A LEPIDOPTERA BIODIVERSITY BLITZ AT THE OTTER SLOUGH CONSERVATION AREA (STODDARD COUNTY, MISSOURI)

BY

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ABSTRACT

We conducted a Lepidoptera biodiversity blitz on 3 and 4 June 2018 at the Otter Slough Conservation Area in Stoddard County, Missouri. We documented as many Lepidoptera species as possible with MV/UV lights, rotten banana/brown sugar bait, and diurnal collecting with nets. We present records for 235 species, including 193 Macrolepidoptera and 19 Rhopalocera [3]. Habitats sampled include hydric hardwood forest, cypress swamp, open wetlands, and field. Examples of some species are shown on 15 color plates of live photos and pinned specimens

INTRODUCTION

The Otter Slough Conservation Area is a 4,866 acre area including hydric hardwood forest (Figure 2:B, E-H), cypress-tupelo swamp (Figure 2:A), open marsh with cattails, sedge meadow, and cypress (Figure 2:D), mowed field (Figure 2:C (middle)), and slough habitats. It is managed by the Missouri Department of Conservation, primarily for waterfowl (MDC 2021). The cypress-tupelo swamp is one of the few examples remaining in Missouri (MDC 2021). This area occurs within the narrow northward extension of the Lower Austral Life Zone along the Mississippi River Valley.

For over a decade we have been working on a genetic survey of *Catocala* (Lepidoptera: Noctuidae) with the 5' region of the mitochondrial gene cytochrome oxidase subunit I (COI 5'). When collecting fresh material of *Catocala* for DNA sequencing, we have also conducted Lepidoptera biodiversity blitz surveys for the habitats where we sampled for *Catocala*. Examples of these biodiversity blitzes include Kons and Borth (2006, 2007b, 2009, 2012), Kons et al. (2017), and numerous on-line check lists available at http://www.lepidopterabiodiversity.com/checklists.htm.

In Kons and Borth (2015b) we reported that the *Catocala crataegi* complex forms two allopatric genetic sister clades, a nominotypical northern clade, and a more variable southern clade with phenotypes that have been confused with *Catocala pretiosa*, the recently described *Catocala aestivalia*, and other species. At the time of this publication we had only sampled this southern clade from eastern Texas and Mississippi. In 1985 George Balogh visited Otter Slough and collected 12 specimens of what appeared to be the southern clade of the *Catocala crataegi* complex, representing the most northerly locality that we are aware of for these phenotypes. Recent material was needed for DNA sequencing.

From 3-4 June 2018 we visited the Otter Slough Conservation Area to sample *Catocala* and document as many other co-occurring Lepidoptera species as possible. This paper reports the Macrolepidoptera and Rhopalocera species recorded during this survey. This research was conducted under Wildlife Collectors Permit #17910 issued by the Missouri Department of Conservation.

MATERIALS AND METHODS

Lepidoptera were sampled with a 400 watt MV illuminated sheet, 175 watt MV light trap, 15 watt UV light traps, a bait trail and bait traps baited with rotten bananas and brown sugar, and by netting individuals during the day. Specific locations of sampling stations for each survey date are presented in Table 1 and Figure 1, and these survey methods are described in detail in Kons and Borth (2007a). One or both of us walked the bait trail regularly throughout the night, and lights were run all night. Diurnal survey was limited to one or two hours each day.

All unique species records (one or more individuals of a species recorded from a specific survey station on a specific date) are documented by at least one collected voucher specimen. However, all bait traps were collectively considered a single survey station, and most individuals found in the bait traps were the same species found on the bait trail and were released.

Photographs in the plates were taken with a Cannon Powershot SX60 HS camera except for *Idia denticulalis* and *Dysgonia telma*. Some of the individuals in the photographs of live specimens were collected and the identifications were made from the specimens.

Genitalia dissections were performed by HLK to identify some species. Genitalic preparations are stored in vials of 99% IsOH and not slide mounted, as described in Kons and Borth (2015a). Species with dissected voucher specimens include: *Pyrgus communis* (Hesperiidae); *Xanthotype sospeta, Nemoria bistriaria*,

and *Nemoria elfa* (Geometridae); *Virbia opella, Bleptina sangamonia, Dysgonia telma, Catocala crataegi* complex, *Leuconycta lepidula, Apamea cariosa,* and *Leucania linda* (Noctuidae).

RESULTS

A check list of 235 Lepidoptera species recorded during the bioblitz is presented in Table 2, along with all of the unique species records for Macrolepidoptera and Rhopalocera. The list includes 193 Macrolepidoptera species and 19 Rhopalocera species. Table 2 also includes all microlepidoptera species recorded in the families Attevidae, Sesiidae, Cossidae, and Limacodidae, plus a few representatives of Gracillaridae, Tortricidae, and Pyralidae. Hodges et al. (1983) checklist numbers accompany each species, which serve as a citation for year and author of description.

Some of the Lepidoptera species recorded are shown as live photos or pinned specimens in Figures 3-14 and 16-18. Figure 15 shows a few examples of other insects encountered.

DISCUSSION

Species Potentially Near The Limit Of Their Inland Range (Excluding the Atlantic Coastal Plain): Species recorded that are primarily or exclusively residents within the Lower Austral Life Zone include: *Macaria aequiferaria, Iridopsis pergracilis*, and *Nemoria elfa* (Geometridae); *Isoparce cupressi* (Sphingidae); *Zanclognatha obscuripennis* complex*, Redectis pygmaea, Dyspyralis ocala* complex*, Schrankia macula, Dysgonia telma, Cutina distincta, Catocala crataegi* complex (southern clade), *Pseudeustrotia indeterminata*, and *Xanthopastis regnatrix* (Noctuidae). At Otter Slough these species are likely near the northern limit of their permanent range, and in Missouri likely have a limited distribution in the Mississippi River valley. We have also surveyed the northern terminus of the Lower Austral Zone in the Ohio River Valley of southern Indiana (Posey County), and most of these species have been recorded there as well (Kons and Borth 2012), although these surveys were conducted in late summer, outside of the flight season of the *Catocala crataegi* complex (southern clade).

We recorded some species potentially near the southern limit of their permanent range (at low elevations), that to our knowledge barely enter the Lower Austral Zone. These species include *Clostera albosigma* (Notodontidae), *Haploa lecontei, Zanclognatha ochreipennis, Phalaenostola eumelusalis, Spargaloma sexpunctata, Calyptra canadensis, Leuconycta lepidula, Leuconycta diptheroides, Pseudeustrotia carneola, Apamea cariosa, Resapamea passer, Oligia modica, Xylomoia chagnoni, Dypterigea rozmani*, and *Lacinipolia renigera* (Noctuidae). Note that some of these species do occur at latitudes south of Otter Slough with higher elevations and climates cooler than the Lower Austral Zone.

Strays or Ephemeral Migrants: Southern strays and ephemeral migrants are most likely to be found later in the season; however, several species were found during out bioblitz, including single individuals of *Xylophanes tersa* (Sphingidae), *Pseudoplusia includens, Condica confederata, Callopistria floridensis*, and *Agrotis malefida* (Noctuidae).

Habitat Dependency: Kons and Borth (2006) reported that the majority of Macrolepidoptera species found at any individual locality analyzed were widespread generalists. This analysis was based upon north Florida, but we have found the same holds true all over the eastern U.S. Most of the Macrolepidoptera species we found at Otter Slough are widespread generalists that occur in many habitat types, and some others are widespread in habitats with hardwood forest. Fifteen species are potentially restricted to a more particular type of habitat, either hydric hardwood forest, cypress wetlands, or open wetlands. *Acontia delecta* is probably a habitat specialist as well, but we know too little about it to associate it with a particular habitat type. Hypothesized habitat association is included in the species accounts (below). A summary of the habitat specialists recorded during our bioblitz follows.

Species recorded during our bioblitz that are dependent or likely dependent on cypress wetlands include *Macaria aequiferaria, Iridopsis pergracilis, Nemoria elfa, Isoparce cupressi*, and *Cutina distincta*. Farther north we also recorded all of these species from the cypress swamp at Twin Swamps in Posey County, Indiana, in addition to other cypress swamp specialists (Kons and Borth 2012). These additional species were recorded from mid August to early September. We suspect conducting surveys at Otter Slough at other times of year would expand the list of cypress wetland specialists. Species recorded that are likely dependent on open or open-shrubby wetlands include *Nycteola metaspilella, Globia oblonga*, and *Resapamea passer*.

Species recorded during our bioblitz that are likely dependent on hydric hardwood forest include *Timandra amaturaria, Melanomma auricinctaria, Ledaea perditalis, Dysgonia telma, Catocala crataegi* complex (southern clade), *Pseudeustrotia indeterminata*, and *Xanthopastis regnatrix*. The Otter Slough populations of most other Lepidoptera species present likely depend on the hydric hardwood forest at the Otter Slough Conservation Area, but other populations of these species occur in a variety of other habitat types at other localities.

We don't consider any species we recorded from Otter Slough to be reasonable candidates for listing as threatened or endangered, either regionally or throughout their range. While the species restricted to the Lower Austral Zone are expected to have a limited distribution in Missouri, this is incidental to the way the political boundary is drawn (only a small portion of the political unit of Missouri includes the Lower Austral Zone). However, Otter Slough is a particularly valuable area for Lepidoptera conservation from a biogeographical standpoint, as it appears to include many species near the northern or southern limits of their range. It also has a diverse assemblage of wetland obligate Lepidoptera species.

Bait Trail: During our bioblitz bait attracted thousands of Lepidoptera individuals and 81 different species. There were less Lepidoptera individuals on the bait trail on the second night, because the portion of trees swarmed by carpenter ants increased substantially. Trees with many carpenter ants tended to have far fewer moths than trees with only scattered carpenter ants. Numbers or estimated numbers found at bait for individual species are provided in the species accounts (below).

Predators: A number of predators were observed or photographed feeding on Lepidoptera individuals that were attracted to the bait applied to tree trunks (Figure 14). Numerous spiders and frogs were positioned at the edge of bait applied to a tree trunk, waiting to ambush insects that come to feed on the bait. We have noted this phenomenon at numerous sites where we put out bait from the Canadian to Lower Austral Zones in the eastern U.S., as well as in south central and southwestern states where scorpions also exhibit this behavior. Predators will come to the edge of the bait even under conditions where bait is attracting few or no insects.

To our knowledge the frogs feeding on insects on the baited trees were all *Hyla cinerea*, one example of which is shown in Figure 14. These frogs were observed consuming *Idia americalis, Idia lubricalis, Renia* species, and *Pseudeustrotia carenola*. Another frog species, *Lithobates utricularia*, was feeding on beetles and cockroaches that came to bait which had spilled onto leaf litter on the ground.

The predominate spider predator on the bait trail was a species we tentatively identify as *Dolomedes tenebrosus* (Pisauridae). Dozens of these spiders were observed with Lepidoptera prey, but most of the Lepidoptera were unidentifiable when we saw the spiders with them. Exceptions are *Pseudaletia unipuncta* and *Paralleia bistriaris* (Figure 14). These spiders were also feeding on *Parcoblatta* cockroaches, which came to feed on the bait in the hundreds.

Swarms of black carpenter ants (*Camponotus pennsylvanicus*) came to feed on the bait applied to many tree trunks. However, in some cases these ants also preyed upon moths that came to feed on the bait. In most cases the moths we saw as ant prey were no longer recognizable; however, we documented these ants preying on *Cutina distincta* (Figure 14). We observed the ants attack moths on numerous occasions, but most of the time the moths flew away unharmed.

Accounts For Selected Species: This section includes notes on abundance at bait, other field observations, a discussion of habitat association based on our field work, and interesting distributional records. A detailed analysis of habitat dependency for many Macrolepidoptera species that occur in the southeastern USA is presented in Kons and Borth (2006). While that analysis was based on northern Florida, the results appear to be broadly applicable throughout the Lower Austral Life Zone, as our surveys in east Texas, western Louisiana, southern Indiana, and southeastern Missouri have revealed that habitat associations in these areas are comparable to northern Florida.

GEOMETRIDAE (Figures 3 & 16): Most species recorded during our bioblitz are widespread habitat generalists that came exclusively to lights. Exceptions are covered below.

***Mellila xanthometata* (Figure 3):** This species was fairly common around the MV lights. The larval host is *Gleditsia;* hydric hardwood forest populations are associated with *Gleditsia aquatica*, whereas upland populations are associated with *Gleditsia tricanthos*. This species is usually found where *Gleditsia* occurs in the Upper and Lower Austral Zones, and often co-occurs with *Spiloloma lunilunea* and *Catocala minuta* which have the same larval hosts.

***Macaria aequiferaria* (Figure 3):** Numerous individuals landed on the vegetation and wooden platform around the MV light on 3 June. We suspect this is a cypress feeder as discussed in Kons et al. (2017). It is among the most common and widespread of the cypress feeders. It is still common at the northern terminus of the inland range of cypress in Posey County, Indiana (Kons & Borth 2012).

***Digrammia* sp. (*ordinata*?) (Figure 3):** One specimen of a phenotype closely resembling *Digrammia ordinata* was taken in the UV trap on 4 June. *Digrammia ordinata* would not be expected at Otter Slough as the larval host is *Amorpha canescens*, which grows in upland prairie sites, but this species is the closest match in our collections.

***Iridopsis pergracilis* (Figure 3):** This species was found at four of our light traps. The larval host is cypress (Zhang 1994), but this species is more localized and less common than *Macaria aequiferaria*. We also found it at the northern terminus of the inland cypress range in Posey County, Indiana (Kons and Borth 2012).

***Prochoerodes lineola* (Figure 3):** This is one of two species of Geometridae that came to bait during our bioblitz, although many of the other species recorded have come to bait during other surveys. Nine individuals came to bait and a few came to lights. This is a common and widespread habitat generalist.

***Nemoria elfa* (Figure 16):** A few specimens were found on the MV sheets. We suspect this is a cypress feeder and a species complex, as discussed in Kons et. al (2017), but only one of the two possible species occurs in the northern Lower Austral Zone to our knowledge; the other occurs sympatrically in the Gulf region. Specimens from Otter Slough and Posey County, Indiana are the white-fringed phenotype.

***Cyclophora nanaria* (Figure 3):** One specimen was found at the MV light on 3 June. This species is common and widespread in the Lower Sonoran Zone from central Texas and westward, but we have only occasionally encountered it in the Lower Austral Zone (northern Florida and eastern Texas). This species is migratory, and is an ephemeral migrant as far north as Outagamie County, WI. We are uncertain if the Otter Slough specimen is a migrant or resident species.

***Haematopis grataria*:** Six individuals were found at lights during our bioblitz. This is a common and widespread species in the Transition and Upper Austral Zones, but in the Lower Austral Zone resident populations may be limited to the northern part. We have found isolated strays of single specimens in northern Florida and eastern Texas, but never found multiple individuals in one locality in the Gulf region or any evidence of resident populations. This species is fairly common at the northern terminus of the Lower Austral Zone in Posey County, Indiana.

***Timandra amaturaria* (Figure 16):** This species was collected at four of our five lights. We usually encounter this species in or right next to hydric hardwood forest, and suspect most populations depend upon this habitat. In some localities, such as Osborne Prairie (Oktibbeha County, Mississippi), we found small numbers in grassland habitat, but mesic hardwood forest occurred in close proximity.

***Orthonama centrostrigaria*:** This is the second geometrid species found at bait during our bioblitz. Six individuals came to bait and the same number came to lights. This is a common and widespread habitat generalist.

***Hydrelia inornata*? (Figure 3):** We were surprised to find one fresh female specimen at our MV sheet, as we have never seen this species from the Lower Austral Zone or from west of the Mississippi River. It is an abundant species in the Appalachian Mountains and foothills. Ideally this specimen should be dissected, but we have only studied the male genitalia of *Hydrelia*.

SPHINGIDAE

***Manduca jasminearum* (Figure 4):** One specimen was collected at the MV Sheet. This species can be fairly common in the Appalachian Region, but in the Lower Austral Zone it is usually uncommon and encountered singly. However, it seems to be a generalist of hardwood forest habitats, including second growth mesic hardwood forest on former agricultural land in northern Florida (Kons and Borth 2006).

***Ceratomia undulosa* (Figure 4):** Six individuals of this widespread habitat generalist came to lights during our bioblitz.

***Isoparce cupressi* (Figure 16):** One fresh specimen was in the MV light trap on 3 June. The larval host is cypress (Robinson et al. 2002), but this species does not occur in all cypress habitats. Few individuals are typically found on individual nights. This species is near the northern limit of its range at Otter Slough, but it reaches the northern inland limit of cypress in southwest Indiana (Kons and Borth 2012).

Paratraea plebeja: One specimen was in the UV light trap on 4 June. This species is rather uncommon at lights in our experience and usually encountered singly; however, it is widespread and not particular in habitat. In Gainesville, Florida, a malaise trap collected over 20 individuals over a three month interval when not a single individual showed up at MV and UV lights in the same area. Thus, this species probably isn't truly uncommon, but just difficult to detect with the usual Lepidoptera survey techniques.

Lathoe juglandis: One specimen was in our UV trap on 4 June. This species is widespread in hardwood forest habitat.

Sphecodina abbottii: One specimen was in a bait trap. This species is typically recorded from bait traps as it seldom comes to lights or bait painted on trees. It is a widespread habitat generalist.

Figure 1: Locations of MV lights. UV Traps. and bait traps deployed at the Otter Slough Conservation Area from 3-4 June 2018. The bait trail was located between the MV sheet (star icon) and the raised observation platform at the end of the hiking trail (square icon). including both sides of the trail loop. Bait traps were located along the beginning of the bait trail. except for the two southern most traps. This figure was produced on Google Earth. imagery date 11/9/2015. eye at 7254 feet.

Amphion floridensis: Three individuals were found at bait. This is a common and widespread habitat generalist that rarely comes to lights.

***Darapsa myron* (Figure 4):** One individual was found on the bait trail and one at MV light. This is a common and widespread habitat generalist.

***Xylophanes tersa* (Figure 4):** One individual of this southern migrant came to the MV sheet. This species is a permanent resident in the gulf region and migrates northward as far as Wisconsin. It is a widespread habitat generalist.

NOTODONTIDAE (Figure 4): All species we recorded from Otter Slough are widespread habitat generalists that we found at lights; however, *Clostera albosigma* is the farthest south we have found this species in the Lower Austral Zone. Specimens HLK examined from Florida identified as *Clostera albosigma* were *Clostera inclusa*.

NOCTUIDAE[4]

***Crambidia pallida, Cisthene plumbea, Hypoprepia fucosa* (Figure 10):** These are common and widespread habitat generalist species found at lights during our bioblitz. The larvae feed on lichens (Robinson et al. 2002).

Haploa lecontei: One specimen was found at the MV light on 3 June. This is the farthest south we have found it at a low elevation site, but we have collected it in central Oklahoma and the Arkansas Ozarks. This species is a habitat generalist in both grassland and woodland habitats.

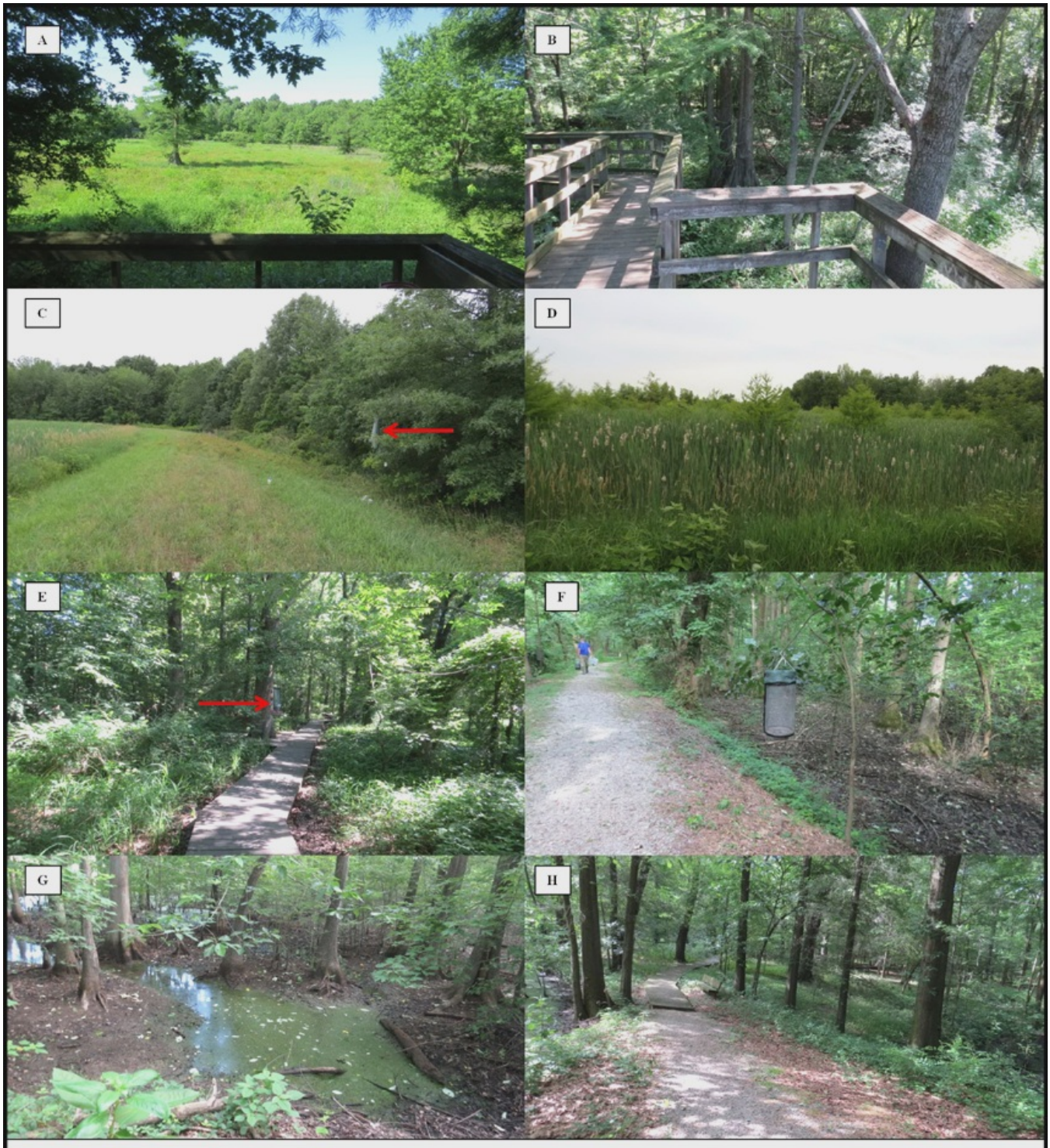

Figure 2: Habitats and survey locations: **A-B**: MV light site of 3 June; the light was hanging in a cypress tree next to the raised boardwalk platform overlooking a large open grassy wetland (A) bordered by hydric hardwood forest (B). **C-D:** UV light trap site of 4 June; the UV trap (red arrow) was along the edge of hydric hardwood forest bordered by a mowed strip and open wetland with cypress, cattails, grasses, and sedges. **E:** UV light trap site of 3 June (red arrow) and MV light site of 4 June; boardwalk through hydric hardwood forest. **F:** One of the bait traps along the hiking trail in hydric hardwood forest. **G:** Pools of standing water were prevalent in the hydric hardwood forest along the hiking trail. **H:** Hiking trail used as a bait trail through hydric hardwood forest. The MV sheet (4 June) was located in the parking lot by the entrance of the hiking trail (not shown) at the edge of hydric hardwood forest.

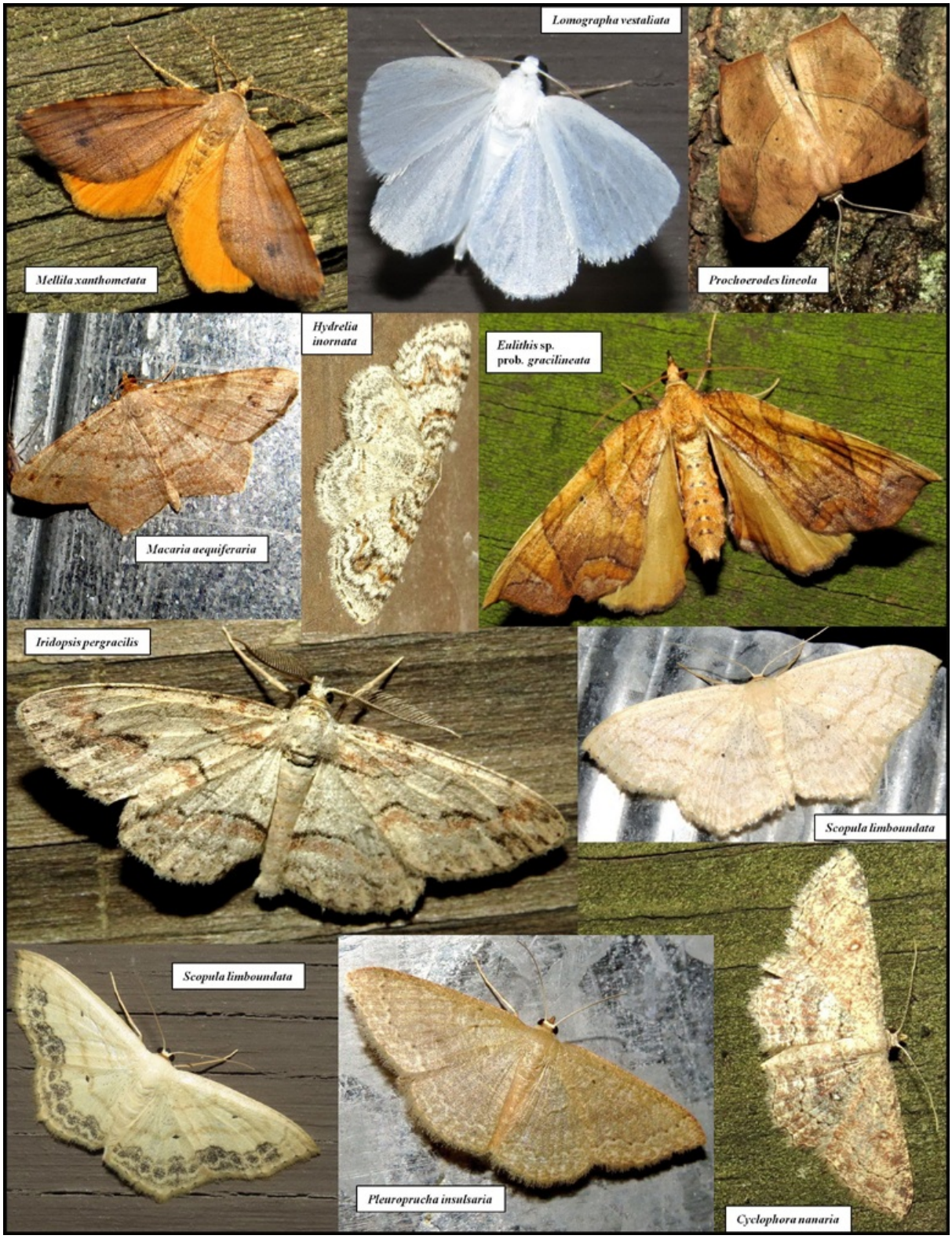

Figure 3: Lepidoptera photographed at the Otter Slough Conservation Area (Geometridae).

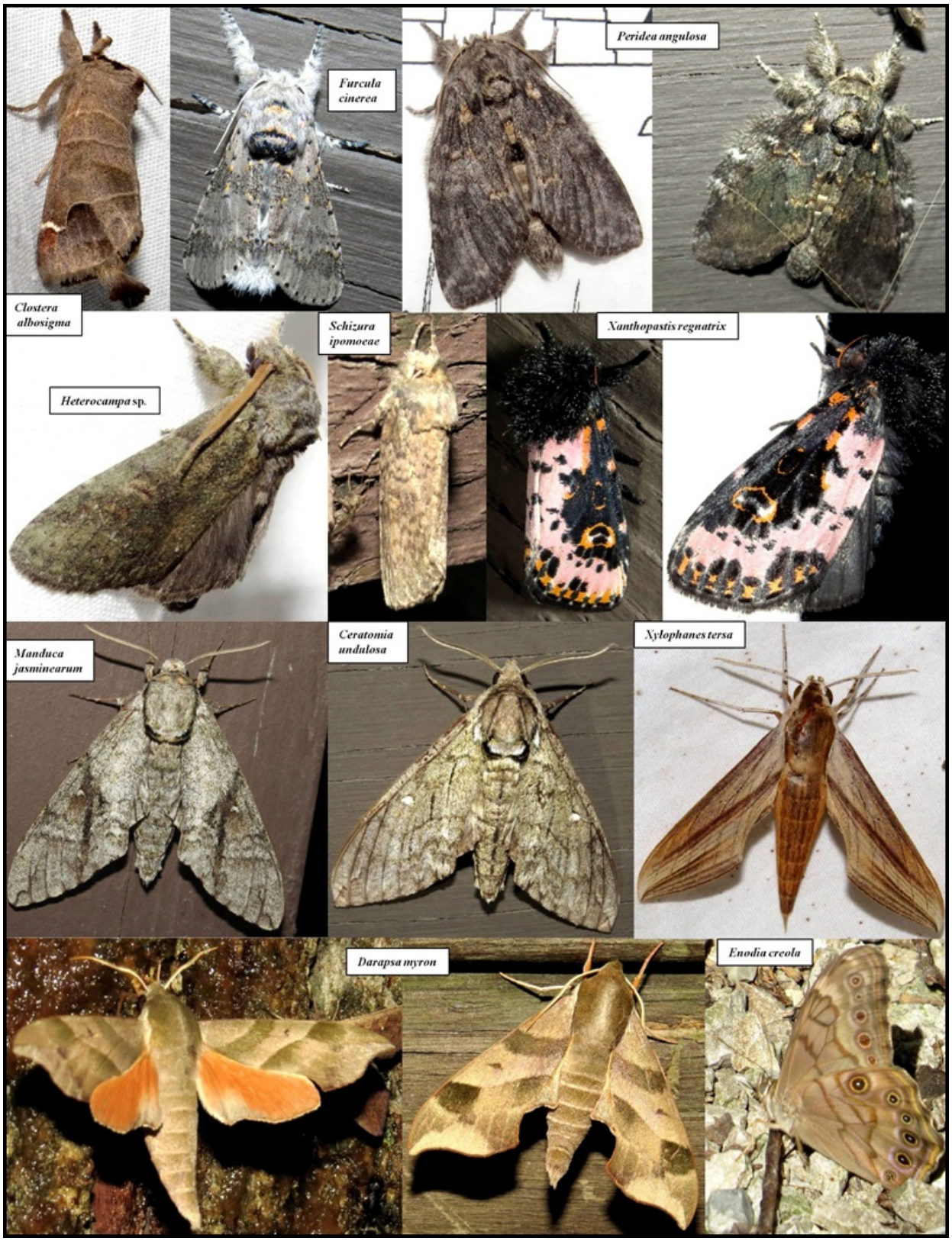

Figure 4: Lepidoptera photographed at the Otter Slough Conservation Area (Notodontidae, Sphingidae, Rhopalocera, and Noctuidae (part)).

***Virbia opella* (Figure 16):** The Lower Austral Zone contains three similar species discussed in Kons et al. (2017). Otter Slough specimens are the nominotypical phenotype. This species is a widespread habitat generalist in the Upper Austral and northern Lower Austral Zones, but it becomes more localized in the gulf region. In the Transition Zone of Wisconsin it appears to be an ephemeral migrant rather than a permanent resident.

***Virbia aurantiaca* (Figure 16):** One specimen was collected at the MV trap on 4 June. This species is usually found in upland habitats, but occasional individuals show up in lowland habitats, perhaps as dispersers.

***Spilosoma virginica, Hyphantrea cunea*:** A few specimens of each species came to lights during our bioblitz. Both species are common and widespread habitat generalists in the eastern U.S.

***Hypercompe scribbonia* (Figure 10):** A few individuals came to the MV sheet, and we observed mid instar larvae feeding on a vine at the edge of the hydric hardwood forest. This species is a widespread habitat generalist in the Upper and Lower Austral Zones, but becomes more localized in the Transition Zone.

***Apantesis phalerata* (Figure 16):** One specimen was found in the light trap on 4 June. This species is widespread in a variety of habitats, but is less common and more localized than the similar *Apantesis nais* (below).

***Apantesis nais*:** Four specimens were found at lights during our bioblitz. This is a widespread habitat generalist in the Lower Austral Zone, but northward it is usually associated with upland grassland habitats.

***Halysidota tessellaris*:** A few individuals were found at the MV light on 3 June. This is one of the most common and widespread Lepidoptera species in the eastern U.S.

***Cycnia tenera* (Figure 10):** This species was fairly common at the MV sheet. It is a common and widespread habitat generalist in most of the eastern U.S., but we have seen no correctly determined material from the Gulf region.

***Euchaetes egle* (Figure 10):** A few individuals were found at the MV sheet. The larvae feed on numerous species of *Aesclepius* (milkweeds) and this species is a widespread habitat generalist in the eastern U.S.

***Cisseps fulvicollis*:** One individual was found at the MV light on 3 June. This is a common and widespread habitat generalist, but it tends to become more common later in the season.

***Idia americalis* (Figure 5):** A common and widespread habitat generalist. Seven and 13 individuals were seen on the bait trail on 3 and 4 June, respectively. This species was also at most of the bait traps and lights.

***Idia aemula* (Figure 5):** Two species go under this name in the east, one which is polymorphic for orange or black reniform/orbicular spots and tends to have a relatively mottled hindwing, and another which always has orange spots and a relatively less mottled hindwing. Only the latter species was found at Otter Slough and elsewhere we have sampled in the Lower Austral Zone. At least three and 12 individuals were found on the bait trail on 3 and 4 June, respectively, but numerous additional individuals came to the bait traps and lights.

***Idia denticulalis* (Figure 10):** A single individual was found during our bioblitz, on the bait trail on 4 June. We usually find this species in mesic and upland habitats.

***Idia lubricalis* species 1 (Figure 5):** Three species diagnosable with wing pattern and COI 5' occur in the east, but only the most common and widespread species was found at Otter Slough. It was abundant on the bait trail, with over 400 and 350 individuals found on the bait trail on 3 and 4 June, respectively. This species was present in every bait trap.

***Zanclognatha obscuripennis* species 1 (Figure 5):** Two specimens in fresh condition were collected on the bait trail on 3 June. This species is widespread in hardwood forest habitats in the Lower Austral Zone, and is likely near the northern limit of its range at Otter Slough.

***Zanclognatha marcidilinea* (Figure 17):** The illustrated specimen from 4 June on the bait trail is the only individual found during our bioblitz. This species is widespread in many habitats.

***Zanclognatha ochreipennis*:** One fairly worn specimen was collected on the bait trail on 4 June. This species is widespread in much of the eastern U.S. but it appears to be mostly absent south of the Upper Austral Life Zone. This specimen may be a stray from Upper Austral Zone habitat.

***Zanclognatha petrealis* (Figure 5):** This species was common on the bait trail, with at least 30 individuals seen each night. It also came to most of our lights and some of our bait traps. We consider *Zanclognatha petrealis* and *Z. morbidalis* to be separate species; they are sympatric in Wisconsin but have different

distributions and *Z. petrealis* emerges later in the season there. In the Lower Austral Zone *Z. petrealis* is locally common in hydric and mesic hardwood forest habitats, whereas we have seldom encountered *Z. morbidalis* south of the Upper Austral Zone.

Macrochilo hypocritalis **(Figure 17):** This species was collected at the MV light on 3 June. It typically occurs in both open wetlands and hardwood forest habitats, and the light was on the boundary of these two habitats.

Macrochilo louisiana **(Figure 17):** This species was collected at the MV light on 3 June, and the open wetland and hydric hardwood forest by this light are typical habitats for this species. It occurs in other habitats as well, but tends to be most common in wetlands.

Bleptina sangamonia **(Figure 5):** Two worn specimens were found landed on a wooden platform near the MV light on 3 June. The identification of the most worn specimen (not shown) was confirmed by genitalic dissection. This species is widely misidentified. We have found it mainly in the Upper Austral Zone and northern Lower Austral Zone, but it rarely strays north into the Transition Zone (Outagamie County, WI). It occurs in a variety of habitats.

Phalaenostola eumelusalis **(Figure 5):** Otter Slough is the farthest south we have encountered this species in the Lower Austral Zone. It also occurs at the northern terminus of the Lower Austral Zone in Posey County, Indiana (Kons and Borth 2012). It occurs in a variety of habitats, including hardwood forest, open wetlands, and grasslands. All individuals we found at Otter Slough were in worn condition.

Tetanolita mynesalis **(Figure 5):** This species is a common and widespread habitat generalist of the Upper and Lower Austral Zones, and in some years it migrates north into the Transition Zone. It comes to lights and bait, but at Otter Slough we found it only at lights.

Renia factiosalis **(Figure 6):** A few specimens were found during our bioblitz, and only one on the bait trail. Most individuals were worn, and this species was probably near the end of the flight of a brood. We have most often encountered this species in hardwood forest, including mesic and hydric sites.

Renia discoloralis **(Figure 6):** This species was common during our bioblitz, and over 50 individuals were found on the bait trail on each date. It is a widespread habitat generalist of the Upper and Lower Austral Zones. It occasionally strays north to the Transition Zone as far north as Outagamie County, WI.

Renia flavipunctalis **(Figure 6):** We found single specimens on the bait trail on each date of our bioblitz. This species is common and widespread in hardwood forest habitats.

Renia adspergillus **(Figure 6):** Over 30 individuals were found on the bait trail on each survey date, and more were found at lights and in bait traps. This species is variable in coloration, ranging from light tan to dark grey. Otter Slough specimens were all dark grey, as is often the case in wetland populations.

Idia rotundalis, Idia julia, Phalaenostola larentioides, Palthis angulalis, Palthis asopialis **(Figure 5):** These are widespread habitat generalists that were found only at lights during the Otter Slough bioblitz, although all of these species do come to bait.

Redectis pygmaea **(Figure 17):** Otter Slough is the most northerly locality where we have encountered this species; it was not found in our survey of similar habitats in Posey County, Indiana. Some of the specimens encountered were in fresh condition. It is a widespread habitat generalist in the Lower Austral Life Zone.

Redectis vitrea**:** This species was found around the MV light on 3 June, and a single specimen was found on the bait trail. It is a widespread habitat generalist of the Upper and Lower Austral Zones.

Rivula propinqualis **(Figure 6):** Only a few individuals of this common and widespread species were found during our bioblitz, including a single individual on the bait trail.

Colobochyla interpuncta **(Figure 17):** This species was found at three of our lights during the bioblitz. It is a widespread habitat generalist in the Upper and Lower Austral Zones, occasionally straying north as far as Outagamie County, WI.

Melanomma auricinctaria **(Figure 17):** This is a habitat specialist associated with hydric hardwood forest, often bottomland forest in river valleys. Otter Slough is the typical habitat. We found it at two MV light stations, but it did not come to bait, as is often the case.

Dyspyralis ocala **complex:** One worn specimen was found at the MV light on 3 June. This species is a widespread habitat generalist in the Lower Austral Zone, but appears to be uncommon in the northern extension of this life zone in southern Missouri and southern Indiana. We had a small series sequenced from Florida and found three divergent haplotype groups, so further

study is needed to determine if this is a species complex. This species is called *Dyspyralis atrinanula* in Kons and Borth (2006) and *Dyspyralis* new species in Kons and Borth (2009, 2012) and Kons et al. (2017).

***Schrankia macula*:** One worn specimen was found at the MV light on 3 June. This is a widespread habitat generalist of the Lower Austral Zone near the northern limit of its range, although we have found it at the northern terminus of the Lower Austral Zone in Posey County, Indiana.

***Nigetia formosalis* (Figure 6):** Seven and 12 individuals were found on the bait trail on 3 and 4 June, respectively, and this species came to most of our lights. It is a widespread habitat generalist of the Upper and Lower Austral Zones, occasionally straying north to Wisconsin.

***Hypena baltimoralis* (Figure 7):** We only encountered this species around the MV light on 3 June during our bioblitz. It is a widespread habitat generalist.

***Hypena palparia*:** This species was found at MV lights during our bioblitz. It is usually found in xeric uplands in the Canadian and Transition Zones, but farther south it becomes more general, with some populations associated with hydric hardwood forest.

***Hypena madefactalis* (Figure 17):** One female was found at MV light during our bioblitz. This species is more typically found in mesic hardwood forest than the wetter habitats of Otter Slough.

***Hypena scabra* (Figure 7):** Small numbers of worn individuals were found during our bioblitz, with only six found on the bait trail. This species typically becomes more common in late summer and fall. It is one of the most widespread habitat generalists in the eastern U.S.

***Spargaloma sexpunctata* (Figure 7):** Two individuals were found at bait during our bioblitz. This is the farthest south we have found this species at low elevations. We also found it in Lower Austral Zone habitats in Posey County, Indiana (Kons and Borth 2012). It occurs in woodland and grassland habitats and upland and lowland habitats, yet it appears to be somewhat local in occurrence.

***Ledaea perditalis* (Figure 7):** Four individuals were found on the bait trail. Hydric hardwood forest is a typical habitat for this species in the eastern U.S. HLK has reared it on buttonbush (*Cephalanthus occidentalis*) in Florida and Wisconsin, a host reported in Rings et al. (1992).

***Isogona tenuis* (Figure 7):** This species came to our MV lights and one individual came to the bait trail. HLK has reared this species on *Celtis* in Florida, and this widespread species occurs in a variety of habitat types where *Celtis* occurs.

***Metalectra discalis* (Figure 7):** This was one of the most common species on the bait trail, with over 200 and 220 individuals on 3 and 4 June, respectively. It was also present in most bait traps, and a few individuals came to lights. This species is a common and widespread habitat generalist in the Upper and Lower Austral Zones, but becomes somewhat more localized to the north.

***Metalectra quadrisignata* (Figure 7):** This species was also common at bait, with over 100 individuals seen on the bait trail and in bait traps. None came to lights. It is a common and widespread habitat generalist.

***Scolecocampa liburna* (Figure 7):** Nine individuals were found on the bait trail and this species was found in one UV trap sample. It is a common and widespread habitat generalist in the Upper and Lower Austral Zones. The larvae occur in rotten wood of large logs.

***Hypsoropha hormos* (Figure 7):** This species was found at most of our lights, but surprisingly none came to bait during our bioblitz. It is a widespread habitat generalist in the Upper and Lower Austral Zones, rarely straying north as far as Outagamie County, WI.

***Calyptra canadensis*:** A single individual found on the bait trail on 4 June was one of the most surprising distributional records of our bioblitz. This is the only specimen we have collected or examined from the Lower Austral Zone. We suspect this individual may be a stray from Upper Austral Zone habitat. Rings et al. (1992) report the larval host is *Thalictrum.*

***Scoliopteryx libatrix* (Figure 8):** One fresh specimen found on the bait trail is our most southerly distributional record for a low elevation site. However, Lance Durden has found this species in bait traps near Statesboro, Georgia (pers. com. 2021), and Ed Knudson once found a single stray in Houston, Texas. We have found this species in numbers in Posey County, Indiana, at the northern terminus of the Lower Austral Zone (Kons and Borth 2012). North of the Lower Austral Zone this species is a widespread habitat generalist. All of our Lower Austral Zone localities are hydric hardwood forest.

***Panopoda rufimargo* (Figure 8):** About ten individuals of this species came to our MV sheet on 4 June. It is a widespread habitat generalist in the Upper and Lower Austral Zones, but becomes more localized northward in the Transition Zone.

***Melipotis jucunda*:** One specimen was found in a bait trap. This species appears to be uncommon in the northern Lower Austral Zone, and we have occasionally found it farther north in Posey County, Indiana. Farther south it becomes much more common and widespread. It tends to be most common in upland habitats, although it is a widespread habitat generalist in the Gulf states. It is unclear if southern Indiana and southern Missouri records are from resident populations, as this species is migratory, rarely straying as far north as Outagamie County, Wisconsin.

***Zale lunata* (Figure 8):** This species was common on the bait trail, with over 70 and 100 individuals found on 3 and 4 June, respectively. An additional 15 individuals came to bait traps, but only a single individual was found at lights. This is a common and widespread habitat generalist.

***Zale galbanata* (Figure 8):** This was one of the most abundant Lepidoptera species on the bait trail, with over 200 individuals seen on each night. An additional 15 individuals came to bait traps, but only one came to lights. This is a common and widespread habitat generalist of any habitat with Maple (*Acer*). Rings et al. (1992) report is uses multiple species of *Acer* as larval hosts.

***Allotria elonympha* (Figure 17):** Only one individual was found during our bioblitz, on the bait trail on 4 June. This is a widespread habitat generalist in the Upper and Lower Austral Zones.

***Dysgonia telma* (Figure 10):** Two individuals were found on the bait trail during our bioblitz. This species is widely distributed in the Lower Austral Zone but appears to be dependent on hydric hardwood forest habitats. It occurs at the northern terminus of the Lower Austral Zone in Posey County, Indiana (Kons and Borth 2012). The generic placement is provisional, as both the genera *Dysgonia* and *Gondysia* are likely paraphyletic.

***Parallelia bistriaris* (Figure 8):** This was one of the most common species on the bait trail, with over 300 individuals seen on each night, and over 25 more in the bait traps. No individuals came to lights. It is common and widespread in hardwood forest habitats.

***Cutina distincta* (Figures 8 & 14):** Over 20 and 30 individuals were seen on the bait trail on 3 and 4 June, respectively. It also came to all of our lights, but only three came to bait traps. The larvae of this species feed on cypress (Pogue and Ferguson 1998). It is one of the most widespread of the cypress feeding species, occurring in any type of cypress habitat.

***Caenurgina erechtea, Caenurgina crassiuscula*:** These species were flushed out of tall grass walking through fields during the day. A few came to bait: one individual of each species came to a bait trap and two individuals of *C. crassiuscula* came to the bait trail. Both were flying around the MV light on 3 June but only single individuals ended up in the trap. These species are common in grasslands, including fields, but can show up in any habitat type. They are common and widespread north of the Lower Austral Zone, but within the Lower Austral Zone they appear to be residents only of the northern portion. At low elevations of the Gulf states we have found only isolated specimens, presumably strays.

***Celiptera frustulum* (Figure 8):** Five individuals were found on the bait trail, and none at lights. This is a widespread habitat generalist of the Upper and Lower Austral Zones.

***Spiloloma lunilunea* (Figure 8):** About 55 individuals were found on the bait trail, only one in a bait trap, and none at lights. The larval host is *Gleditsia* (Rockburne and Lafontaine 1976), and hydric hardwood forest populations are associated with *Gleditsia aquatica*, whereas upland populations are associated with *Gleditsia tricanthos*. This species is usually found where *Gleditsia* occurs in the Upper and Lower Austral Zones, except for peninsular Florida.

***Catocala ultronia*:** One fresh specimen was found on the bait trail on 4 June. It was likely first emerging and we suspect this species would be common a little later in the season. It is a common and widespread habitat generalist in the eastern U.S.

***Catocala crataegi* complex (southern clade) (Figure 9):** This species was our primary goal to locate and it turned out to be common during our bioblitz, with over 100 individuals found at bait and two at the MV sheet. The range of pattern variation is comparable to populations in eastern Texas. The DNA confirmed it is in the same southern clade as material from Texas and Mississippi, but the haplotype was a little different. Male and female genitalia are the same morphotype that occurs in both *crataegi* complex clades, but the everted vesica differs from *C. aestivalia* as noted in Kons and Borth (2015b). The details of the morphological and genetic analysis will be presented in an upcoming taxonomic paper. The habitat of the southern clade is hydric hardwood forest at all of our sites in eastern Texas, and some of the sites also have sloughs, including the Sabine National Forest, Martin Dies Jr. State Park, and Caddo Lake State Park. The northern clade is less particular in habitat, and occurs in hydric and mesic hardwood forests.

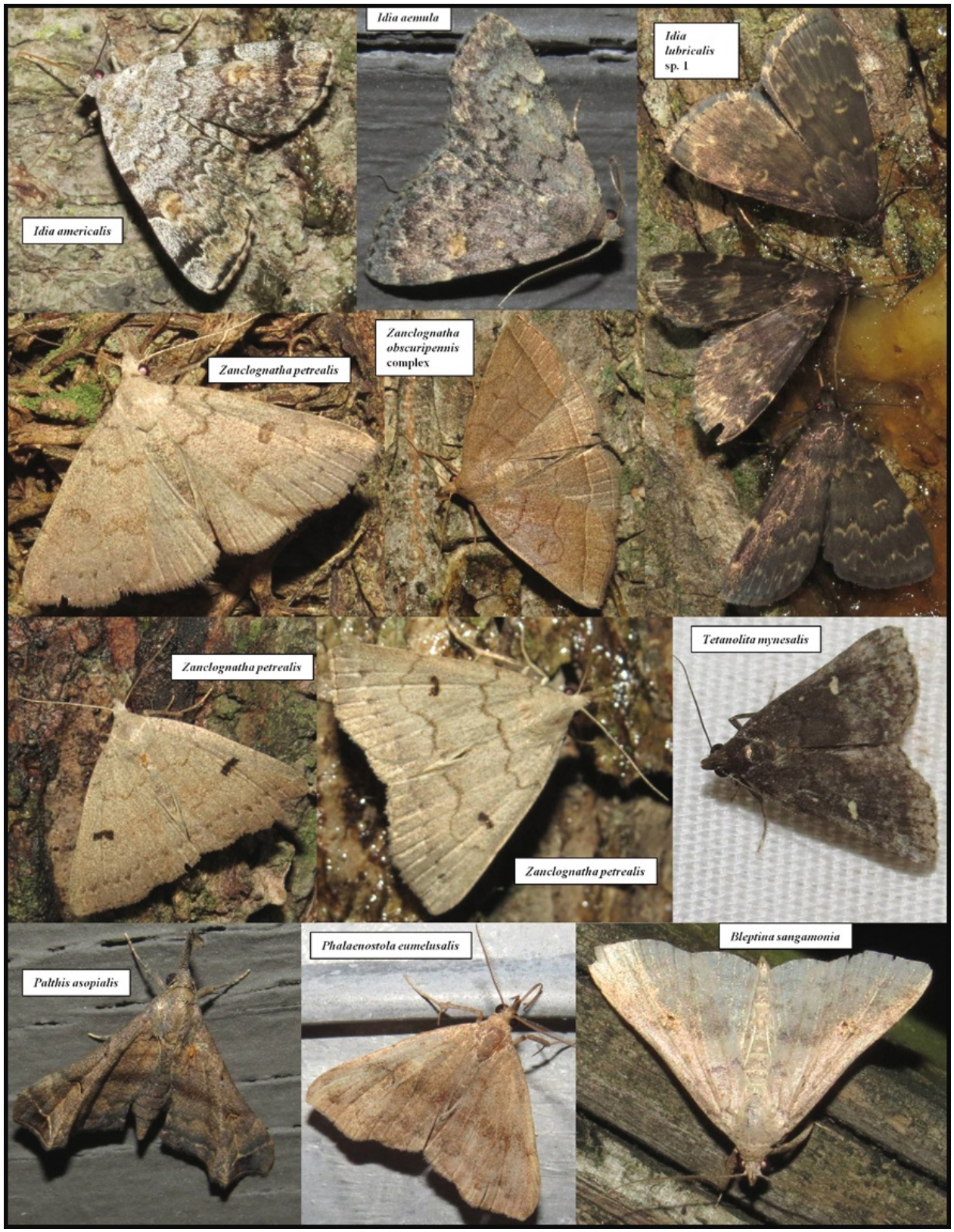

Figure 5: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

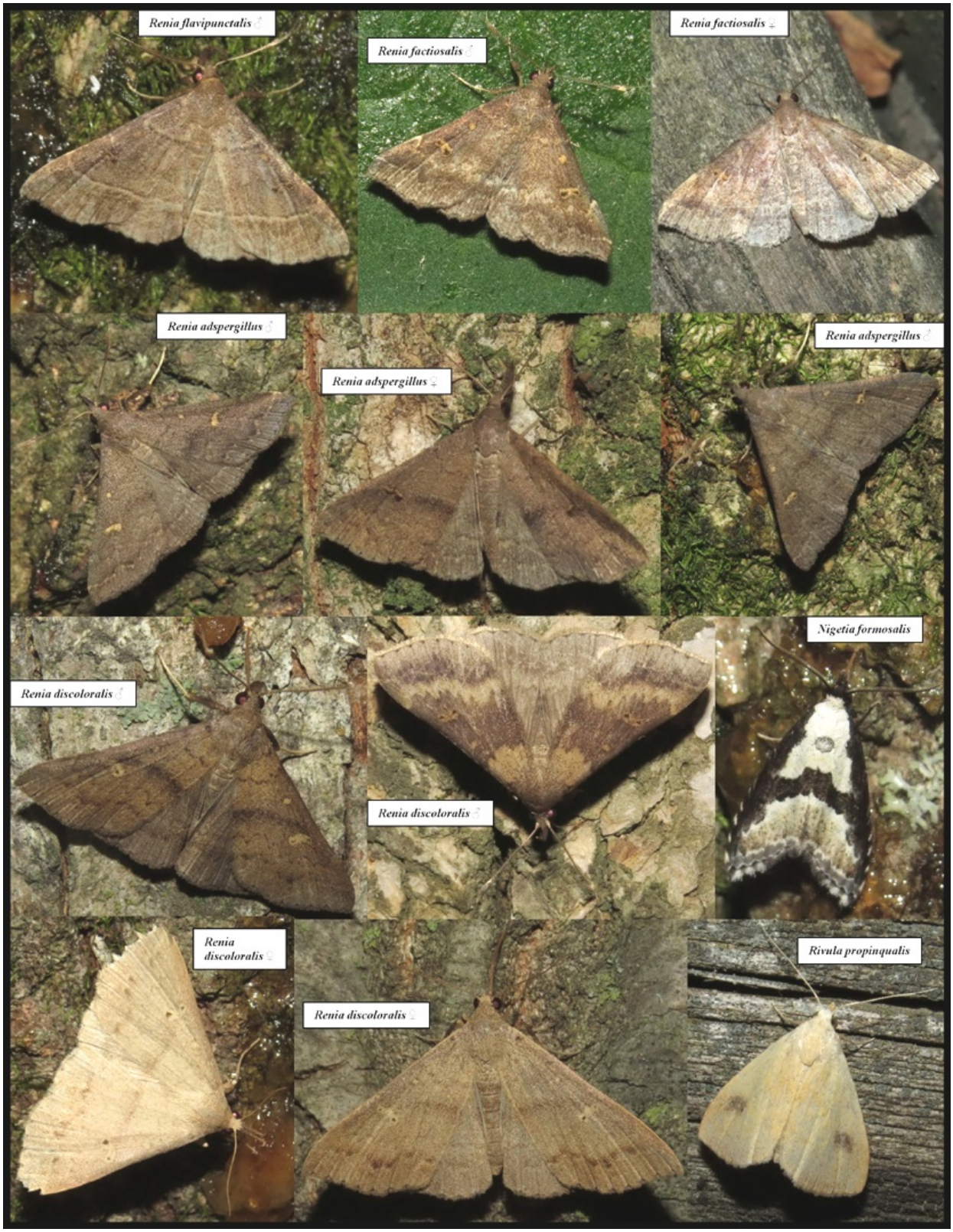

Figure 6: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

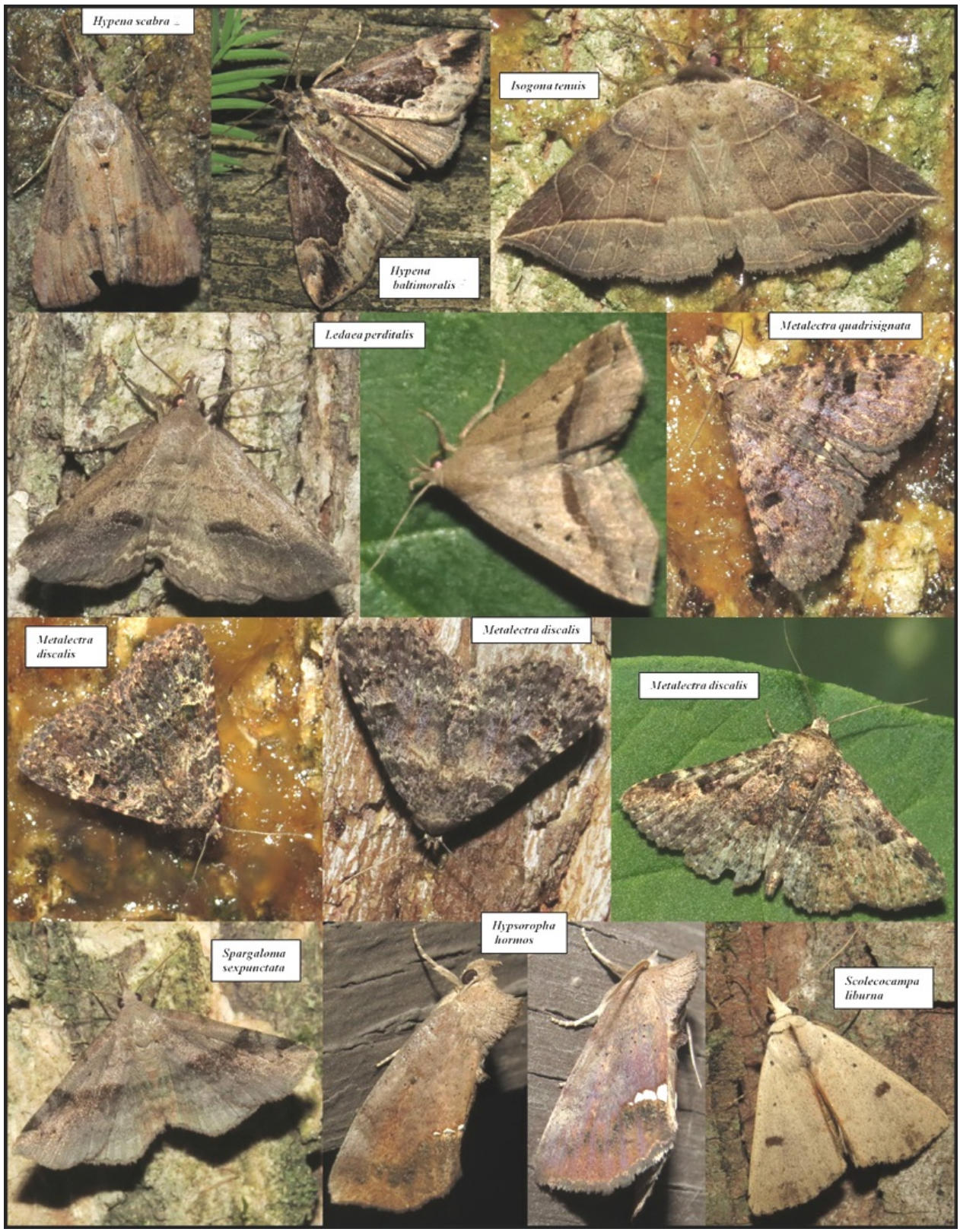

Figure 7: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

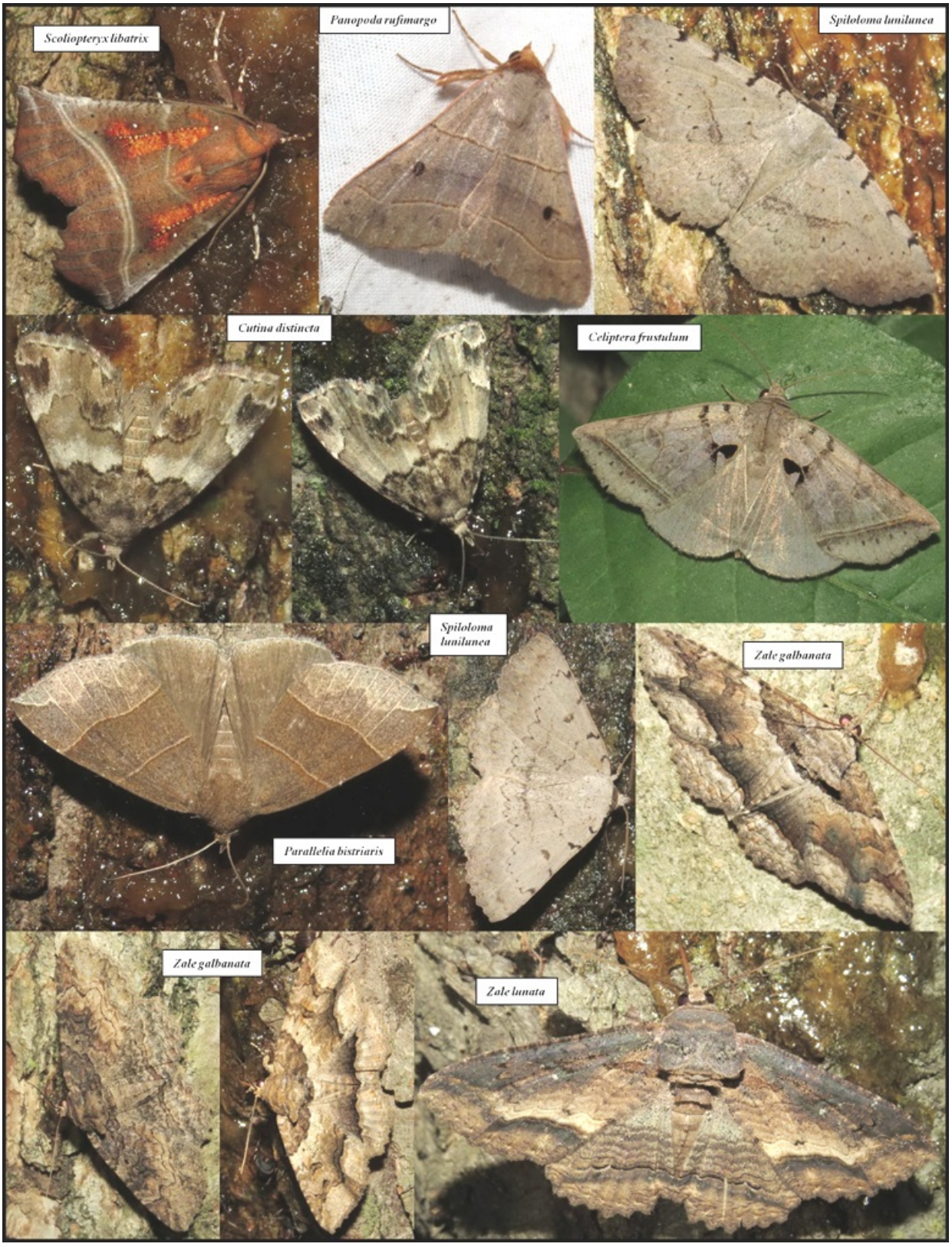

Figure 8: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

[*Catocala pretiosa* (=*C. texarkana*)]: We didn't find any authentic specimens of *C. pretiosa* during our bioblitz, and we suspect previous reports of *C. pretiosa* and its synonym *C. texarkana* from Otter Slough all refer to the above species. *Catocala pretiosa* differs from the *C. crataegi* complex by having a more strongly contrasting brighter white border around the reniform spot; and it also forms a separate genetic clade with COI 5'.

Catocala minuta **(Figure 9):** Three freshly emerged individuals were found at bait and one at the MV sheet. This species appears to have been first emerging during our bioblitz. The larval host is *Gleditsia* (Rings et al. 1992). The habitat is the same as for *Spiloloma lunilunea*, as the two species typically co-occur, except *C. minuta* ranges farther south into peninsular Florida and farther north into the Transition Zone.

Marathyssa inficita**:** A common and widespread habitat generalist found at our MV lights.

Garella nilotica **(Figures 10 & 17):** This tiny noctuid was found at our MV lights. It is a common and widespread habitat generalist in the Lower and Upper Austral Zones that migrates northward, but it is underrepresented in collections likely due to its small size.

Nycteola metaspilella **(Figure 17):** Two individuals were found at lights and two on the bait trail. This species is usually found in or near wetlands, and HLK has reared it from *Salix* growing in open-shrubby wetlands in Florida. It is probably the only *Nycteola* that occurs in the Lower Austral Zone, but it is sometimes misidentified as *Nycteola frigidana*.

Nola cereella**:** A few specimens were found at our lights. This species is probably a southern migrant rather than a permanent resident of southern Missouri. It is a common and widespread habitat generalist, tending to become more common later in the season even as far south as north peninsular Florida.

Hyperstrotia villificans **complex (Figure 17):** Two species are recognized on the basis of COI 5' data in Schmidt et al. (2018), but our collections contain sequenced specimens from only one of the haplotype groups, and we cannot confidently separate them at this point.

Marimatha nigrofimbria **(Figure 10):** This species was common around our MV light on 3 June. It is one of the most common and widespread Lepidoptera species in the Upper and Lower Austral Zones.

Protodelte muscosula**:** Numerous individuals landed in the vegetation around the MV light on 3 June, but only one was found at bait. This is a common and widespread habitat generalist.

Pseudeustrotia indeterminata **(Figure 10):** Over 30 individuals were found on the bait trail but it was only present in one light trap sample. This species appears to be dependent on hydric hardwood forest habitat (Kons and Borth 2006). Otter Slough is the only site where we have found *Pseudeustrotia carneola* and *P. indeterminata* to be sympatric, confirming that they are separate species and not geographic variants. This species may be at the northern limit of its range, and we did not record it from the northern terminus of the Lower Austral Zone in Posey County, Indiana (Kons and Borth 2012), although perhaps our seasonal timing was off during these surveys.

Pseudeustrotia carneola **(Figure 10):** Over 60 individuals were found at bait and it was also numerous around the MV lights. Otter Slough is the farthest south we have found this species at a low elevation site. *Pseudeustrotia carneola* is sometimes attributed to Florida (MPG map, for example), but the Florida specimens we have seen were misidentified *P. indeterminata*. This species is one of the most common and widespread habitat generalists of the Canadian-Upper Austral Life Zones, but it appears to be largely absent from the Lower Austral Zone except at the northernmost areas.

Condica videns**:** A few individuals were found around the MV light on 3 June. This species is a common and widespread habitat generalist.

Condica vecors **(Figure 11):** Seventeen individuals were found at bait and several more came to the MV sheet on 4 June. This is a widespread habitat generalist.

Condica sutor **(Figure 11):** Thirteen individuals were found at bait and none at lights. This is a common and widespread habitat generalist of the Upper and Lower Austral Zones, recently making regular migrations into the Transition Zone as far north as Outagamie County, WI.

Condica confederata **(Figure 11):** One fresh specimen was collected on the bait trail on 4 June. This is a tropical migratory species. At the latitude of Gainesville, FL it becomes common in some seasons and is absent in others, but we have rarely found it inland north of the Gulf states. It rarely strays as far north as Outagamie County, Wisconsin.

***Perigea xanthioides*:** This species was found in only one light trap sample. It is a common and widespread habitat generalist of the Upper and Lower Austral Zones.

***Ogdoconta cinereola* (Figure 11):** Over 30 individuals were found at bait, and it was found at most of our lights. This is a common and widespread habitat generalist.

***Homophoberia apicosa* (Figure 11):** Over 90 individuals were found at bait but only a few at lights. This is a common and widespread habitat generalist.

***Leuconycta diptheroides* (Figures 11 & 17):** Two individuals were found at bait and two at MV light. Otter Slough is the farthest south we have found this species at a low elevation Lower Austral Zone site. It is a widespread habitat generalist from the Canadian to Upper Austral Zones. We don't know what Florida reports of *L. diptheroides* refer to; we haven't seen any material resembling this species from Florida.

***Leuconycta lepidula* (Figure 11):** Two worn individuals were found on the bait trail. Otter Slough is the farthest south we have found typical specimens of this species at a low elevation Lower Austral Zone site. However, a *Leuconycta* similar to *lepidula* has a disjunct range from western Florida to eastern Texas; we suspect this is a separate species, although more study is needed. Typical *L. lepidula* is a habitat generalist from the Canadian to Upper Austral Zones.

***Pseudoplusia includens*:** One specimen of this southern migratory species was collected at the MV light on 3 June. It is a habitat generalist that becomes more common in late summer and the fall.

***Allagrapha aerea* (Figures 11 & 16):** This species was found at all of our lights. Most individuals were in somewhat worn condition. This species is a widespread habitat generalist from the Canadian to Upper Austral Zones, but it becomes more localized in the Lower Austral Zone where it is usually found in hydric hardwood forest.

***Tarachidia erastrioides* (Figure 10):** This species was found at most of our lights and was common at the MV light on 3 June. It is a widespread habitat generalist from the Canadian to northern Lower Austral Zone, but in the southern Lower Austral Zone it only occasionally occurs as an isolated stray. It is generally more common in grassland and open habitats than woodland habitats.

***Spragueia dama*:** Two specimens were found in one of our UV light traps. It is a habitat generalist of the Lower Austral Zone, but tends to be most common in open habitats and varies greatly in abundance at the same locality between seasons.

***Spragueia leo*:** A few specimens were found at one of our UV lights. This is a widespread habitat generalist from the southern Transition to Lower Austral Zones.

***Acontia aprica*:** A few specimens were found at the MV light on 3 June. In the eastern U.S. this is a widespread species in grassland habitats in the Upper Austral and northern Lower Austral Zones, but becomes less common and more localized in the southern Lower Austral Zone.

***Acontia delecta* (Figure 17):** One male and one female specimen were found in separate light trap samples in areas with both hydric hardwood forest and open wetland habitats. Of all the Macrolepidoptera species we recorded from Otter Slough this is the one we are the least familiar with. The only other time we encountered it was at Twin Swamps in Posey County, Indiana: one specimen in a field next to hydric hardwood forest. We have also seen specimens from western Kentucky and eastern Oklahoma. Kimball (1965) dubiously reported it from Florida, but we have never seen specimens from anywhere near Florida. Reported host plants are Malvaceae: *Abelmoschus moschatus* and *Hibiscus moscheutos* (Robinson et al. 2002, Poole 1989, Tietz 1972, Zhang 1994). The former is not native to North America and the latter has a much more extensive distribution than the moth.

***Callopistria floridensis*:** One specimen was in the MV trap on 3 June. This is probably a stray or migrant north of its permanent range. In the Gulf region it is a widespread habitat generalist of fern habitats. It appears to be migrating northward more frequently than was historically the case; for example, it has been found in Outagamie County, Wisconsin, during four seasons from 2016-2020, whereas in the early and mid 1990s we had no WI records at all.

***Azenia obtusa*:** A number of individuals came to our MV lights. This is a widespread habitat generalist in the Upper and Lower Austral Zones.

***Helicoverpa zea*:** One specimen was found at the MV light on 3 June. This is a southern migratory species but it can be found year round in the Gulf region where it must be a permanent resident. It is most common in late summer and fall. This species is a widespread habitat generalist and an agricultural pest.

***Acronicta americana* (Figure 12):** One somewhat worn specimen was found on the bait trail and one was found in a UV light trap. This is a widespread habitat generalist.

***Acronicta lobeliae*:** A few individuals were found at the MV sheet on 4 June. This is a widespread habitat generalist, but typically it is found in small numbers on individual nights.

***Acronicta haesitata* (Figure 11), *Acronicta immodica, Acronicta afflicta, Acronicta longa*:** These species were found at lights and not bait at Otter Slough, although they will come to bait sometimes. All are widespread habitat generalists in the Upper and Lower Austral Zones; *A. longa* and *A. afflicta* become more localized north of the Upper Austral Zone whereas the other two species remain widespread. *Acronicta immodica* is largely absent from the Gulf region, although it does occur along the Apalachicola River in the central Florida panhandle. At Otter Slough it is probably near the southern limit of the portion of the range where it is widespread.

***Acronicta exilis, Acronicta retardata* (Figure 12):** Two specimens of each species were found at bait and several came to the MV sheet. These species are widespread in hardwood forest habitats in the Upper and Lower Austral Zones but become more local and uncommon in the Transition Zone.

***Comochara cadburyi* (Figure 11):** This species was fairly common at the MV sheet and was in two light trap samples. It occurs in the Upper and Lower Austral Zones where it is somewhat localized in hardwood forest habitats. Most of our specimens are from hydric hardwood forest, although smaller numbers have been found in mesic sites. An alternative generic classification of *Polygrammate* was recently proposed (Smith and Anweiler 2020), but we do not favor generic name changes that do not correct errors in the existing classification.

***Phosphila miselioides* (Figure 12):** At least nine individuals were found at bait and a few more were found at two of our lights. This is a widespread habitat generalist in the Upper and Lower Austral Zones but it becomes more localized northward in the Transition Zone.

***Apamea cariosa* (Figure 18):** One specimen was collected on the bait trail and confirmed with genitalic dissection. Several more possible individuals were seen (including Figure 12) and one was collected, but this species cannot be reliably identified without dissection. The similar *Apamea quinteri* also occurs in southern Missouri, and we have collected this species along the Glade Top Trail in the Mark Twain National Forest. Otter Slough is the only locality where we have found *Apamea cariosa* in the Lower Austral Zone, and here it is probably near or at the southern limit of its range at low elevation sites. This species occurs mainly in the Transition and Upper Austral Zones where it is somewhat local in occurrence but not restricted to a particular habitat type. It occurs in woodland and grassland habitats and hydric, mesic, and xeric sites.

***Resapamea passer* (Figure 18):** Thirteen individuals were collected in the MV light trap on 3 June, but none were found at our other lights. This is the largest number of individuals of this species we have ever found in a single light trap sample, and one or two specimens are more typical. Localities where we have found this species in numbers contain wetlands, but the type of wetland varies greatly, although part of the wetland is always open rather than completely forested. Otter Slough is the only locality where we have found this species in the Lower Austral Zone, and it is probably near or at the southern limit of its range for a low elevation site.

***Oligia modica*:** One specimen was collected on the bait trail on 4 June, and it may be at or near the southern limit of its range for a low elevation site. We also found this species in similar habitat at the northern terminus of the Lower Austral Zone in Posey County, Indiana (Kons and Borth 2012). This is a common and widespread habitat generalist from the Canadian to Upper Austral Zones.

***Globia oblonga* (Figure 18):** One specimen was collected in the UV trap on 4 June. This species is a habitat specialist of open wetlands, usually sedge meadows. Sedge meadow elements occur in the open marsh and edge of the hydric hardwood forest by this trap. A reported host is *Typha* (Rings et al. 1992); however, we have only found this species in numbers in habitats with sedge meadow present.

***Xylomoia chagnoni*:** One specimen was collected in the UV trap on 4 June. This is the farthest south we have seen this species and our only specimen from the Lower Austral Zone. Our experience with this species is mainly from Wisconsin, where it is a widespread habitat generalist.

***Achatodes zeae* (Figure 18):** One specimen was collected in the UV trap on 4 June. This is a species we encounter infrequently and usually as one or two individuals at a time, but it does not appear to be particular in habitat. We suspect this species comes to lights or bait infrequently and is easily missed in biodiversity inventories.

***Dypterygia rozmani* (Figure 12):** Over 60 individuals were found at bait, and one came to the MV sheet. This is the farthest south we have found this species in numbers in the Lower Austral Zone, but it rarely strays south (or is accidentally transported by human activity) to the Gulf region where we have taken single worn specimens in east Texas and north peninsular Florida. It is a widespread habitat generalist in the Upper Austral and Transition Zones.

***Spodoptera frugiperda* (Figure 12):** A few specimens were found in two light trap samples. This is a migratory species and we are not sure if it is a permanent resident or migrant at Otter Slough. This is a widespread habitat generalist and an agricultural pest.

***Spodoptera ornithogalli* (Figure 12):** Sixteen individuals were found at bait and several more in two light trap samples. This is a migratory species and we are not sure if it is a permanent resident or migrant at Otter Slough. This is a widespread habitat generalist and an agricultural pest.

***Elaphria chalcedonia*:** A few individuals were found at the MV sheet but surprisingly none came to bait. This is a common and widespread habitat generalist in the Lower Austral and southern Upper Austral Zones. It is migratory, and in recent years, it has been found in numbers as far north as Outagamie County, Wisconsin.

***Elpahria grata* (Figure 12):** Three individuals were found at bait, but it was also found at all but one of our lights. It is a widespread habitat generalist in the Lower and Upper Austral Zones but becomes more uncommon and localized in the Transition Zone.

***Galgula partita*:** Several individuals came to the MV light on 3 June, but surprisingly it was not found at bait. This is one of the most common and widespread habitat generalists in the eastern U.S.

***Lacinipolia renigera*:** Two specimens were found at bait and one at light. This is the farthest south we have found this species in the Lower Austral Zone. From the Canadian to Upper Austral Zones it is a common and widespread habitat generalist.

***Pseudaletia unipuncta* (Figure 12):** This migratory species was the most common Lepidoptera species during our bioblitz. We roughly estimate over 2500 individuals were on the bait trail each night, and it was in every bait trap and at every light. Some baited trees contained over 100 individuals at once. Surprisingly, dozens of individuals were actively coming to the bait in the afternoon under sunny conditions, a behavior we had not noted previously despite having encountered this species myriad times at bait. This is one of the most common and widespread Lepidoptera species in the eastern U.S.

***Leucania linda* (Figure 18):** Two worn specimens were taken in the UV trap on 4 June. This species is a widespread generalist from the Transition to northern Lower Austral Zones, but it is uncommon in the Gulf region. It is most common in grassland habitats, but can show up in many habitat types.

***Orthodes crenulata* (Figure 12):** Two individuals were found on the bait trail and one in a UV trap. *Orthodes crenulata* is a species complex, with a widespread habitat generalist species in the eastern U.S. and another species in the southwestern U.S. Recently the name *majuscula* has been applied to both species, which seems highly unlikely as the type of *majuscula* is from Cuba, and to our knowledge eastern *crenulata* is absent from the subtropical region of southern Florida.

***Xanthopastis regnatrix* (Figure 4):** Ten individuals were found at the MV sheet and one in the UV trap on 4 June. This species is specific to the Lower Austral Zone. At the northern terminus of the Lower Austral Zone in Posey County, Indiana, we have found and reared the larvae on *Hymenocallis occidentalis* (spider lily) growing in swamp flatwoods, a type of hydric hardwood forest (Kons and Borth 2012). From our localities in Florida, Texas, Missouri, and Indiana, this species appears to be hydric hardwood forest dependent. In Kons and Borth (2006, 2012) this species was called *Xanthopastis timais*.

***Agrotis malefida*:** One specimen was collected at the MV sheet. This is a southern migratory species and we suspect the Otter Slough record represents a stray rather than a resident species. This species is an ephemeral migrant at the latitude of Gainesville, Florida, but it is regularly present in the Lower Sonoran Life Zone of Texas. Material from these two areas may represent different populations (or species), and we suspect the Otter Slough specimen originates from the southwest. Our most northerly record is a single stray from Outagamie County, WI. This species is a habitat generalist.

***Agrotis ipsilon* (Figure 12):** Over 200 individuals were found on the bait trail each night, over 25 were present in bait traps, and lower numbers were found at lights. This is a migratory species and one of the most common and widespread habitat generalists in the eastern U.S.

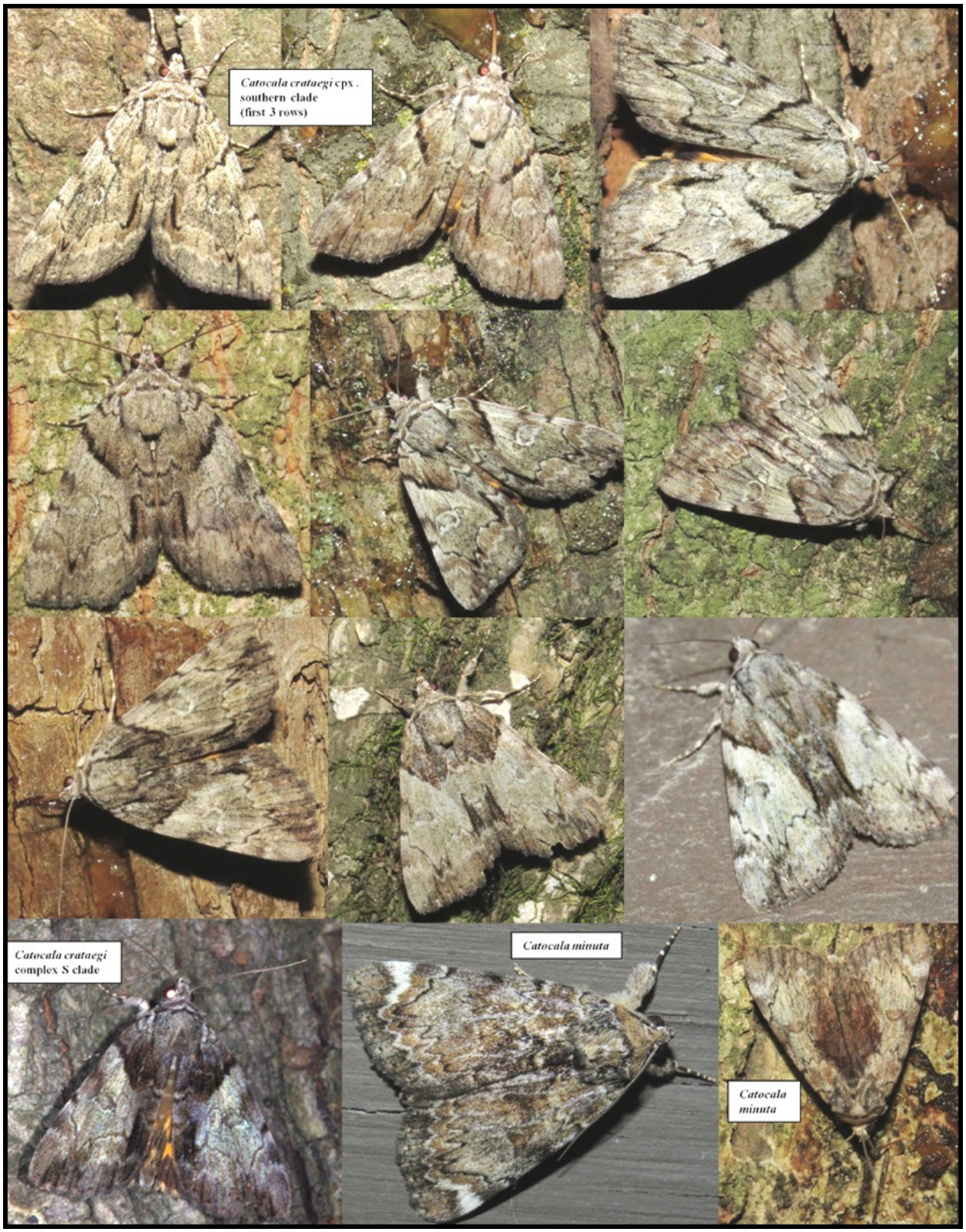

Figure 9: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

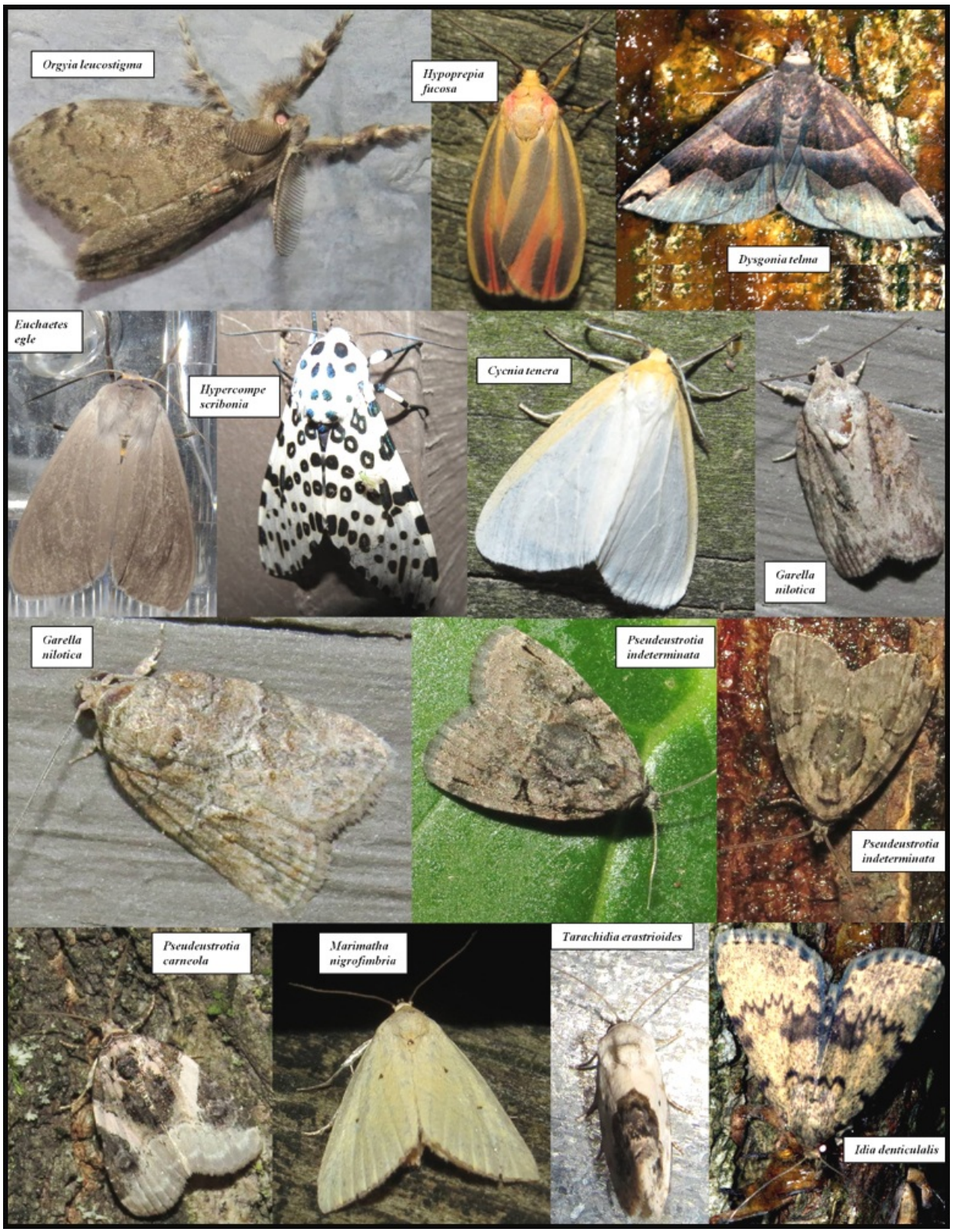

Figure 10: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

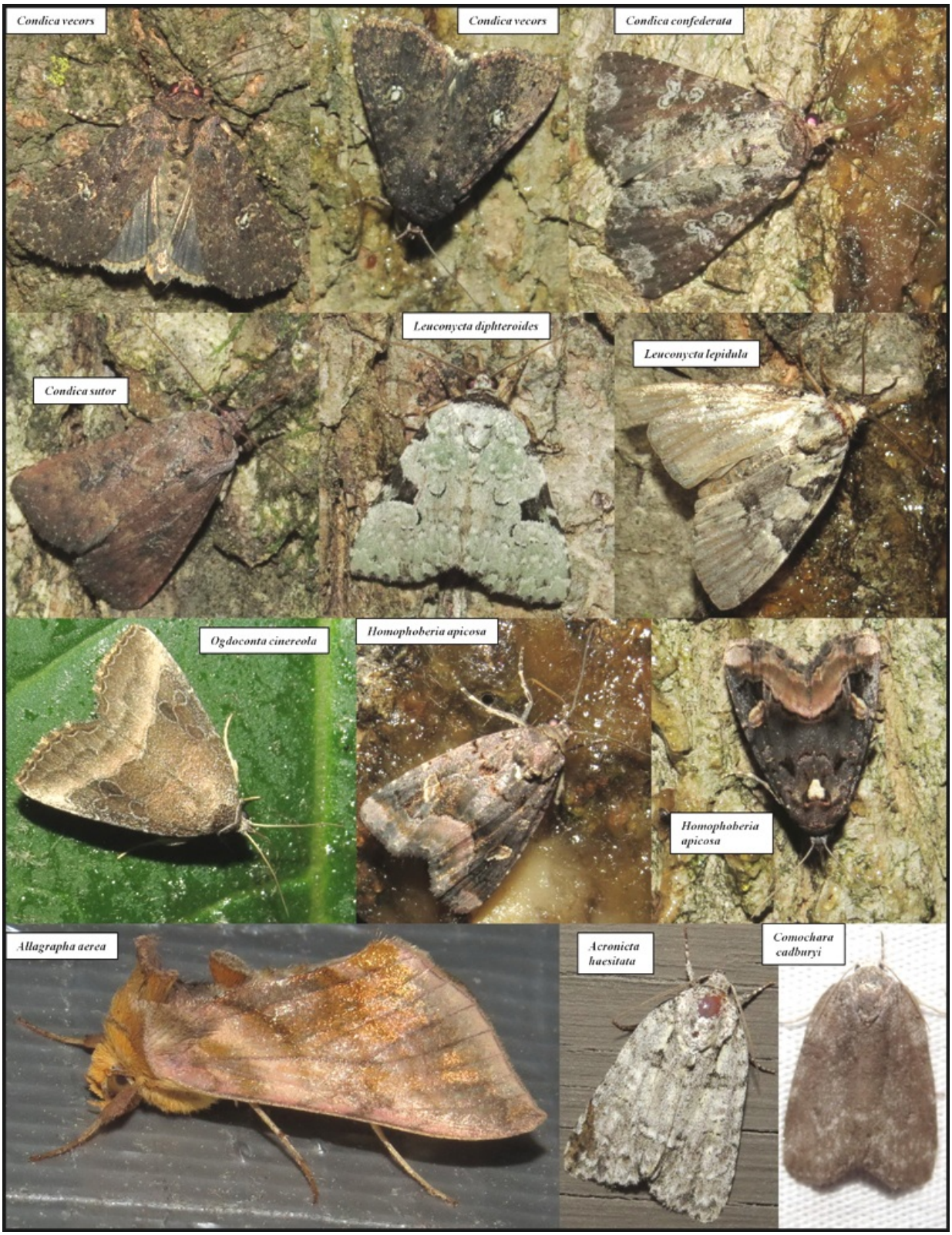

Figure 11: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

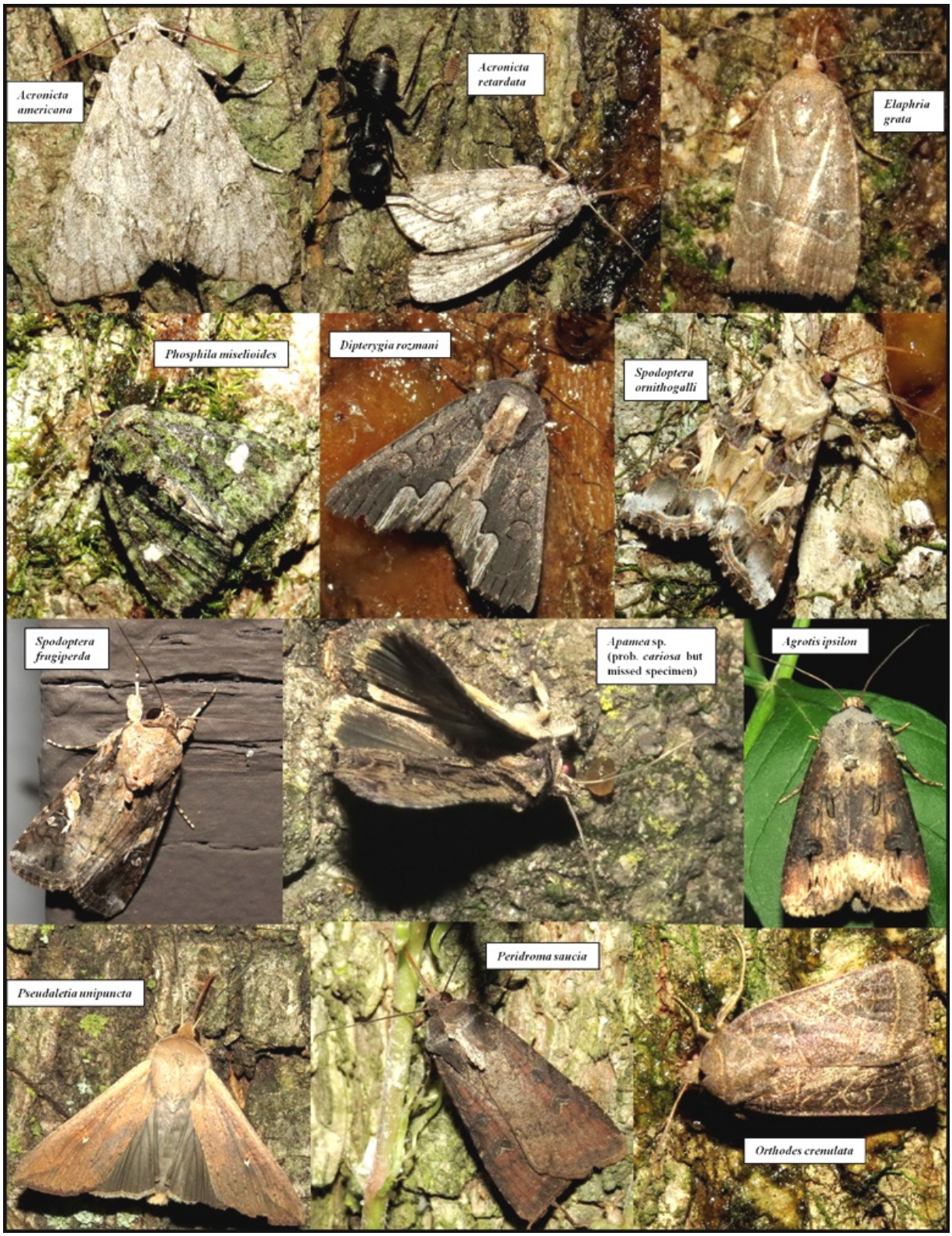

Figure 12: Lepidoptera photographed at the Otter Slough Conservation Area (Noctuidae (part)).

***Agrotis subterranea, Anicla infecta*:** One specimen of each was found at bait during our bioblitz. These species are widespread habitat generalists in the south that migrate northward some years as far as Outagamie County, Wisconsin. We do not know if Otter Slough is within the permanent range or if one or both records represent migrants.

***Peridroma saucia* (Figure 12):** Over 50 individuals were found on the bait trail each night, another 15 were found in bait traps, and a few came to lights. This is a migratory species and one of the most common and widespread habitat generalists in the eastern U.S.

RHOPALOCERA (Butterflies): All species recorded are common and widespread except for Enodia creola. Most of our effort was devoted to nocturnal survey, so the Rhopalocera list for our bioblitz may be relatively incomplete.

***Enodia creola* (Figure 4):** Two individuals were found on the bait trail at dusk and two more were seen in the early morning landed on the ground in hydric hardwood forest. This species is an *Arundinaria* specialist. We could not find *Arundinaria* at Otter Slough, but there must be some in the area for *E. creola* to be present in numbers. A number of moths are *Arundinaria* specialists, including some which are undescribed; however, none of these species were recorded during our bioblitz.

MICROLEPIDOPTERA (Figure 13): Most microlepidoptera families are not our specialty, but we did attempt to collect all the different phenotypes we saw. Much of this material is unidentified and set aside for future study. However, the following families have complete coverage for all species encountered: Psychidae, Attevidae, Sesiidae, Cossidae, and Limacodidae.

Future Study: We hope additional Lepidoptera collecting will be conducted at the Otter Slough Conservation Area in the future. Our limited survey yielded some interesting distributional records, habitat specialists, and a significant contribution to a checklist; however, our list invariably includes just a fraction of the species that occur there. Many univoltine and some multivoltine species would not have been present as adults during our bioblitz, and to approach a thorough list of resident species requires surveys throughout the season. Also, additional species are expected even at the same time of year as our bioblitz. Longer sampling intervals have shown that a two night survey, even with an all night effort with multiple lights and bait, is never sufficient to document all the species present at a given time and place. Our bioblitz was also concentrated on the hydric hardwood forest habitat, whereas the cypress swamp, open marsh, and field habitats received more limited survey.

ACKNOWLEDGMENTS

Steve Buback assisted with the permitting process and provided information about Missouri plants and habitats. George Balogh shared information about his 1985 collecting trip to Otter Slough. Phil Koenig shared portions of his Missouri *Catocala* database. The Missouri Department of Conservation provided us with a wildlife collectors permit. Dan Young and the University of Wisconsin Madison's Department of Entomology provided infrastructural support for dissecting and imaging Lepidoptera genitalia, and Gerry Goth provided a place to stay when we were visiting Madison. Rex Rowan confirmed the identification of the frog species. Hugo and Sharon Kons Sr. and Merla Borth have been supportive of our Lepidoptera research in numerous ways. Lance Durden reviewed this manuscript.

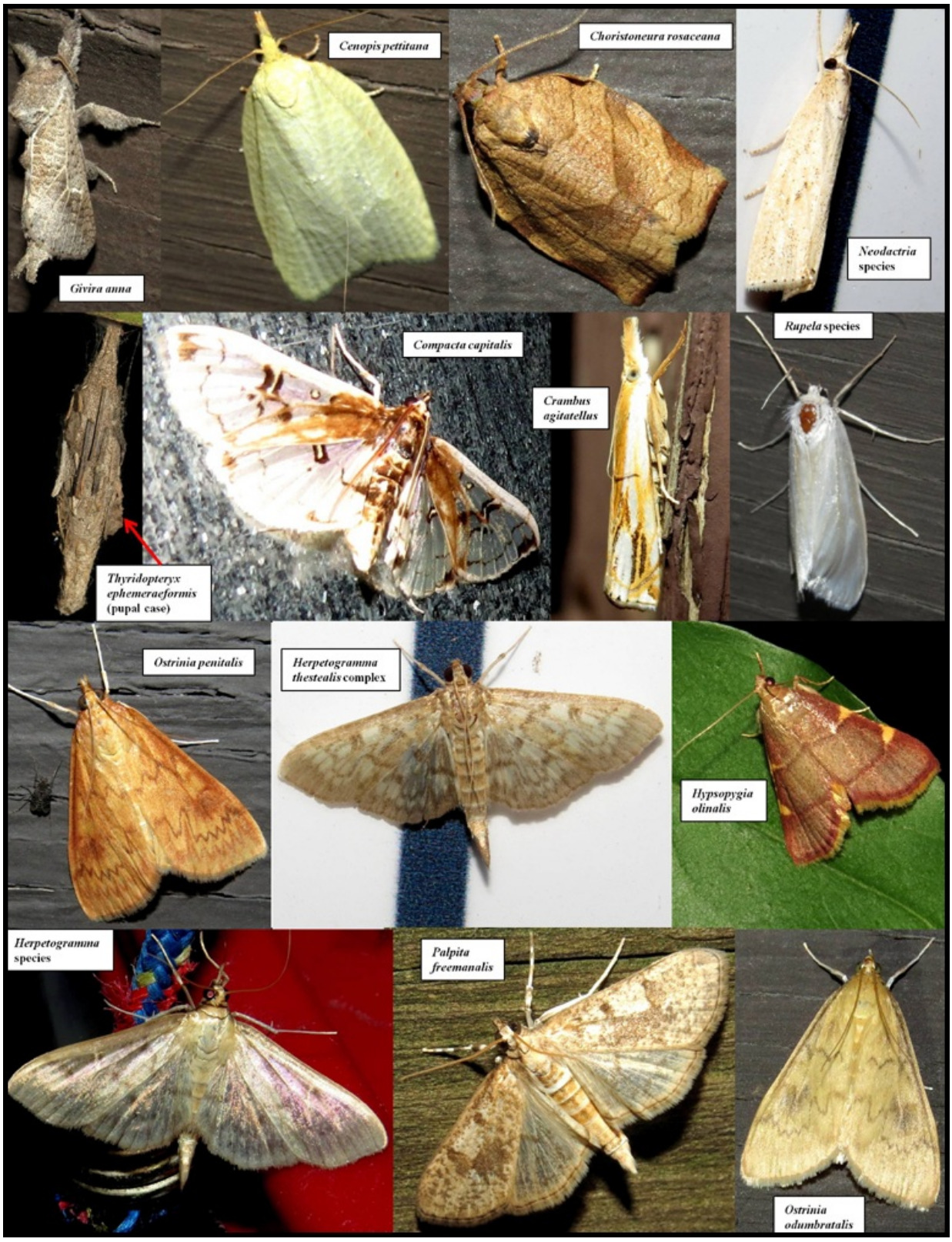

Figure 13: Microlepidoptera photographed at the Otter Slough Conservation Area.

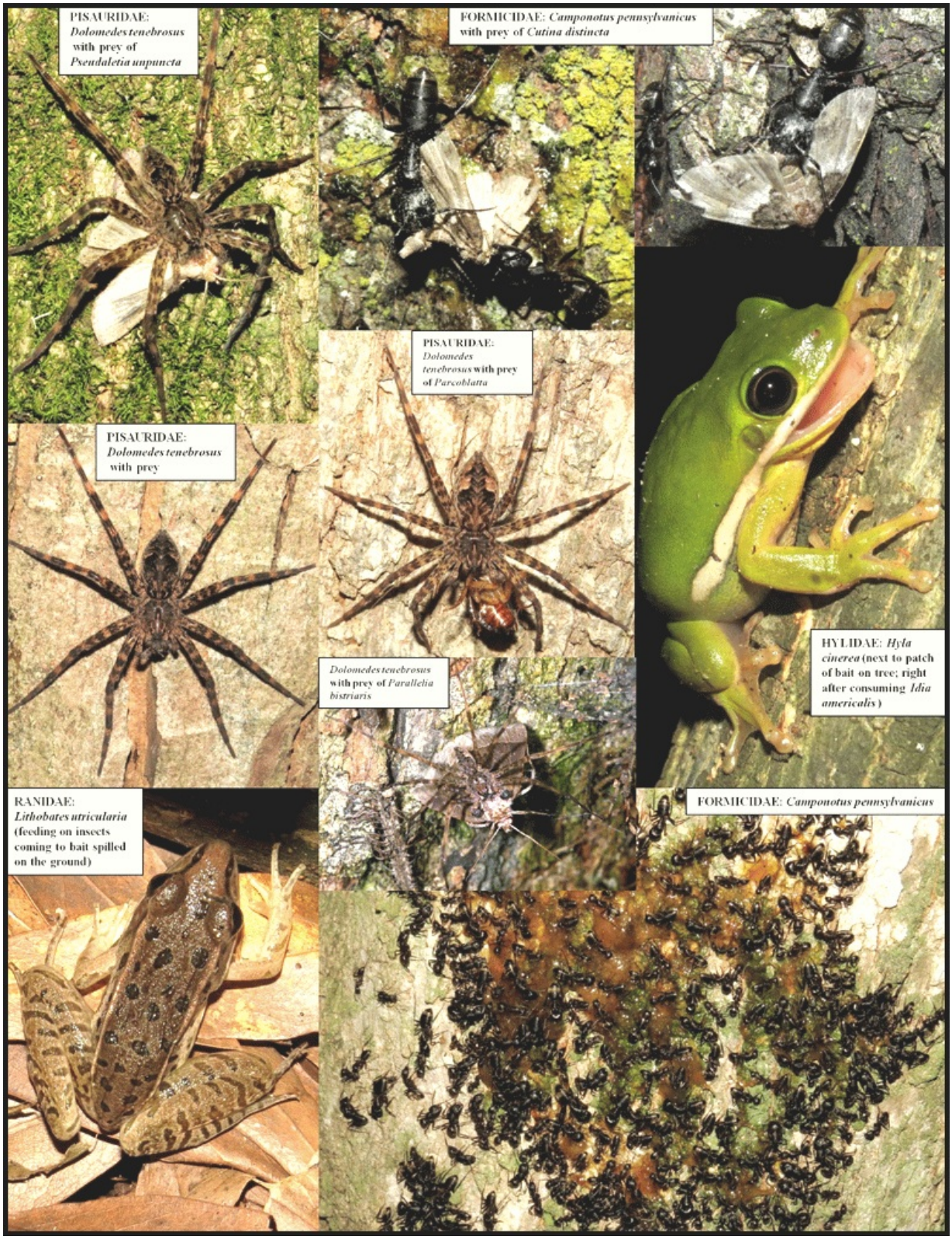

Figure 14: Lepidoptera predators photographed at the Otter Slough Conservation Area.

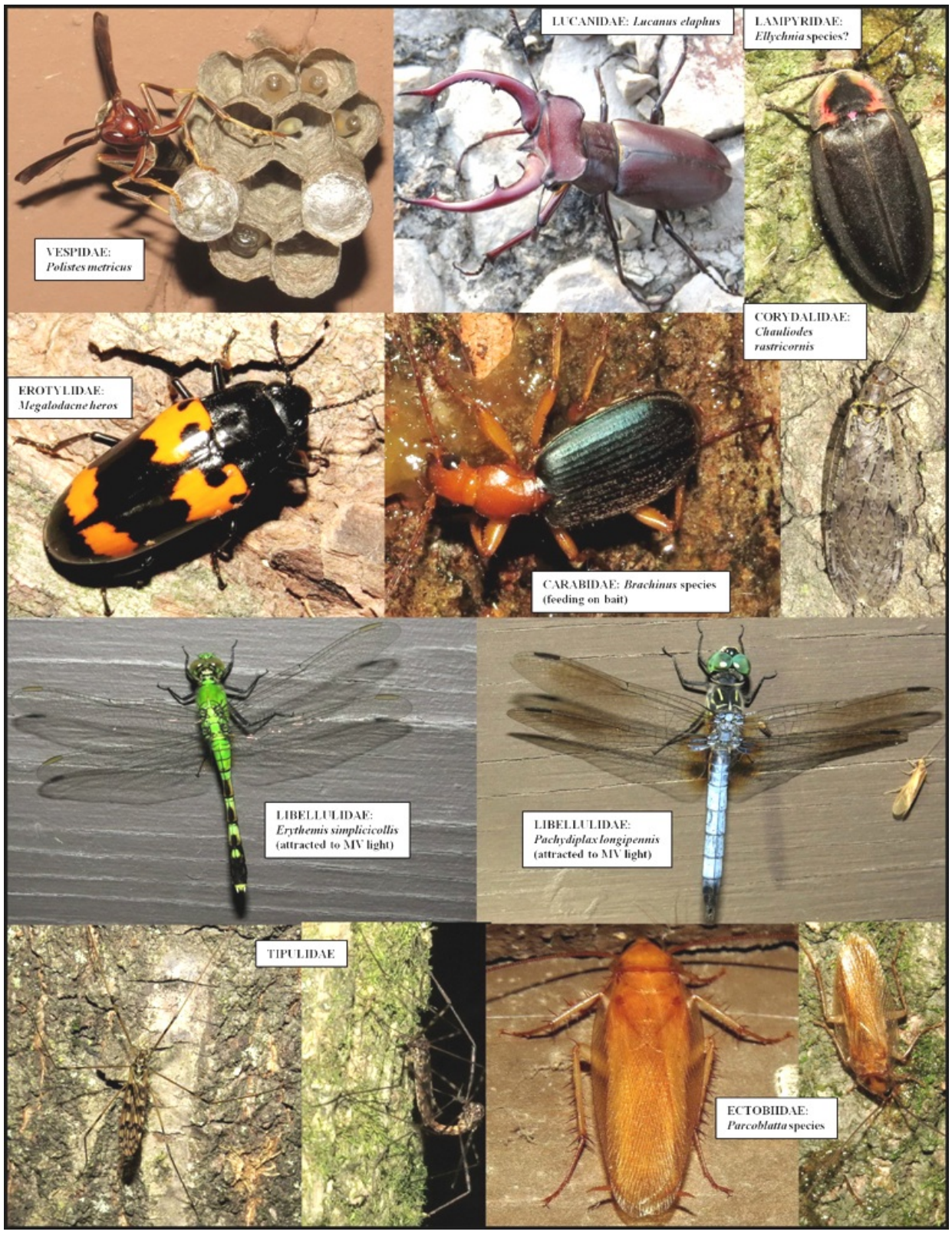

Figure 15: Insects photographed at the Otter Slough Conservation Area.

Figure 16: Selected voucher specimens from the Otter Slough Conservation Area.

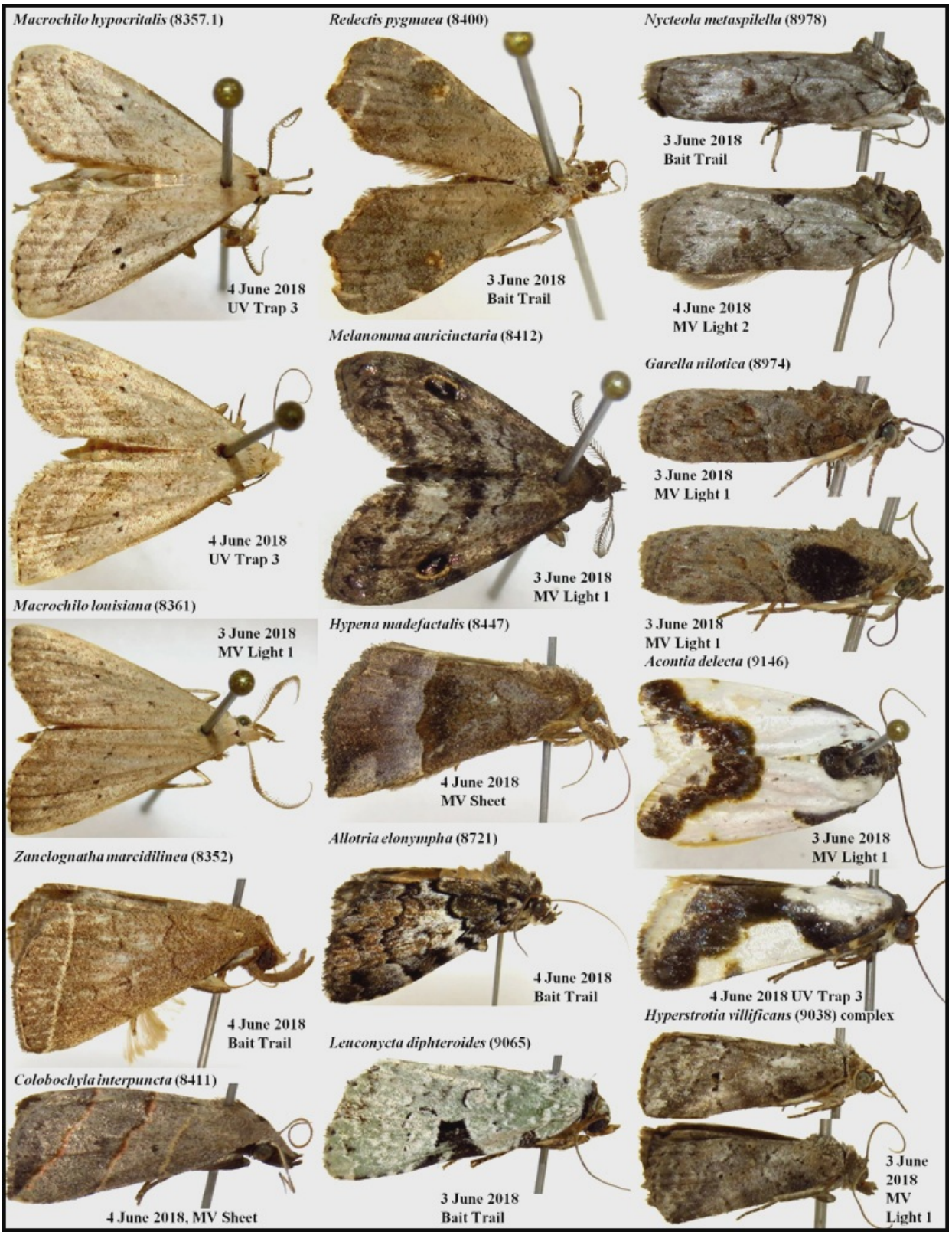

Figure 17: Selected voucher specimens from the Otter Slough Conservation Area.

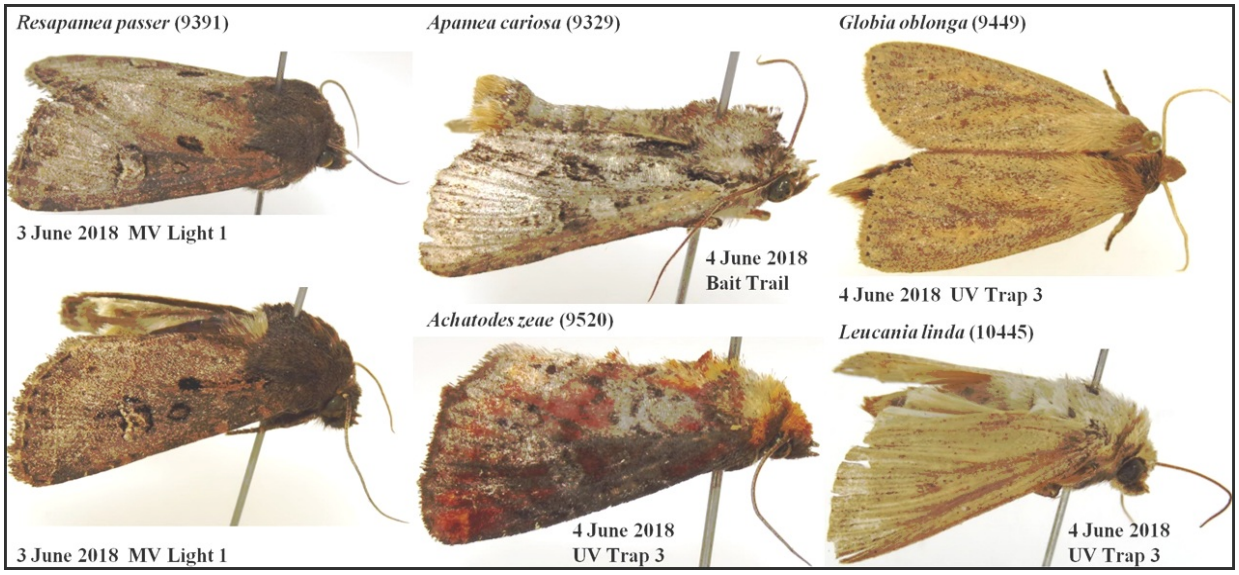

Figure 18: Selected voucher specimens from the Otter Slough Conservation Area.

Table 1: Lepidoptera Survey Dates and Locations for the Otter Slough Conservation Area, Stoddard County, Missouri

Date	Station	Code	Location	Elev. (ft)	E/V	Lat.: ° N	Lon.: ° W	Habitat
3 June 2018	MV Trap 1	OTS:1	Raised platform at the end of the boardwalk	320	E	36.71679	90.11781	Edge of hydric hardwood forest/open grassy wetland with cypress
3 June 2018	UV Trap 2	OTS:2	Hiking trail	325	E	36.72019	90.11392	Hydric hardwood forest near slough
3 June 2018	Bait Trail		Hiking trail through hydric hardwood forest	320-240	From	36.72019	90.11392	Hydric hardwood forest
					To	36.71679	90.11781	Edge of hydric hardwood forest/open grassy wetland with cypress
4 June 2018	MV Sheet	OTS:3	Parking lot by entrance to hiking trail	328	E	36.72049	90.11354	Edge of hydric hardwood forest
4 June 2018	MV Trap 2	OTS:4	Hiking trail through hydric hardwood forest	325	E	36.72019	90.11392	Hydric hardwood forest
4 June 2018	UV Trap 3	OTS:5	Opening W of Conservation Lane	322	E	36.72422	90.10856	Hydric hardwood forest edge/open wetland w. cattails, sedges, cypress
4 June 2018	Bait Trail		Hiking trail through hydric hardwood forest	320-340	V	Same as 3 June 2018		Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71914	90.11456	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71932	90.11439	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71954	90.11434	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71976	90.11426	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.72005	90.11414	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.72036	90.11395	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.72054	90.11376	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71876	90.11607	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71875	90.11586	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71881	90.11559	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71865	90.11539	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.71913	90.11513	Hydric hardwood forest
3-4 June 2018	Bait Trap		Hiking trail through hydric hardwood forest	320-340	E	36.7191	90.11481	Hydric hardwood forest
4 June 2018	Bait Trap		Edge of hydric hardwood forest	322	E	36.71715	90.1163	Edge of hydric hardwood forest
4 June 2018	Bait Trap		Edge of hydric hardwood forest	322	E	36.71698	90.11681	Edge of hydric hardwood forest
3-4 June 2018	Diurnal Ar. A		Grassy opening at edge of hydric hardwood forest	328	V	36.71491	90.11753	Grassy opening adjacent to hydric hardwood forest
3-4 June 2018	Diurnal Ar. B		Hiking Trail through hydric hardwood forest	320-340	V	Same as bait trail		Hydric hardwood forest

Table 2: Lepidoptera Survey Data for Otter Slough Conservation Area from 3-4 June 2018

				MV Light	UV Trap	MV Sheet	MV Light	UV Trap	Bait Trail	Bait Traps	Bait Trail	Diurnal 1	Diurnal 2
LEPIDOPTERA TAXA COLLECTED			Unique Records	3 June 2018	3 June 2018	4 June 2018	4 June 2018	4 June 2018	3 June 2018	3-4 June 2018	4 June 2018	3-4 June; fields	3-4 June; forest
Total documented species in Included families			235	99	43	88	45	63	58	43	46	12	10
RHOPALOCERA			19						2	2	0	10	10
HESPERIOIDEA													
HESPERIIDAE													
Pyrginae													
3870		*Epargyreus clarus*	1										X
3910		*Thorybes pylades*	1									X	
3966		*Pyrgus communis*	1									X	
Hesperiinae													
4078		*Euphyes vestris*	1										X
PAPILIONOIDEA													
PIERIDAE													
4197		*Pieris rapae*	1									X	
4209		*Colias philodice*	1									X	
4210		*Colias eurytheme*	1									X	
LYCAENIDAE													
4299		*Calycopis cecrops*	1										X
4336		*Strymon melinus*	1									X	
4361		*Everes comyntas*	1									X	
4363		*Celastrina ladon* complex	1										X
NYMPHALIDAE													
4420		*Polygonia interrogationis*	2							X			X
4437		*Vanessa atlanta*	1										X
4440		*Junonia coenia*	1									X	
4481		*Phyciodes tharos*	1									X	
4557		*Astereocampa celtis*	3						X	X			X
4562.1		*Astereocampa clyton*	1										X
4568.2		*Enodia creola*	2						X				X
4614		*Danaus plexippus*	2									X	X
MACROLEPIDOPTERA			193	92	43	74	43	62	56	40	46		
GEOMETROIDEA													
GEOMETRIDAE													
Ennominae													
6322		*Mellilla xanthometata*	3	X		X	X						
6326		*Macaria aemulataria*	1			X							
6335		*Macaria aequiferaria*	4	X	X	X	X						
6358		*Digrammia* sp. (*ordinata*?)	1				X?						
6386		*Digrammia ocellinata*	3	X	X	X							
6405		*Digrammia gnophosaria*	3	X	X		X						
6478		*Exelis pyrolaria*	4	X	X	X	X						
6580		*Iridopsis pergracilis*	4	X	X		X	X					
6584		*Iridopsis humaria*	3	X		X		X					
6586		*Iridopsis defectaria*	1				X						
6590		*Anavitrinelia pampinaria*	2	X				X					
6597		*Ectropis crepuscularia*	1	X									
6620		*Melanolophia canadaria*	1					X					
6667		*Lomographa vestaliata*	2			X		X					
6743		*Xanthotype sospeta*	1	X									
6941		*Eusarca confusaria*	2		X			X					
6966		*Eutrapela clemataria*	1				X						
6982		*Prochoerodes lineola*	4	X				X	X	X			
7009		*Nematocampa resistaria*	2		X			X					

Table 2: Lepidoptera Survey Data for Otter Slough Conservation Area from 3-4 June 2018

				MV Light	UV Trap	MV Sheet	MV Light	UV Trap	Bait Trail	Bait Traps	Bait Trail	Diurnal 1	Diurnal 2
LEPIDOPTERA TAXA COLLECTED			Unique Records	3 June 2018	3 June 2018	4 June 2018	4 June 2018	4 June 2018	3 June 2018	3-4 June 2018	4 June 2018	3-4 June; fields	3-4 June; forest
7029		*Nemoria elfa*	2	X			X						
7046		*Nemoria bistriaria*	1			X							
7058		*Synchlora aerata*	2	X			X						
Sterrhinae													
7132		*Pleuroprucha insulsaria*	5	X	X		X	X	X				
7140		*Cyclophora nanaria*	1	X									
7146		*Haematopis grataria*	2	X	X								
7147		*Timandra amaturaria*	4	X	X	X	X						
7159		*Scopula limboundata*	3	X	X			X					
Larentiinae													
7196		*Eulithis diversilineata*	1			X							
7197		*Eulithis gracilineata*	2	X			X						
7390		*Xanthorhoe lacustrata*	1						X				
7414		*Orthonama obstipata*	3	X			X		X				
7416		*Orthonama centrostrigaria*	5	X			X	X	X		X		
7422		*Hydrelia inornata*	1			X							
7440		*Eubaphe mendica*	2			X	X						
7474		*Eupithecia miserulata*	4	X	X			X	X				
BOMBYCOIDEA													
SPHINGIDAE													
Sphinginae													
7783		*Manduca jasminearum*	1			X							
7787		*Ceratomia undulosa*	3	X		X		X					
7791		*Isoparce cupressi*	1	X									
7793		*Paratraea plebeja*	1					X					
7827		*Lathoe juglandis*	1					X					
Macroglossinae													
7870		*Sphecodina abbottii*	1							X			
7873		*Amphion floridensis*	2						X	X			
7885		*Darapsa myron*	2	X						X			
7890		*Xylophanes tersa*	1			X							
NOCTUOIDEA													
NOTODONTIDAE													
7895		*Clostera albosigma*	1			X							
7907		*Datana integerrima*	4	X		X	X	X					
7915		*Nadata gibbosa*	4	X	X		X	X					
7917		*Hyperaeschra georgica*	2	X				X					
7920		*Peridea angulosa*	4	X	X	X		X					
7931		*Gluphisia septentrionis*	1			X							
7937		*Furcula cinerea*	1			X							
7983		*Heterocampa obliqua*	2			X		X					
7985		*Heterocampa subrotata*	1				X						
7994		*Heterocampa guttivitta*	3	X		X		X					
7999		*Lochmaeus bilineata*	3	X	X	X							
8005		*Schizura ipomoeae*	3	X		X		X					
8007		*Schizura unicornis*	2	X		X							
NOCTUIDAE													
Arctiinae													
8045.1		*Crambidia pallida*	2	X				X					
8067		*Cisthene plumbea*	1			X							
8090		*Hypoprepia fucosa*	5	X	X	X	X	X					
8111		*Haploa lecontei*	1	X									

Table 2: Lepidoptera Survey Data for Otter Slough Conservation Area from 3-4 June 2018

				MV Light	UV Trap	MV Sheet	MV Light	UV Trap	Bait Trail	Bait Traps	Bait Trail	Diurnal 1	Diurnal 2
LEPIDOPTERA TAXA COLLECTED			Unique Records	3 June 2018	3 June 2018	4 June 2018	4 June 2018	4 June 2018	3 June 2018	3-4 June 2018	4 June 2018	3-4 June; fields	3-4 June; forest
8818		*Virbia opella*	2	X			X						
8121		*Virbia aurantiaca*	1				X						
8137		*Spilosoma virginica*	1					X					
8140		*Hyphantria cunea*	1				X						
8146		*Hypercompe scribbonia*	1			X							
8169		*Apantesis phalerata*	1					X					
8171		*Apantesis nais*	2		X	X							
8203		*Halysidota tessellaris*	1	X									
8230		*Cycnia tenera*	3		X	X	X						
8238		*Euchaetes egle*	1			X							
8267		*Cisseps fulvicollis*	1	X									
Lymantriinae													
8316		*Orgyia leucostigma*	5	X	X	X	X	X					
Herminiinae													
8322		*Idia americalis*	6	X	X		X		X	X	X		
8323		*Idia aemula*	6	X		X	X		X	X	X		
8326		*Idia rotundalis*	1				X						
8328		*Idia julia*	3	X		X					X		
8333		*Idia denticulalis*	1								X		
8334		*Idia lubricalis* species 1	5		X			X	X	X	X		
8347		*Zanclognatha obscuripennis* species 1	1						X				
8352		*Zanclognatha marcidilinea*	1										
8353		*Zanclognatha ochreipennis*	1								X		
8356		*Chytolita petrealis*	7	X	X	X		X	X	X	X		
8357.1		*Macrochilo hypocritialis*	1	X									
8361		*Macrochilo louisiana*	1	X									
8363		*Phalaenostola eumelusalis*	2	X					X				
8364		*Phalaenostola larentioides*	2	X				X					
8366		*Tetanolita mynesalis*	2			X		X					
8372		*Bleptina sangamonia*	1	X									
8379		*Renia factiosalis*	2	X							X		
8381		*Renia discoloralis*	4	X					X	X	X		
8384.1		*Renia flavipunctalis*	2						X		X		
8386		*Renia adspergillus*	5	X		X			X	X	X		
8397		*Palthis angulalis*	2	X		X							
8398		*Palthis asopialis*	1			X							
8400		*Redectis pygmaea*	3	X					X		X		
8401		*Redectis vitrea*	2	X					X				
Rivulinae													
8404		*Rivula propinqualis*	2	X					X				
Hypenodinae													
8429.1		*Dyspyralis ocala* complex	1	X									
8431		*Schrankia macula*	1	X									
Hypeninae													
8442		*Hypena baltimoralis*	1	X									
8444		*Hypena palparia*	2	X		X							
8447		*Hypena madefactalis*	1			X							
8465		*Hypena scabra*	3	X		X			X				
Unplaced Primitive Quadrifines													
8411		*Colobochyla interpuncta*	3		X	X	X						
8412		*Melanomma auricinctaria*	2	X			X						
8440		*Nigetia formosalis*	7	X	X	X	X		X	X	X		
8479		*Spargaloma sexpunctata*	2						X	X			

Table 2: Lepidoptera Survey Data for Otter Slough Conservation Area from 3-4 June 2018

			MV Light	UV Trap	MV Sheet	MV Light	UV Trap	Bait Trail	Bait Traps	Bait Trail	Diurnal 1	Diurnal 2
LEPIDOPTERA TAXA COLLECTED		Unique Records	3 June 2018	3 June 2018	4 June 2018	4 June 2018	4 June 2018	3 June 2018	3-4 June 2018	4 June 2018	3-4 June; fields	3-4 June; forest
8493	*Isogona tenuis*	3	X		X			X				
Pangraptinae												
8491	*Ledaea perditalis*	2					X			X		
Boletobiinae												
8499	*Metalectra discalis*	5	X				X	X	X	X		
8500	*Metalectra quadrisignata*	3						X	X	X		
Scoleococampinae												
8514	*Scolecocampa liburna*	2					X	X				
Hypocalinae												
8528	*Hyposoropha hormos*	4		X	X	X	X					
Calpinae												
8536	*Calyptra canadensis*	1						X				
Scoliopteryginae												
8555	*Scoliopteryx libatrix*	1								X		
Eulepidotinae												
8587	*Panopoda rufimargo*	1			X							
Erebinae												
8607	*Melipotis jucunda*	1							X			
8689	*Zale lunata*	4					X	X	X	X		
8692	*Zale galbanata*	4		X				X	X	X		
8721	*Allotria elonympha*	1								X		
8726.1	*Dysgonia telma*	1								X		
8727	*Parallelia bistriaris*	3						X	X	X		
8729	*Cutina distincta*	8	X	X	X	X	X	X	X	X		
8738	*Caenurgina crassiuscula*	5	X				X	X	X		X	
8739	*Caenurgina erechtea*	3	X						X		X	
8747	*Celiptera frustulum*	1						X				
8769	*Spiloloma lunilinea*	3						X	X	X		
8801	*Catocala ilia*	4			X		X	X		X		
8857	*Catocala ultronia*	1								X		
	Catocala crataegi complex (S. clade)	4			X			X	X	X		
8874	*Catocala minuta*	3			X			X	X			
Euteliinae												
8955	*Marathyssa inficita*	2	X			X						
Chloephorinae												
8974	*Garella nilotica*	2	X		X							
8978	*Nycteola metaspilella*	3		X		X		X				
Nolinae												
8991	*Nola cereella*	2	X				X					
Unplaced Former Acontiinae												
9038	*Hyperstrotia villificans* complex	4	X	X	X		X					
Eustrotiinae												
9044	*Marimatha nigrofimbria*	2	X				X					
9047	*Protodelte muscosula*	3	X				X		X			
9049	*Maliattha synochitis*	1					X					
9053	*Pseudeustrotia carneola*	6	X	X		X		X	X	X		
9054	*Pseudeustrotia indeterminata*	4					X	X	X	X		
Condicinae												
9690	*Condica videns*	1	X									
9696	*Condica vecors*	4			X			X	X	X		
9699	*Condica sutor*	3						X	X	X		
9714	*Condica confederata*	1								X		
9689	*Perigea xanthioides*	1					X					

Table 2: Lepidoptera Survey Data for Otter Slough Conservation Area from 3-4 June 2018

				MV Light	UV Trap	MV Sheet	MV Light	UV Trap	Bait Trail	Bait Traps	Bait Trail	Diurnal 1	Diurnal 2
LEPIDOPTERA TAXA COLLECTED			Unique Records	3 June 2018	3 June 2018	4 June 2018	4 June 2018	4 June 2018	3 June 2018	3-4 June 2018	4 June 2018	3-4 June; fields	3-4 June; forest
9720		*Ogdoconta cinereola*	7	X	X		X	X	X	X	X		
9057		*Homophoberia apicosa*	5		X	X			X	X	X		
9065		*Leuconycta diphteroides*	2			X			X				
9066		*Leuconycta lepidula*	1						X				
Plusiinae													
8890		*Pseudoplusia includens*	1	X									
8898		*Allagrapha aerea*	5	X	X	X	X	X					
Acontiinae													
9095		*Tarachidia erastrioides*	4	X	X	X	X						
9122		*Spragueia dama*	1					X					
9127		*Spragueia leo*	1					X					
9136		*Acontia aprica*	1	X									
9146		*Acontia delecta*	2	X				X					
Eriopinae													
9630		*Callopistria floridensis*	1	X									
Azenini													
9725		*Azenia obtusa*	3	X		X		X					
Heliothinae													
11068		*Helicoverpa zea*	1	X									
Acronictinae													
9200		*Acronicta americana*	2		X				X				
9238		*Acronicta lobeliae*	1			X							
9242		*Acronicta exilis*	3		X					X	X		
9242,1		*Acronicta immodica*	1			X							
9245		*Acronicta haesitata*	2			X	X						
9251		*Acronicta retardata*	3			X				X	X		
9254		*Acronicta afflicta*	1		X								
9264		*Acronicta longa*	1			X							
8104		*Comachara cadburyi*	3		X	X	X						
Noctuinae													
9619		*Phosphila miselioides*	4		X	X			X		X		
9329		*Apamea cariosa*	1								X		
9391		*Resapamea passer*	1	X									
9404		*Oligia modica*	1								X		
9449		*Globia oblonga*	1					X					
9520		*Achatodes zeae*	1					X					
9433		*Xylomoia chagnoni*	1					X					
9560		*Dypterygia rozmani*	4			X			X	X	X		
9666		*Spodoptera frugiperda*	2		X	X							
9669		*Spodoptera ornithogalli*	4	X	X				X	X			
9679		*Elaphria chalcedonia*	1			X							
9684		*Elaphria grata*	5	X		X	X	X	X				
9688		*Galgula partita*	1	X									
10397		*Lacinipolia renigera*	3				X		X		X		
10438		*Pseudaletia unipuncta*	8	X	X	X	X	X	X	X	X		
10445		*Leucania linda*	1					X					
10585		*Orthodes crenulata*	3					X	X	X			
10640		*Xanthopastis regnatrix*	2			X		X					
10661		*Agrotis malefida*	1			X							
10663		*Agrotis ipsilon*	6	X	X			X	X	X	X		
10664		*Agrotis subterranea*	1							X			
10911		*Anicla infecta*	1								X		
10915		*Peridroma saucia*	6	X		X		X	X	X	X		

Table 2: Lepidoptera Survey Data for Otter Slough Conservation Area from 3-4 June 2018

				MV Light	UV Trap	MV Sheet	MV Light	UV Trap	Bait Trail	Bait Traps	Bait Trail	Diurnal 1	Diurnal 2
LEPIDOPTERA TAXA COLLECTED			Unique Records	3 June 2018	3 June 2018	4 June 2018	4 June 2018	4 June 2018	3 June 2018	3-4 June 2018	4 June 2018	3-4 June; fields	3-4 June; forest
"MICROLEPIDOPTERA" (part)			19										
PSYCHIDAE													
457		*Thyridopteryx ephemeraeformis*	1	Pupal cases only									
GRACILLARIDAE													
644		*Caloptilia violacella*	1	X									
ATTEVIDAE													
2401		*Atteva aurea*	1	X									
SESIIDAE													
2549		*Synanthedon scitula*	1							X			
COSSIDAE													
2668		*Givira anna*	1			X							
2693		*Prionoxystus robiniae*	3	X		X	X						
TORTRICIDAE													
3635		*Choristoneura rosaceana*	1			X							
3725		*Cenopis pettitana*	1			X							
LIMACODIDAE													
4665		*Lithacodes fasciola*	3	X			X	X					
4667		*Apoda y-inversum*	1	X									
PYRALIDAE													
4794		*Eustixia pupula*	1			X							
4946		*Ostrinia penitalis*	1			X							
4947		*Ostrinia odumbratalis*	1			X							
5225		*Palpita freemanalis*	1			X							
5233		*Compacta capitalis*	1	X									
5277		*Herpetogramma thestealis?*	1			X							
		Herpetogramma species	1			X							
		Rupela species	1			X							
5533		*Hypsopygia olinalis*	2	X		X							
5362		*Crambus agitatellus*	1			X							
		Neodactria species	1			X							

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[3] Previous Kons and Borth biodiversity inventory papers included Rhopalocera within the Macrolepidoptera. The latest phylogenetic evidence by Kawahara et al. (2019) provides compelling evidence that the Rhopalocera do not belong in the Macrolepidoptera, but Macrolepidoptera is a natural group with the Rhopalocera removed.

[4] Kawahara et al. (2019) confirms the findings of previous molecular phylogenies that the Hodges et al. (1983) concept of Noctuidae becomes a natural group if the former families Arctiidae and Lymantriidae are down-ranked to subfamilies of Noctuidae. No further nomenclatural changes to the traditional concept of Noctuidae are needed to achieve a natural classification at the family level.

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