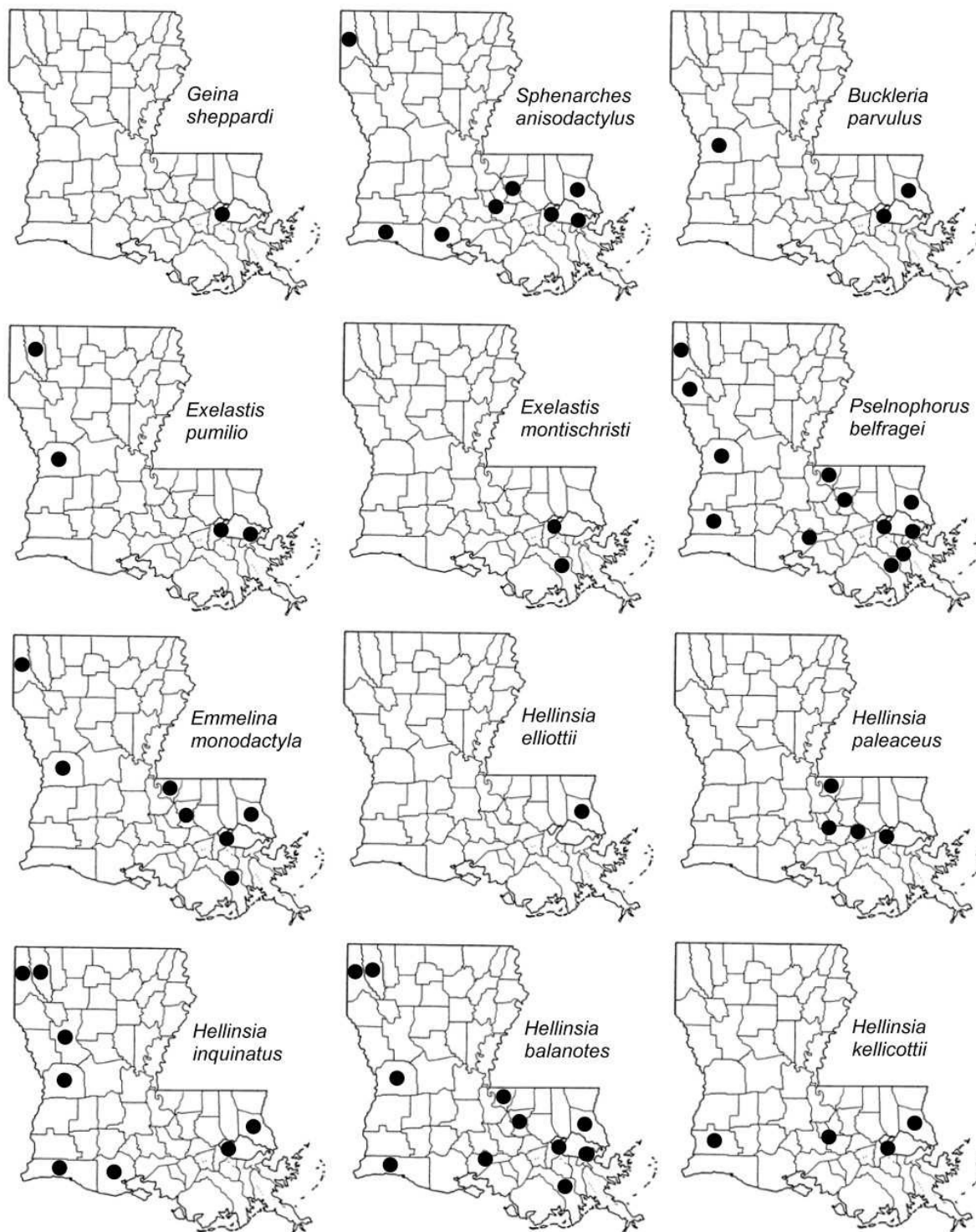
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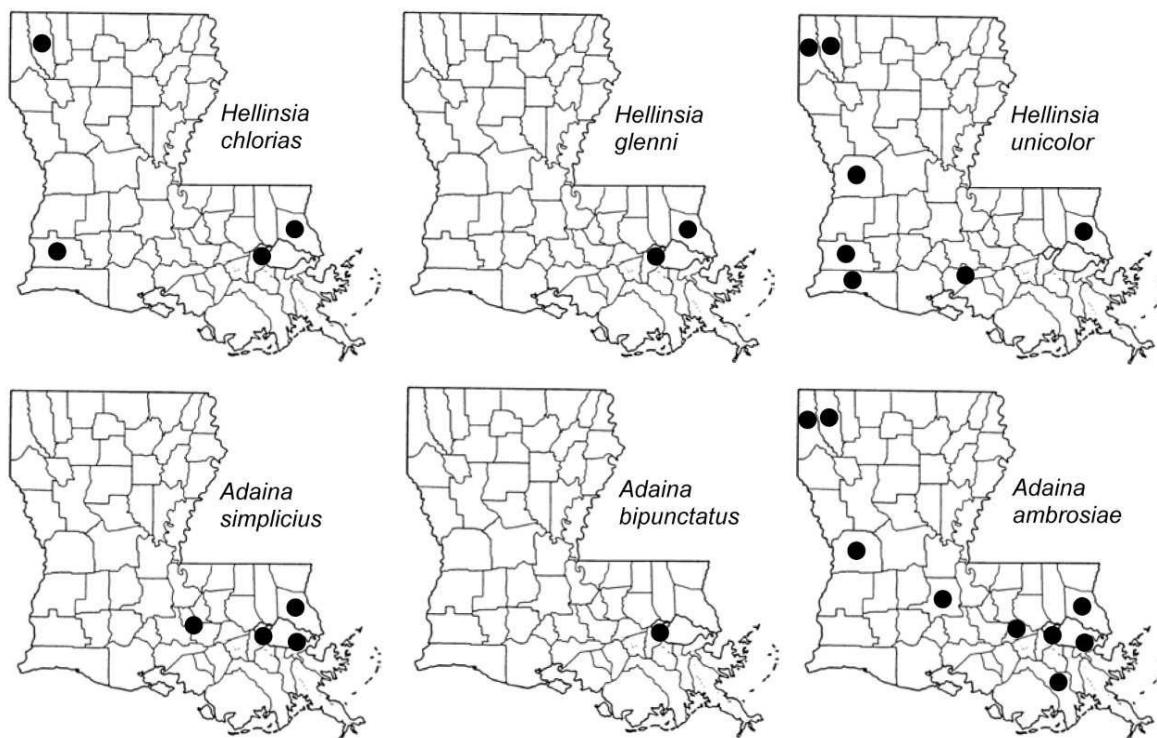
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Parish records for Louisiana Pterophoridae



Parish records for Louisiana Pterophoridae



Parish records for Louisiana Pterophoridae

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