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TO UNDERSTANDING THE LEPIDOPTERA FAUNA OF THE SOUTHERN REGION
OF THE UNITED STATES (WEBSITE: www.southernlepsoc.org/)

J. BARRY LOMBARDINI: EDITOR

MIGRANTS, STRAYS, RECENT COLONIZATIONS, AND NEWLY RECORDED
LEPIDOPTERA SPECIES FROM OUTAGAMIE COUNTY, WISCONSIN,
AND ADJACENT AREAS (BY HUGO KONS JR.)



Top Left

Ascalapha odorata (Noctuidae): WI Outagamie County: Mosquito Hill, hill top mesic hardwood forest, bait trail, 24 July 2020.

Top Middle

Utetheisa bella (Noctuidae): WI Outagamie County: Wiouwash Trail just north of Winnebago County border, grassy wetland, 20 October 2017.

Top Right

Callopietria floridensis (Noctuidae): WI Outagamie County: suburban Appleton, West Summer Street, bait trail, 26 July 2018.

Middle

Magusa divaricata (Noctuidae): WI Outagamie County: West Summer Street, bait trail, 15 October 2016.

Bottom Left

Hylephila phyleus (Hesperiidae): WI Outagamie County: Prairie Hill Park, field with prairie planting, 30 September 2022.

Bottom Middle

Hypocala andremona (Noctuidae): WI Shawano County: Navarino Wildlife Area, sandy oak-pine barrens, bait trail, 23 October 2022.

Bottom Right

Anomis illita (Noctuidae): WI Shawano County: Navarino Wildlife Area, bait trail, 24 October 2022.

FIGURES 67-134: Images of Selected Voucher Specimens

All specimens on these plates were photographed by the author, and all are currently deposited in the author's private research collection in Appleton, Wisconsin. Specimens were collected by the author unless otherwise indicated.

FIGURE 67: Western Strays and Ephemeral Migrants.

1. *Dargida procinctus* (10428): WI Outagamie County: Mosquito Hill: prairie planting, bait trail, 1 September 2022.
 2. *Dargida procinctus* (10428): WI Outagamie County: Old Stone Bridge Trail, bait trail, 7 October 2020.
 3. *Dargida procinctus* (10428): WI Outagamie County: Appleton, bait trail, 11 August 2018.
 4. *Diarsia esurialis* (10920): WI Outagamie County: Mosquito Hill: hill top UV trap, 23 August 2022.
 5. *Parabrotis exertistigma* (11047): WI Outagamie County: Appleton: MV trap, 24 July 2016.
 6. *Euxoa auxiliaris* (10731): WI Outagamie County: North Bluemound Drive power line cut: UV trap, 30 September 2019.
 7. *Autographa californica* (8914): WI Shawano County: Navarino Wildlife Area: trail south of Pikes Peak Flowage, bait trail, 9 November 2022.
 8. *Autographa californica* (8914): WI Outagamie County: Appleton, MV trap, 1 August 2019.
 9. *Autographa californica* (8914): WI Outagamie County: Appleton, MV trap, 23 July 2019.
 10. *Autographa californica* (8914): WI Outagamie County: Appleton, bait trail, 21 October 2017.
 11. *Autographa californica* (8914): WI Outagamie County: Appleton, MV trap, 1 October 2017.
 12. *Schinia tertia* (11179): WI Outagamie County: Appleton, nectaring on *Solidago*, 9 September 2015.
 13. *Pyrausta nicalis* (5032): WI Outagamie County: Appleton, MV trap, 9 July 2017.
 14. *Pyrausta pythialis* (5035): WI Shawano County: Navarino Wildlife Area: trail south of Pikes Peak Flowage, UV trap, 10 July 2022.
 15. *Schinia chrysella* (11199): WI Portage County: Schmeekle Reserve, sedge meadow, UV trap, 13 September 1993.
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FIGURE 68: Southern Strays and Ephemeral Migrants (Geometridae).

1. *Macaria promiscuata* (6331): IL DuPage County, Wheaton, MV trap, 14 August 2022.
 2. *Cyclophora packardi* (7136): WI Outagamie County: Fallen Timbers, MV trap, 24 September 2018.
 3. *Iridopsis defectaria* (6586): WI Dane County: Swamplovers Preserve: MV trap, 24 August 2021.
 4. *Macaria aequiferaria* (6335): WI Outagamie County: Appleton: UV lights, 28 August 2022.
 5. *Cyclophora packardi* (7136): WI Shawano County: Navarino Wildlife Area: UV trap, 29 May 2022.
 6. *Glenoides texanaria* (6443): WI Outagamie County: Appleton: MV trap, 9 July 2018.
 7. *Macaria multilineata* (6353): WI Outagamie County: Appleton: MV trap, 3 August 2018.
 8. *Cyclophora nanaria* (7140): WI Outagamie County: Appleton: MV trap, 11 October 2016.
 9. *Macaria granitata* (6352): WI Walworth County, Whitewater Lake Recreation Area campground: UV lights, 9 July 1992.
 10. *Macaria multilineata* (6353): WI Outagamie County: Appleton: MV trap, 31 July 2017.
 11. *Cyclophora nanaria* (7140): WI Outagamie County: Appleton: bait trail, 2 August 2018.
 12. *Coryphista meadii* (7290): WI Outagamie County: Appleton: MV trap, 11 August 2018.
 13. *Rindgea cyda* (6415): WI Ozaukee County: Mequon: MV trap, 7 September 2015.
 14. *Cyclophora nanaria* (7140): WI Outagamie County: Appleton: MV trap, 22 July 2020.
 15. *Coryphista meadii* (7290): WI Outagamie County: Appleton: bait trail, 10 August 2018.
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FIGURE 69: Strays and Ephemeral Migrants (Sphingidae).

1. *Sphinx chersis* (7802): WI Outagamie County: Mosquito Hill: MV sheet, 22 July 2022.
 2. *Ceratomia amyntor* (7786): WI Outagamie County: Mosquito Hill: MV sheet, 22 July 2022.
 3. *Eumorpha achemon* (7861): WI Waukesha County: Highway 67 by Ottawa Lake Recreation Area: nectaring on *Saponaria officinalis*, 25 July 1992.
 4. *Eumorpha pandorus* (7859): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap, 5 August 2022.
 5. *Hyles lineata* (7894): WI Outagamie County: Appleton: UV lights, 13 July 2022.
 6. *Hyles gallii* (7893): WI Outagamie County: Appleton: UV lights, 14 July 2022.
 7. *Sphinx eremitus* (7796): WI Outagamie County: Fallen Timbers: MV trap, 18 June 2021.
 8. *Dolba hyloeus* (7784): WI Outagamie County: Fallen Timbers: nectaring on petunias, 6 August 1992.
 9. *Dolba hyloeus* (7784): WI Outagamie County: Fallen Timbers: MV trap, 18 June 2021.
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FIGURE 70: Southern Strays, Ephemeral Migrants, or Potential Recent Colonizations (Noctuidae: Herminiinae).

1. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 2. *Renia adspersgillis* (8386): WI Shawano County: Navarino Wildlife Area: UV trap, 10 July 2022.
 3. *Bleptina inferior* (8371): WI Outagamie County: Appleton: MV trap, 9 October 2020.
 4. *Tetanolita mynesalis* (8366): WI Outagamie County: Appleton: MV trap, 15 June 2017.
 5. *Tetanolita mynesalis* (8366): WI Shawano County: Navarino Wildlife Area: bait trail, 9 November 2022.
 6. *Tetanolita mynesalis* (8366): WI Outagamie County: Appleton: MV trap, 15 October 2016.
 7. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 8. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 9. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 10. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 11. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 12. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 13. *Renia discoloralis* (8381): WI Outagamie County: Appleton: bait trail, 27 July 2019.
 14. *Renia discoloralis* (8381): WI Outagamie County: Mosquito Hill: bait trail, 5 August 2021.
 15. *Renia discoloralis* (8381): WI Outagamie County: Mosquito Hill: bait trail, 5 August 2021.
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FIGURE 71: Southern Strays, Ephemeral Migrants, or Potential Recent Colonizations (Noctuidae: quadrifines).

1. *Parahyponodes quadralis* (8430): WI Outagamie County: Fallen Timbers: bait trail, 16 July 2020.
 2. *Parahyponodes quadralis* (8430): WI Outagamie County: Mosquito Hill: MV trap, 5 August 2021.
 3. *Parahyponodes quadralis* (8430): WI Outagamie County: Mosquito Hill: floodplain forest/sedge meadow, netted, 5 August 2021.
 4. *Dyspyralis puncticosta* (8427): WI Outagamie County: Fallen Timbers: MV trap, 27 July 2021.
 5. *Hypena minualis* (8457): WI Outagamie County: Appleton: MV trap, 31 October 2016.
 6. *Hypena minualis* (8457): WI Outagamie County: Appleton: UV lights, 31 October 2016.
 7. *Hypena humuli* (8461): WI Outagamie County: Appleton: bait trail, 18 October 2018.
 8. *Hypena humuli* (8461): WI Outagamie County: Old Stone Bridge Trail: bait trail, 18 October 2018.
 9. *Hypena minualis* (8457): WI Shawano County: Navarino Wildlife Area: bait trail, 9 November 2022.
 10. *Anomis illita* (8551): WI Shawano County: Navarino Wildlife Area: bait trail, 24 October 2022.
 11. *Anomis illita* (8551): WI Shawano County: Navarino Wildlife Area: bait trail, 24 October 2022.
 12. *Anomis illita* (8551): WI Outagamie County: Appleton: MV trap, 24 October 2022.
 13. *Tathorhynchus exsiccatus* (8466): WI Outagamie County: Appleton: MV trap, 15 September 2016.
 14. *Anomis erosa* (8545): WI Outagamie County: Appleton: bait trap, 16 September 2015.
 15. *Gabara subnivosella* (8522): WI Outagamie County: Appleton: MV trap, 9 July 2018.
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FIGURE 72: The Tropical Migrant *Anticarsia gemmatalis* (Noctuidae).

1. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 16 October 2016.
 2. *Anticarsia gemmatalis* (8574): WI Shawano County: Navarino Wildlife Area: bait trail, 23 October 2022.
 3. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: MV trap, 18 October 2016.
 4. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 31 October 2016.
 5. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 16 October 2016.
 6. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 19 October 2016.
 7. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 8. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 8 October 2017.
 9. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: MV trap, 17 October 2017.
 10. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 16 October 2016.
 11. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 12. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 19 October 2016.
 13. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 31 October 2016.
 14. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 15. *Anticarsia gemmatalis* (8574): WI Outagamie County: Appleton: bait trail, 8 October 2016.
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FIGURE 73: Southern Strays and Ephemeral Migrants (Noctuidae: Hypocalinae & Erebinae).

1. *Melipotis perpendicularis* (8598): WI Outagamie County: Appleton: UV lights, 8 August 2019.
 2. *Hypocala andremona* (8642): WI Shawano County: Navarino Wildlife Area: bait trail, 23 October 2022.
 3. *Melipotis jucunda* (8607): WI Outagamie County: Appleton: bait trail, 8 August 2018.
 4. *Mocis texana* (8745): WI Outagamie County: Appleton: bait trail, 4 September 2018.
 5. *Matigramma pulverilinea* (8679): WI Dane County: Swamplovers Preserve: MV trap, 24 August 2021.
 6. *Melipotis jucunda* (8607): WI Shawano County: Navarino Wildlife Area: bait trail, 8 September 2022.
 7. *Mocis latipes* (8743): WI Shawano County: Navarino Wildlife Area: bait trail, 24 October 2022.
 8. *Mocis latipes* (8743): WI Shawano County: Navarino Wildlife Area: bait trail, 24 October 2022.
 9. *Mocis latipes* (8743): WI Outagamie County: Appleton: MV trap, 24 August 2016.
 10. *Lesmone detrahens* (8651): WI Outagamie County: Old Stone Bridge Trail: bait trail, 1 September 2018.
 11. *Lesmone detrahens* (8651): WI Outagamie County: Fallen Timbers: bait trail, 5 September 2021.
 12. *Lesmone detrahens* (8651): WI Outagamie County: Old Stone Bridge Trail: bait trail, 1 September 2018.
 13. *Zale bethunei* (8705): WI Walworth County: Whitewater Lake Recreation Area: bait trap, 9 July 1992.
 14. *Allotria elonympha* (8721): WI Waukesha County: Ottawa Lake Campground: UV sheet, 25 July 1992.
 15. *Ptichodis herbarum* (8750): WI Waukesha County: sand prairie/oak savanna west of Highway S: UV sheet, 17 August 1993.
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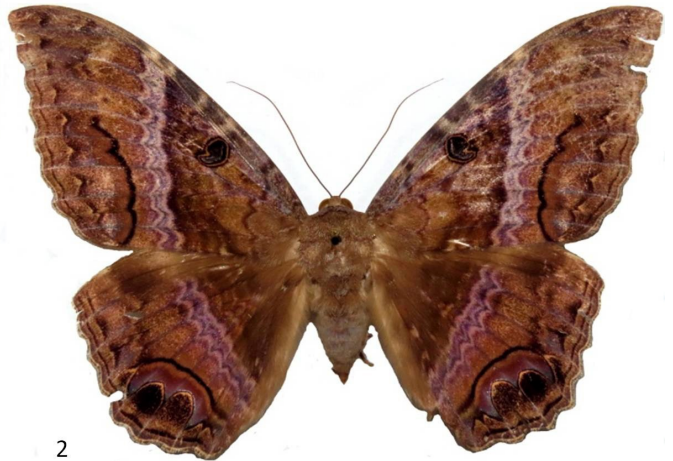


FIGURE 74: The Tropical Migrant *Ascalapha odorata* (Noctuidae).

1. *Ascalapha odorata* (8649): WI Outagamie County: Appleton: bait trap, 25 July 1995.
 2. *Ascalapha odorata* (8649): WI Outagamie County: Appleton: bait trap, 31 July 1991.
 3. *Ascalapha odorata* (8649): WI Outagamie County: Appleton: bait trail, 22 July 2017.
 4. *Ascalapha odorata* (8649): WI Outagamie County: Appleton: bait trail, 21 July 2017.
 5. *Ascalapha odorata* (8649): WI Outagamie County: Mosquito Hill: hill top, bait trail, 10 July 2020.
 6. *Ascalapha odorata* (8649): WI Outagamie County: Mosquito Hill: hill top, bait trail, 24 July 2020.
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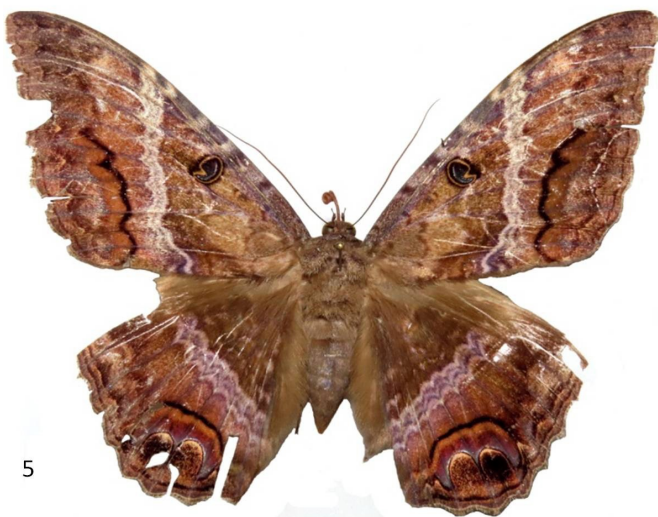
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FIGURE 75: Southern Strays and a Western Ephemeral Resident (Noctuidae: Erebininae: *Catocala*).

1. *Catocala vidua* (8792) {stray}: WI Outagamie County: Mosquito Hill: bait trap, 15 September 1991.
 2. *Catocala maestososa* (8793) {stray}: WI Outagamie County: Appleton: bait trap, 29 August 1991.
 3. *Catocala angusi* (8783) {status uncertain}: WI Dane County: Swamplovers Preserve: MV trap, 17 August 2021.
 4. *Catocala dejecta* (8790) {stray}: WI Crawford County: MV light, 19 July 2013, collected by Steve Bransky (Photo by Robert J. Borth).
 5. *Catocala piatrix* (8771) {stray}: WI Outagamie County: Mosquito Hill: bait trap, 23 August 1994.
 6. *Catocala epione* (8773) {stray}: WI Outagamie County: Mosquito Hill: bait trap, 16 August 1990.
 7. *Catocala junctura* (8770) {stray}: WI Outagamie County: Appleton: bait trap, 3 October 2023.
 8. *Catocala innubens* (8770) {status uncertain}: WI Outagamie County: Mosquito Hill: hill top, MV trap, 24 July 2020.
NOTE: From 1988-1996 I have only two worn specimens from Outagamie County, from Mosquito Hill and Appleton. Recent surveys have yielded five records for Mosquito Hill and four for suburban Appleton. Three fresh individuals were found at Mosquito Hill in 2020 (shown). Other specimens are in fair to worn condition. I have not seen the larval host (honey locust) at Mosquito Hill, although it is planted in the nearby city of New London. Planted honey locust is common in suburban Appleton.
 9. *Catocala innubens* (8770) {status uncertain}: WI Outagamie County: Mosquito Hill: row of trees between east side of prairie planting and field, bait trap, 11 August 1991.
 10. *Catocala innubens* (8770) {status uncertain}: WI Outagamie County: Mosquito Hill: west side of hill, bait trail, 13 August 2020.
 11. *Catocala innubens* (8770) {status uncertain}: WI Outagamie County: Mosquito Hill: west side of hill, bait trail, 24 July 2020.
 12. *Catocala luciana* (8808) {historical, ephemeral resident}: WI Outagamie County: Appleton: bait trap, 29 August 1993.
 13. *Catocala luciana* (8808) {historical, ephemeral resident}: WI Outagamie County: Appleton: bait trap, 16 August 1993.
 14. *Catocala luciana* (8808) {historical, ephemeral resident}: WI Outagamie County: Appleton: bait trap, 2 September 1990.
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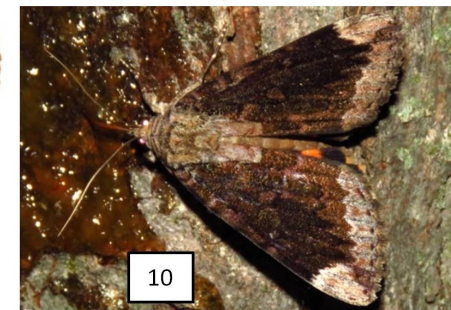


FIGURE 76: Southern Ephemeral Migrants (Noctuidae: Plusiinae).

1. *Rachiplusia ou* (8895): WI Outagamie County: Fox Cities Paper Trail by Fox Valley Technical College: UV trap, 8 October 2021.
 2. *Rachiplusia ou* (8895): WI Outagamie County: Appleton: UV lights, 20 September 2018.
 3. *Rachiplusia ou* (8895): WI Outagamie County: Appleton: UV trap, 21 September 2021.
 4. *Rachiplusia ou* (8895): WI Outagamie County: Fallen Timbers: UV trap, 17 September 2018.
 5. *Rachiplusia ou* (8895): WI Outagamie County: Appleton: bait trail, 26 September 2017.
 6. *Megalographa biloba* (8907): WI Outagamie County: Appleton: bait trail, 7 October 2017.
 7. *Pseudoplusia includens* (8890): WI Outagamie County: Mosquito Hill: prairie planting, MV trap, 3 September 2021.
 8. *Pseudoplusia includens* (8890): WI Outagamie County: Appleton: MV trap, 8 September 2018.
 9. *Pseudoplusia includens* (8890): WI Outagamie County: Appleton: bait trail, 6 September 2018.
 10. *Ctenoplusia oxygramma* (8889): WI Outagamie County: Appleton: UV lights, 17 August 2018.
 11. *Trichoplusia ni* (8887): WI Outagamie County: Appleton: UV lights, 11 August 2018.
 12. *Trichoplusia ni* (8887): WI Outagamie County: Appleton: bait trail, 3 October 2017.
 13. *Ctenoplusia oxygramma* (8889): WI Outagamie County: Appleton: bait trail, 25 September 2018.
 14. *Ctenoplusia oxygramma* (8889): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 15. *Ctenoplusia oxygramma* (8889): WI Outagamie County: Appleton: MV trap, 11 September 2016.
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FIGURE 77: Southern Strays and Ephemeral Migrants (Noctuidae: Eriopinae & Condicinae).

1. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 17 August 2018.
 2. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: MV trap, 12 September 2018.
 3. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 15 August 2018.
 4. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 25 August 2018.
 5. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 12 September 2018.
 6. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: MV trap, 4 September 2020.
 7. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 17 August 2018.
 8. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 23 August 2018.
 9. *Callopietria floridensis* (9630): WI Outagamie County: Appleton: bait trail, 2 October 2021.
 10. *Condica mobilis* (9693): WI Outagamie County: Appleton: bait trail, 27 September 2017.
 11. *Perigea xanthioides* (9689): WI Outagamie County: Mosquito Hill: prairie planting, bait trail, 1 September 2022.
 12. *Condica sutor* (9699): WI Outagamie County: Appleton: bait trail, 11 October 2016.
 13. *Condica sutor* (9699): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 14. *Condica sutor* (9699): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 15. *Condica sutor* (9699): WI Outagamie County: Appleton: bait trail, 11 September 2018.
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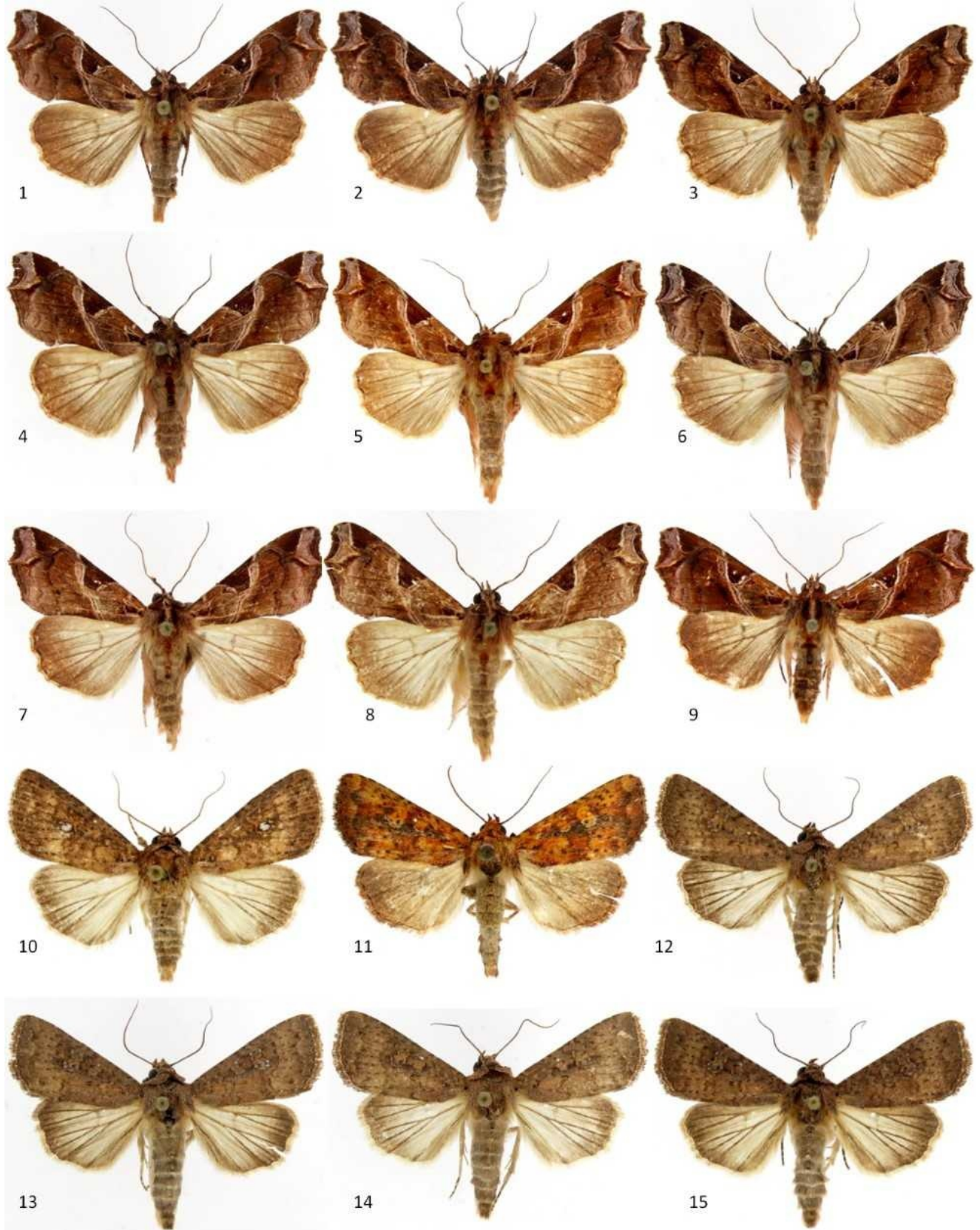


FIGURE 78: Southern Strays and Ephemeral Migrants (Noctuidae).

1. *Garella nilotica* (8974): WI Outagamie County: Appleton: MV trap, 19 June 2017.
 2. *Garella nilotica* (8974): WI Outagamie County: Mosquito Hill: MV trap site 6, 11 July 2021.
 3. *Garella nilotica* (8974): WI Outagamie County: Mosquito Hill: UV trap site 6, 24 July 2020.
 4. *Garella nilotica* (8974): WI Outagamie County: Fallen Timbers: MV trap, 24 September 2018.
 5. *Garella nilotica* (8974): WI Outagamie County: Mosquito Hill: MV trap site 6, 11 July 2021.
 6. *Garella nilotica* (8974): WI Outagamie County: Appleton: MV trap, 16 July 2019.
 7. *Paectes abrostoloides* (8962): WI Outagamie County: Appleton: bait trap, 3 October 2018.
 8. *Paectes abrostoloides* (8962): WI Outagamie County: Appleton: MV trap, 27 August 2018.
 9. *Marimatha nigrofimbria* (9044): WI Outagamie County: Appleton: UV lights, 22 September 2017.
 10. *Hyperstrotia pervertens* (9037): WI Outagamie County: Appleton: MV trap, 10 July 2018.
 11. *Hyperstrotia pervertens* (9037): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
 12. *Oruza albocostaliata*, or species near (9025) {this may represent a disjunct population or separate species rather than a migrant}: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap, 5 August 2022.
 13. *Acronicta clarescens* (9246): WI Outagamie County: Mosquito Hill: hill near top, bait trail, 2 September 2020.
 14. *Tarachidia semiflava* (9085): WI Outagamie County: Mosquito Hill: hill top, UV trap, 18 June 1995.
 15. *Spragueia leo* (9127): WI Outagamie County: Appleton: MV trap, 15 August 2018.
 16. *Acronicta clarescens* (9246): WI Outagamie County: Appleton: bait trap, 10 August 2018.
 17. *Acronicta clarescens* (9246): WI Outagamie County: Appleton: MV trap, 19 June 2019.
 18. *Acronicta clarescens* (9246): WI Outagamie County: Appleton: MV trap, 4 September 2018.
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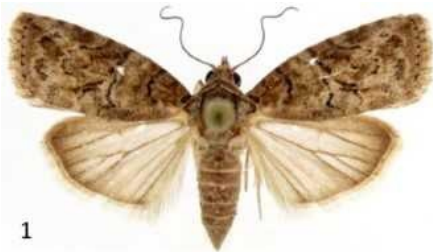


FIGURE 79: Southern Strays and Ephemeral Migrants (Noctuidae).

1. *Amyna stricta* (9070): WI Outagamie County: Appleton: MV trap, 20 September 2016.
2. *Amyna stricta* (9070): WI Outagamie County: Appleton: bait trail, 26 September 2017.
3. *Amyna stricta* (9070): WI Outagamie County: Appleton: MV trap, 12 September 2016.
4. *Amyna bullula* (9069): WI Outagamie County: Appleton: MV trap, 27 September 2018.
5. *Cirrhophanus triangulifer* (9766): WI Outagamie County: Appleton: MV trap, 24 August 2018.
6. *Plagiomimicus spumosum* (9748): WI Dane County: Swamplovers Preserve: MV trap, 24 August 2021.
7. *Schinia obscurata* (11118): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap, 23 June 2022.
8. *Schinia lynx* (11117): WI Outagamie County: Appleton: MV trap, 25 July 2017.
9. *Schinia nundina* (11177): WI Outagamie County: Mosquito Hill: prairie planting near floodplain forest edge, MV trap site 10, 2 September 2020.
10. *Heliothis phloxiphagus* (11072): WI Waupaca County: near Roland Lake, at electric bug zapper, 16 August 1988.
11. *Schinia thoreau* (11141): WI Outagamie County: Appleton: MV trap, 20 July 2019.
12. *Schinia trifascia* (11149): WI Dane County: Swamplovers Preserve: MV trap, 16 August 2021. Note: This species is a resident of this locality. This specimen is shown in lieu of the Outagamie County specimen, which has greased up and thus does not photograph well.
13. *Heliothis virescens* (11071): WI Waukesha County: Ottawa Lake Fen: UV trap, 9 August 1992.
- *14. *Heliothis subflexus* (11070): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
15. *Heliothis subflexus* (11070): WI LaCrosse County: Mississippi River wayside, 1981.

*=Added from recent field work and not included in the text or tables. This specimen is the only record of this southern migrant from the Outagamie County area.



FIGURE 80: Southern Ephemeral Migrants (Noctuidae: Noctuinae).

1. *Apamea cristata* (9331): WI Outagamie County: Appleton: bait trap, 8 July 2018.
 2. *Apamea cristata* (9331): WI Shawano County: Navarino Wildlife Area: UV sheet, 22 June 2022.
 3. *Apamea cristata* (9331): WI Outagamie County: Mosquito Hill: hill near summit, UV trap site 24, 22 July 2022.
 4. *Apamea vulgaris* (9332): Dissection Voucher Number HLK:2714: WI Outagamie County: Appleton: bait trap, 13 June 2021.
 5. *Bellura densa complex species 1* (9526): WI Outagamie County: Appleton: MV trap, 16 August 2020.
 6. *Papaipema beeriana* (9508): WI Outagamie County: Fallen Timbers: UV trap, 1 September 1995.
 7. *Spodoptera eridania* (9672): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 8. *Spodoptera dolichos* (9671): WI Outagamie County: Appleton: bait trap, 16 October 2016.
 9. *Spodoptera dolichos* (9671): WI Outagamie County: Fallen Timbers: bait trap, 7 October 1995.
 10. *Achatodes zeae* (9520): WI Outagamie County: Appleton: bait trail, 11 July 2018.
 11. *Achatodes zeae* (9520): WI Outagamie County: Appleton: MV trap, 13 July 2020.
 12. *Achatodes zeae* (9520): WI Outagamie County: Mosquito Hill: bait trail, 18 July 2021.
 13. *Magusa divaricata* (9637): WI Outagamie County: Appleton: bait trail, 17 August 2018.
 14. *Trachea delicata* (9626): WI Winnebago County: Winneconne: Breezewood Lane: lighted sheet, 25 August 1990.
 15. *Elaphria chalcedonia* (9679): WI Outagamie County: Appleton: bait trail, 16 October 2016.
-

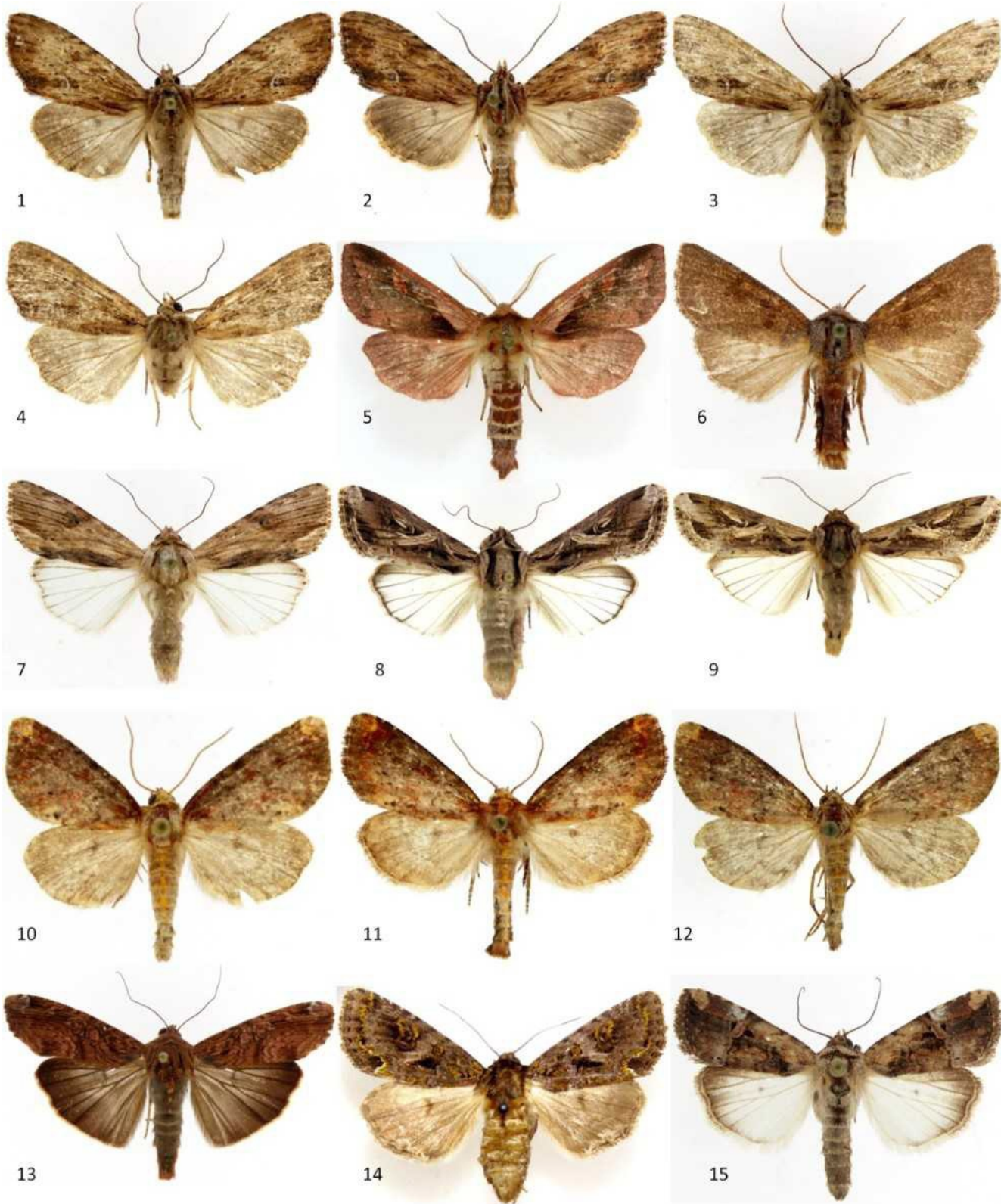


FIGURE 81: The Tropical Migrant *Magusa divaricata* (9637) (Noctuidae).

1. WI Outagamie County: Appleton: bait trail, 9 August 2018.
 2. WI Outagamie County: Appleton: bait trail, 6 October 2017.
 3. WI Outagamie County: Appleton: bait trail, 3 October 2017.
 4. WI Outagamie County: Appleton: bait trail, 8 August 2018.
 5. WI Outagamie County: Appleton: bait trail, 8 October 2018.
 6. WI Outagamie County: Appleton: MV trap, 12 August 2018.
 7. WI Outagamie County: Appleton: MV trap, 3 October 2017.
 8. WI Outagamie County: Appleton: bait trail, 23 August 2018.
 9. WI Outagamie County: Appleton: bait trail, 6 October 2017.
 10. WI Outagamie County: Appleton: bait trail, 15 August 2018.
 11. WI Outagamie County: Appleton: bait trail, 15 August 2018.
 12. WI Outagamie County: Appleton: bait trail, 19 August 2018.
 13. WI Outagamie County: Appleton: MV trap, 16 September 2018.
 14. WI Outagamie County: Appleton: bait trail, 15 August 2018.
 15. WI Outagamie County: Appleton: UV lights, 30 September 2017.
 16. WI Outagamie County: Appleton: bait trail, 15 August 2018.
 17. WI Outagamie County: Appleton: bait trail, 15 August 2018.
 18. WI Outagamie County: Appleton: MV trap, 26 September 2017.
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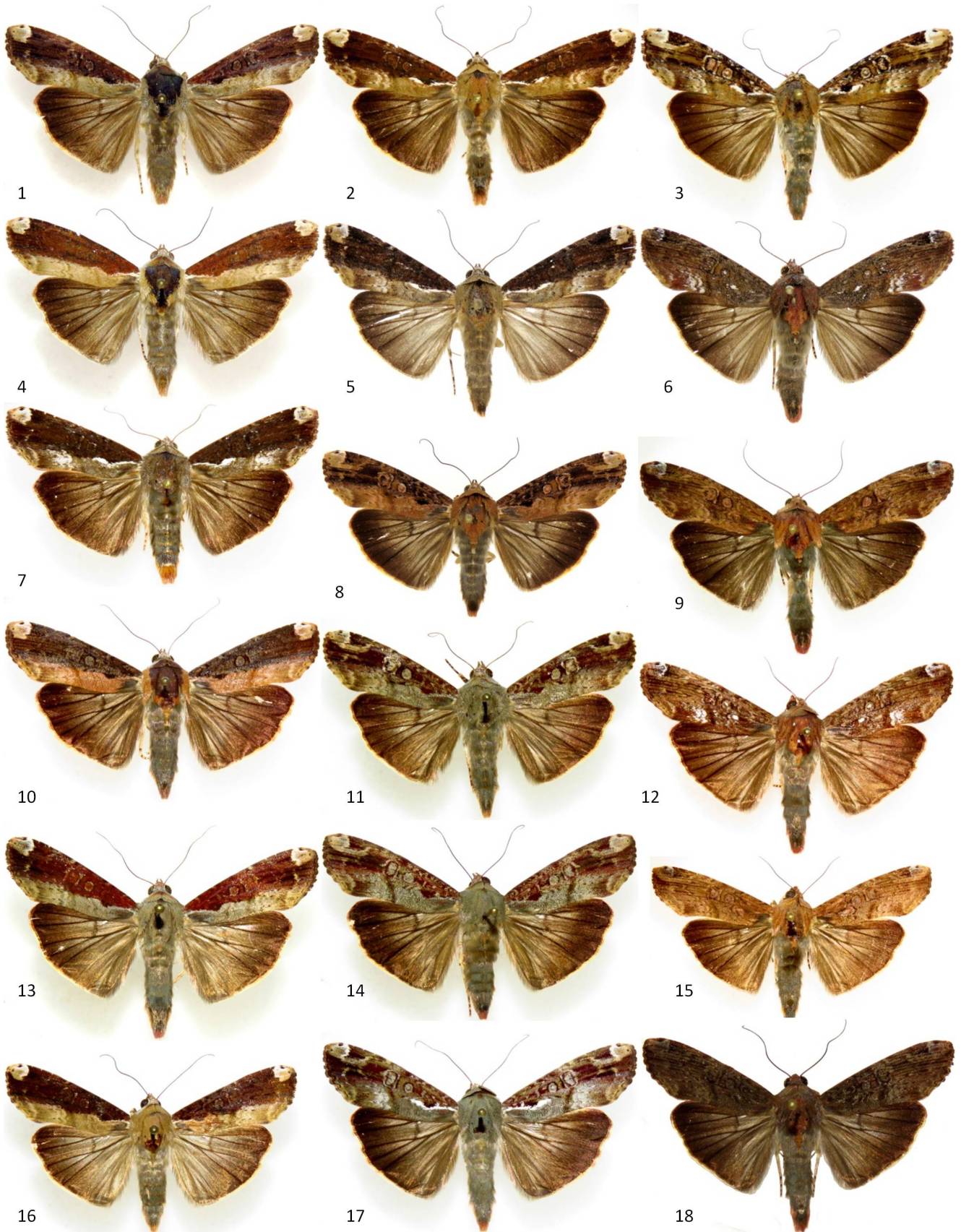


FIGURE 82: Southern Strays and Ephemeral Migrants (Noctuidae: Noctuinae).

1. *Leucania adjuta* (10456): WI Outagamie County: Appleton: bait trail, 20 October 2017.
 2. *Leucania adjuta* (10456): WI Outagamie County: Appleton: bait trail, 6 October 2017.
 3. *Leucania adjuta* (10456): WI Outagamie County: Appleton: bait trail, 6 October 2017.
 4. *Leucania adjuta* (10456): WI Outagamie County: Fallen Timbers: bait trail, 9 October 2021.
 5. *Leucania ursula* (10461): WI Dane County: Swamplovers Preserve: MV trap, 16 August 2021.
[Apparently now established as a resident at this locality]
 6. *Leucania ursula* (10461): Same specimen as Number 5, underside.
 7. *Sericaglaea signata* (9941): WI Shawano County: Navarino Wildlife Area: bait trail, 24 October 2022.
 8. *Agrotis subterranea* (10664): WI Outagamie County: Appleton: bait trail, 22 October 2017.
 9. *Agrotis subterranea* (10664): WI Outagamie County: Appleton: bait trail, 21 October 2017.
 10. *Anicla infecta* (10911): WI Outagamie County: Old Stone Bridge Trail: bait trail, 9 October 2020.
 11. *Anicla infecta* (10911): WI Winnebago County: Wiouwash Trail just south of county line, sedge meadow, UV trap, 8 October 2021.
 12. *Anicla infecta* (10911): WI Outagamie County: Appleton: bait trail, 6 October 2020.
 13. *Anicla infecta* (10911): WI Outagamie County: Old Stone Bridge Trail: bait trail, 14 October 2020.
 14. *Anicla infecta* (10911): WI Outagamie County: Appleton: UV lights, 19 August 2016.
 15. *Anicla infecta* (10911): WI Outagamie County: Old Stone Bridge Trail: bait trail, 18 October 2018.
-



FIGURE 83: 1-16: Southern Strays or Poorly Documented Species of Unknown Status; 17-18: Annual Migrants with Deformed Wings.

1. *Misogoda unicolor* (7974): WI Dane County: Swamplovers Preserve: MV Trap, 24 August 2021.
 2. *Dasychira tephra* (8292): WI Dane County: Swamplovers Preserve: MV Trap, 15 August 2021.
 3. *Haploa clymene* (8107): WI Kenosha County: Chiwaukee Prairie, UV sheet, 18 August 1993.
 4. *Tetanolita near palligera* (8367.1): WI Outagamie County: Appleton: UV lights, 30 August 1995.
 5. *Renia adspersgillis* (8386): WI Outagamie County: Appleton: UV lights, 14 July 1996.
 6. *Renia salusalis* species 2 (8378): WI Waukesha County: Ottawa Lake Campground: mesic hardwood forest/fields, UV sheet, 13 July 1993.
 7. *Meganola phylla* (8983.1): WI Waukesha County: Sand Prairie West of Highway S: UV sheet, 26 July 1993.
 8. *Meganola phylla* (8983.1): WI Outagamie County: Mosquito Hill: UV lights on hill top, 30 July 1995.
 9. *Oruza albocostaliata*, or species near (9025): WI Jackson County: Kling Road: upland oak-pine forest with barrens openings, UV trap, 3 July 1993.
 10. *Ozarba aeria* (9030): WI Dane County: Swamplovers Preserve: MV Trap, 23 August 2021.
 11. *Acontia aprica* (9136): WI Kenosha County: Chiwaukee Prairie, UV trap, 28 July 1993.
 12. *Acontia terminimaculata* species complex (9145): WI Outagamie County: Mosquito Hill: UV lights on hill top, 21 July 1992.
 13. *Homophoberia cristata* (9056): WI Waukesha County: Ottawa Lake Fen: UV trap, 25 July 1992.
 14. *Polygrammate hebraicum* (9285): WI Waukesha County: Sand Prairie West of Highway S: UV sheet, 13 August 1993.
 15. *Iodopepla u-album* (9522): WI Kenosha County: Chiwaukee Prairie: UV trap, 18 August 1993.
 16. *Apamea vulgaris* (9332): WI Outagamie County: Appleton: 9 June 1991.
 17. *Pseudaletia unipuncta* (10438): WI Outagamie County: Appleton: MV trap, 16 August 2018.
 18. *Agrotis ipsilon* (10663): WI Outagamie County: Old Stone Bridge Trail: bait trail, 10 October 2020.
-



FIGURE 84: Rare Southern Strays or Accidentals Recorded from Outagamie County or Elsewhere in Eastern Wisconsin (Geometridae & Noctuidae).

1. *Psamatodes abydata* (6332): WI Outagamie County: Appleton: MV trap, 15 August 2017.
2. *Dichorda iridaria* (7053): WI Outagamie County: Appleton: lighted sheet, 18 July 1991.
3. *Lobocleta ossularia* (7094): WI Outagamie County: Appleton: MV trap, 8 October 2018.
- *4. *Idaea violacearia* (7120): WI Outagamie County: Appleton: UV lights, 30 May 2023.
Note: Remarkably, this specimen looks like a geographic variant found in southeastern Texas.
5. *Nola cereella* (8991): WI Outagamie County: Appleton: MV trap, 8 September 2015.
6. *Cisthene plumbea* (8067): WI Outagamie County: Appleton: MV trap, 14 September 2015.
7. *Redectis vitrea* (8401): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap 10, 2 September 2020.
8. *Idia denticulalis* (8333): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 25 July 2020.
9. *Idia scobialis* (8330): WI Waukesha County: Ottawa Lake Fen: fen and sedge meadow along lake margin, adjacent to hydric to mesic hardwood forest, bait trap, 9 August 1992.
10. *Bleptina sangamonia* (8372)?: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap 10, 4 August 2021.
Note: This specimen should be dissected due to its worn condition. An undescribed species similar to *sangamonia* occurs in Oklahoma and Texas, and I do not know if it strays or migrates north.
11. *Palthis asopialis* (8398): WI Outagamie County: Appleton: MV trap, 9 September 2015.
12. *Nigetia formosalis* (8440): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap 10, 2 September 2020.
13. *Sigela brauneata* (8432): WI Outagamie County: Appleton: MV trap, 8 October 2018.
14. *Colobochyla interpuncta* (8411): WI Outagamie County: Appleton: MV trap, 8 September 2015.
15. *Hemeroplanis scopulepes complex species 1* (8467): WI Outagamie County: Appleton: MV trap, 20 September 2015.
16. *Metalectra tantillus* (8502): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 25 July 2020.
- *17. *Arugisa lutea* (8509): WI Outagamie County: Appleton: UV lights, 26 June 2023.
18. *Hypsoropha hormos* (8528): WI Outagamie County: Appleton: MV trap, 26 June 2019.

*=This record was added from recent field work and is not included in the species account.



FIGURE 85: Rare Southern Strays or Accidentals Recorded from Outagamie County or Elsewhere in Eastern Wisconsin (Noctuidae).

1. *Melipotis jucunda* (8607): WI Outagamie County: Appleton: MV trap, 8 July 2018.

Note: This specimen looks like a southwestern phenotype, whereas the other two records are a typical southeastern phenotype.

2. *Melipotis indomita* (8600): WI Outagamie County: Appleton: bait trap, 9 July 2018.

3. *Bulia deducta* (8614): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest along the south side of the hill, MV sheet 6, 9 June 2023.

4. *Caenurgia chloropha* (8733): WI Outagamie County: Appleton: MV trap, 8 September 2015.

5. *Alabama argillacea* (8554): WI Outagamie County: Appleton: 1981.

6. *Zale aeruginosa* species 2 (8694): WI Outagamie County: Appleton: July-September 2011, Hugo Kons Sr.

7. *Paectes pygmaea* (8959): WI Outagamie County: Appleton: MV trap, 17 July 2016.

8. *Hyperstrotia flavigutta* (9039): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap 10, 2 September 2020.

9. *Tripudia rectangula* (9003.1): WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 24 August 2021.

10. *Acontia aprica* (9136): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 23 August 2022.

11. *Schinia jaguarina* (11132): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest along the south side of the hill, MV trap 6, 10 July 2020.

12. *Schinia bifascia* (11142): WI Outagamie County: Fallen Timbers: field with prairie planting/hydric hardwood forest edge, MV trap 1, 17 September 2018.

13. *Phosphila turbulenta* (9618): WI Waukesha County: Ottawa Lake Campground: mesic hardwood forest/field, UV sheet, 25 July 1992.

14. *Micrathetis triplex* (9644): WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 10 July 2020.

15. *Properigea costa* (9589): WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 10 July 2020.

NOTE: This specimen looks like the typical phenotype of southwestern Oklahoma and Missouri.

16. *Himella fidelis* (10502): WI Portage County, Emmons Creek Public Hunting Area: oak-pine barrens, UV sheet, 11 May 1993.

17. *Agrotis maldefida* (10661): WI Outagamie County: Appleton: bait trap, 8 July 2018.

18. *Choephora fungorum* (10998): WI Kenosha County: Visitor Center: flushed from field during day, 3 October 2023.

NOTE: This might be a resident rather than a stray. It is established as far north as Wheaton, IL (DuPage County).



FIGURE 86: Southern Strays and Ephemeral Migrants (Tineidae, Depressaridae, Plutellidae, Ypsolophidae, Choreutidae, Tortricidae, and Epipyropidae).

1. *Acrolophus popeanella* (373): WI Outagamie County: Appleton: UV lights, 21 August 2022.
2. *Gonioterma mistrella* (1032): WI Outagamie County: Appleton: UV sheet, 31 August 2022.
3. *Rhyacionia buoliana* (2867): (3630): WI Outagamie County: Appleton: MV trap, 1 July 2017.
4. *Acrolophus propinqua* (374): WI Outagamie County: Appleton: UV lights, 22 August 2022.
- *5. *Plutella porrectella* (2363): WI Outagamie County: Appleton: UV lights, 14 July 2023.
6. *Cydia garcana* (3457): WI Outagamie County: Appleton: MV trap, 6 July 2017.
7. *Acrolophus texanella* (383): WI Outagamie County: Appleton: MV trap, 5 September 2016.
8. *Plutella porrectella* (2363): WI Outagamie County: Appleton: MV trap, 14 June 2022.
9. *Diedra cockerellana* (3630): WI Outagamie County: Appleton: MV trap, 25 September 2017.
10. *Acrolophus morus* (367): WI Outagamie County: Appleton: UV lights, 27 September 2018.
11. *Ypsolopha barberella* (2370): WI Outagamie County: Appleton: MV trap, 16 May 2018.
12. *Atroposia oenotherana* (3842): WI Outagamie County: Appleton: MV trap, 20 August 2018.
13. *Acrolophus morus* (367): WI Outagamie County: Appleton: UV lights, 21 September 2017.
14. *Prochoreutis inflatella* (2629): WI Outagamie County: Fallen Timbers: MV trap, 18 June 2021.
15. *Atroposia oenotherana* (3842): WI Outagamie County: Appleton: MV trap, 16 August 2016.
16. *Ethmia zelleriella* (992): WI Outagamie County: Appleton: MV trap, 10 June 2017.
17. *Eumarozia malachitana* (2749): WI Outagamie County: Appleton: UV lights, 5 May 2018.
18. *Fulgoraecia exigua* (4701): WI Dane County: Swamplovers Preserve, MV trap, 24 August 2021.

*=Added from recent field work and not included in the text or tables.

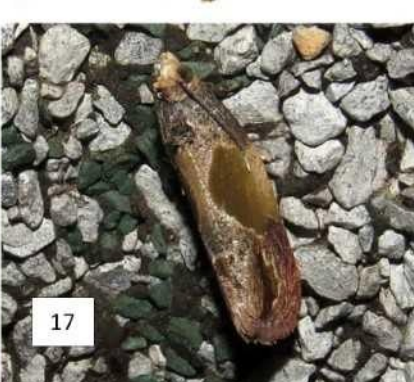


FIGURE 87: Southern Strays and Migrants (Pyrallidae).

1. *Dicymolomia julianalis* (4889): WI Outagamie County: Appleton: MV trap, 20 June 2017.
 2. *Chalcoela iphitalis* (4895): WI Outagamie County: Appleton: MV trap, 18 June 2019.
 3. *Hahncappsia mancalis* (4967): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 4 September 2018.
 4. *Hahncappsia* species, *pergilvalis* (4968)?: WI Outagamie County: Appleton: UV trap, 31 August 2021.
 5. *Achyra rantalis* (4975): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 5 September 2019.
 6. *Achyra rantalis* (4975): WI Outagamie County: Appleton: bait trail, 5 September 2018.
 7. *Uresiphita reversalis* (4992): WI Outagamie County: Mosquito Hill: 22 August 1994.
 8. *Pyrausta tyralis* (5069): WI Dane County: Swamplovers Preserve: MV trap, 14 August 2021.
 9. *Pyrausta subsequalis* (5060): WI Outagamie County: Appleton: UV lights, 1 August 2017.
 10. *Pyrausta inveterascalis* (5036): WI Outagamie County: Appleton: MV trap, 27 August 2020.
 11. *Udea rubigalis* (5079): WI Outagamie County: Appleton: MV trap, 5 September 2020.
 12. *Lineodes integra* (5107): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 13. *Ategumia ebulealis* (5158): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 14. *Udea rubigalis* (5079): WI Shawano County: Navarino Wildlife Area: bait trail, 20 November 2020.
 15. *Apoggesha stenialis* (5177): WI Outagamie County: Appleton: MV trap, 30 June 2017.
-



FIGURE 88: Southern Strays and Migrants (Pyrilidae).

1. *Hymenia perspectalis* (5169): WI Outagamie County: Appleton: bait trail, 8 October 2017.
 2. *Hymenia perspectalis* (5169): WI Outagamie County: Fallen Timbers: MV trap, September 2018.
 3. *Spoladea recurvalis* (5170): WI Outagamie County: Appleton: MV trap, 11 October 2016.
 4. *Diasemioides janassialis* (5172): WI Outagamie County: Fallen Timbers: UV trap 26, 18 September 2022.
 5. *Diaphania hyalinata* (5204): WI Outagamie County: Appleton: bait trail, 26 September 2017.
 6. *Nomophila nearctica* (5156): WI Outagamie County: Appleton: UV lights, 21 May 2019.
 7. *Patania silicanis* (5243): WI Outagamie County: Mosquito Hill: hillside bait trail, 9 November 2020.
 8. *Palpita quadristigmalis* (5218): WI Outagamie County: Appleton: bait trail, 8 August 2018.
 9. *Diastictis ventralis* (5255): WI Burnett County: Namekogan Barrens: T42N R 14W Sec 1, UV light, 19 June 1996.
 10. *Herpetogramma bipunctalis* (5272): WI Outagamie County: Mosquito Hill: prairie planting, nectaring on *Helianthis giganteus*, 15 September 2020.
 11. *Herpetogramma bipunctalis* (5272): WI Outagamie County: Appleton: MV trap, 7 September 2016.
 12. *Pilocrocis ramentalis* (5281): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 13. *Herpetogramma bipunctalis* (5272): WI Outagamie County: Appleton: MV trap, 8 November 2016.
 14. *Herpetogramma phaeopteralis* (5274): WI Outagamie County: Appleton: MV trap, 11 October 2016.
 15. *Pilocrocis ramentalis* (5281): WI Outagamie County: Appleton: bait trail, 26 September 2017.
-



FIGURE 89: Southern Strays and Migrants (Pyrilidae).

1. *Psara obscuralis* (5268): WI Outagamie County: Appleton: MV trap, 10 August 2018.
 2. *Platytes vobisne* (5394): WI Outagamie County: Appleton: MV trap, 14 July 2019.
 3. *Agriphila ruricolellus* (5399): WI Outagamie County: Appleton: MV trap, 25 August 2020.
 4. *Agriphila ruricolellus* (5399): WI Outagamie County: Appleton: MV trap, 22 August 2018.
 5. *Agriphila vulgivagellus* (5403): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 2 September 2018.
 6. *Euchromius ocella* (5454): WI Shawano County: Navarino Wildlife Area: sedge meadow along stream, UV trap 23, 2 November 2022.
 7. *Euchromius ocella* (5454): WI Outagamie County: Mosquito Hill: prairie planting, UV trap 26, 1 October 2022.
 8. *Pococera humerella* (5617): WI Dane County: Swamplovers Preserve: MV trap, 21 August 2021.
 9. *Galleria mellonella* (5622): WI Outagamie County: Appleton: UV lights, 21 September 2017.
 10. *Achoria grisella* (5623): WI Outagamie County: Appleton: MV trap, 5 September 2016.
 11. *Eustixia pupula* (4794): WI Outagamie County: Appleton: MV trap, 8 July 2018.
 12. *Microtheoris ophionalis* (4796): WI Outagamie County: Appleton: MV trap, 7 July 2018.
 13. *Hellula rogatalis* (4846): WI Outagamie County: Appleton: MV trap, 16 September 2015.
 14. *Pyrausta onythesalis* (5042): WI Outagamie County: Appleton: MV trap, 27 August 2017.
 15. *Pyrausta rubricalis* (5051): WI Outagamie County: Appleton: MV trap, 29 August 2017.
 16. *Pyrausta laticlavata* (5070): WI Outagamie County: Appleton: MV trap, 3 September 2017.
 17. *Samea multiplicata* (5151): WI Outagamie County: Appleton: bait trail, 26 October 2017.
-



FIGURE 90: Southern Strays and Migrants (Pyralidae & Hesperidae).

1. *Glyphodes sibillalis* (5198): WI Outagamie County: Appleton: MV trap, 7 September 2016.

2. *Glyphodes sibillalis* (5198): WI Outagamie County: Appleton: MV trap, 7 September 2016.

3. *Terastia meticulosalis* (5239): WI Outagamie County: Appleton: MV trap, 12 July 2016.

4. *Diastictis argyralis* (5253): WI Outagamie County: Appleton: MV trap, 29 August 2017.

5. *Conchylodes ovulalis* (5292): WI Outagamie County: Appleton: MV trap, 8 July 2018.

*6. *Diacme elealis* (5142): WI Outagamie County: Appleton: MV trap, 31 October 2016.

*7. *Samea castellalis* (5150): WI Outagamie County: Appleton: MV trap, 31 October 2016.

8. *Carectocultus perstrialis* (5307): WI Door County: Sunset Drive near Baileys Harbor: boreal forest/wetlands, 18 August 2017.

Note: This locality is poorly studied for micros. This specimen might represent a disjunct population rather than a stray.

*9. *Hypsopygia nostralis* (5531): WI Outagamie County: Appleton: UV lights, 22 May 2023.

10. *Hylephila phyleus* (4013): WI Outagamie County: Prairie Hill Park: 30 September 2022.

11. *Hylephila phyleus* (4013): Same individual as number 10, underside.

12. *Hylephila phyleus* (4013): WI Outagamie County: Prairie Hill Park: 30 September 2022.

13. *Hylephila phyleus* (4013): Same individual as number 12, underside.

14. *Erynnis horatius* (3952): WI Outagamie County: Appleton: nectaring on *Solidago*, 9 September 2015.

15. *Erynnis horatius* (3952): Same individual as number 14, underside.

*=Added from recent field work or specimen backlog and not included in the text or tables.



FIGURE 91: Live Photos of Southern and Western Strays and Migrants (Noctuidae).

1. *Dargida procinctus* (10428): WI Outagamie County: Appleton: bait trail, 19 September 2018.
 2. *Renia discoloralis* (8381): WI Shawano County: Navarino Wildlife Area: bait trail, 2 August 2022.
 3. *Condica sutor* (9699): WI Outagamie County: Mosquito Hill: bait trail, 12 October 2021.
 4. *Autographa californica* (8914): WI Outagamie County: Fallen Timbers: landed on leaf during the day, 23 July 2020.
 5. *Spodoptera eridania* (9672): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 6. *Amyna stricta* (9070): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 7. *Melipotis perpendicularis* (8598): WI Outagamie County: Appleton: UV lights, 8 August 2019.
 8. *Melipotis jucunda* (8607): WI Shawano County: Navarino Wildlife Area: bait trail, 8 September 2022.
 9. *Ctenoplusia oxygramma* (8889): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 10. *Condica mobilis* (9693): WI Outagamie County: Appleton: bait trail, 27 September 2017.
 11. *Hypena minimalis* (8457): WI Shawano County: Navarino Wildlife Area: bait trail, 9 November 2022.
 12. *Anicla infecta* (10911): WI Outagamie County: Old Stone Bridge Trail: bait trail, 14 October 2020.
 13. TOP: *Spodoptera frugiperda* (9666); BOTTOM: *Spodoptera dolichos* (9671): WI Outagamie County: Appleton: bait trail, 16 October 2016.
 14. *Elaphria chalcedonia* (9679): WI Outagamie County: Appleton: bait trail, 16 October 2016.
 15. *Catocala piatrix* (8771): WI Outagamie County: Mosquito Hill: bait trail, 1 September 2022.
-



FIGURE 92: Live Photos of Southern and Western Strays and Migrants (Noctuidae & Geometridae).

1. *Pseudoplusia includens* (8890): WI Outagamie County: Fallen Timbers: bait trail, 19 September 2021.
 2. *Pseudoplusia includens* (8890): WI Outagamie County: Fallen Timbers: bait trail, 20 September 2022.
 3. *Dargida procinctus* (10428): WI Outagamie County: Old Stone Bridge Trail: bait trail, 7 October 2020.
 4. *Coryphista meadii* (7290): WI Outagamie County: Appleton: bait trail, 29 August 2021.
 5. *Pseudoplusia includens* (8890): WI Outagamie County: Mosquito Hill: prairie planting, nectaring on *Helianthus giganteus*, 16 September 2021.
 6. *Dargida procinctus* (10428): WI Outagamie County: Mosquito Hill: prairie planting, bait trail, 1 September 2022.
 7. *Sericaglaea signata* (9941): WI Shawano County: Navarino Wildlife Area: bait trail, 24 October 2022.
 8. *Agrotis subterranea* (10664): WI Outagamie County: Appleton: bait trail, 21 October 2017.
 9. *Pseudoplusia includens* (8890): WI Outagamie County: Fallen Timbers: bait trail, 10 October 2021.
 10. *Autographa californica* (8914): WI Shawano County: Navarino Wildlife Area: bait trail, 9 November 2022.
 11. *Mocis latipes* (8743): WI Outagamie County: Fallen Timbers: bait trail, 9 October 2021.
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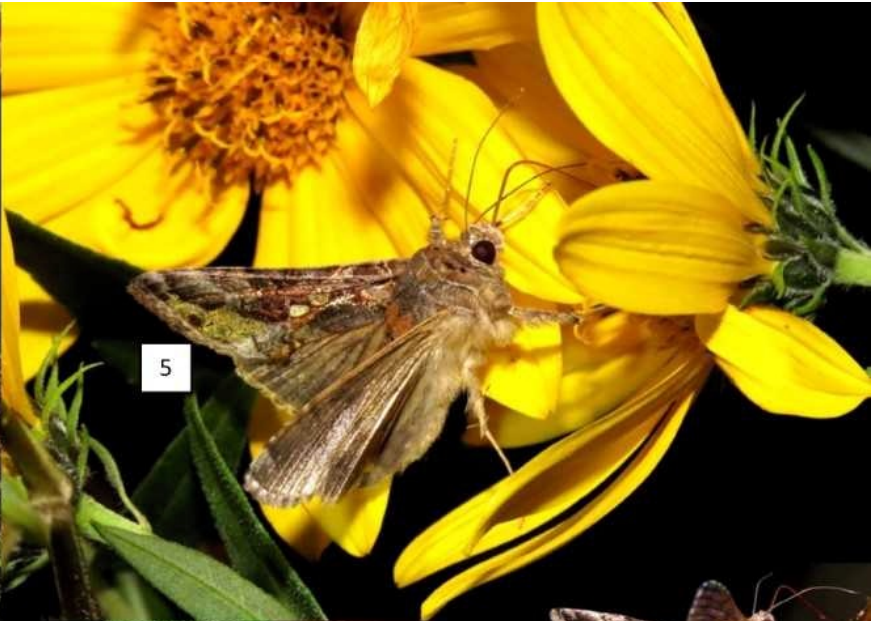


FIGURE 93: Live Photos of Southern Strays and Migrants (Pyrilidae).

1. *Ategumia ebulealis* (5158): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 2. *Diaphania hyalinata* (5204): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 3. *Herpetogramma phaeopteralis* (5274): WI Outagamie County: Appleton: bait trail, 19 October 2016.
 4. *Dicymolomia julianalis* (4889): WI Outagamie County: North Bluemound Drive Power Line Cut: nectarig on *Solidago*, 30 August 2021.
 5. *Udea rubigalis* (5079): WI Outagamie County: Appleton: bait trail, 18 October 2016.
 6. *Pyrausta onythesalis* (5042): WI Outagamie County: Appleton: UV lights, 1 August 2017.
 7. *Patania silicanis* (5243): WI Outagamie County: Mosquito Hill: bait trail, 12 October 2021.
 8. *Herpetogramma bipunctalis* (5272): WI Outagamie County: North Bluemound Drive Power Line Cut: nectarig on *Helianthus giganteus*, 23 September 2020.
 9. *Hymenia perspectalis* (5169): WI Outagamie County: Mosquito Hill: nectaring on Pale Indian Plantain, 13 October 2021, 11:47AM.
 10. *Lineodes integra* (5107): WI Outagamie County: Appleton: bait trail, 17 October 2016.
 11. *Pyrausta inveterascalis* (5036): WI Outagamie County: Appleton: UV lights, 8 July 2017.
 12. *Spoladea recurvalis* (5170): WI Outagamie County: Appleton: bait trail, 15 October 2016.
 13. *Pilocrocis ramentalis* (5281): WI Outagamie County: Appleton: bait trail, 27 September 2017.
 14. *Patania silicanis* (5243): WI Outagamie County: Fallen Timbers: bait trail, 10 October 2021.
 15. *Herpetogramma bipunctalis* (5272): WI Outagamie County: Appleton: landed on Magnolia leaf, 17 October 2016.
-

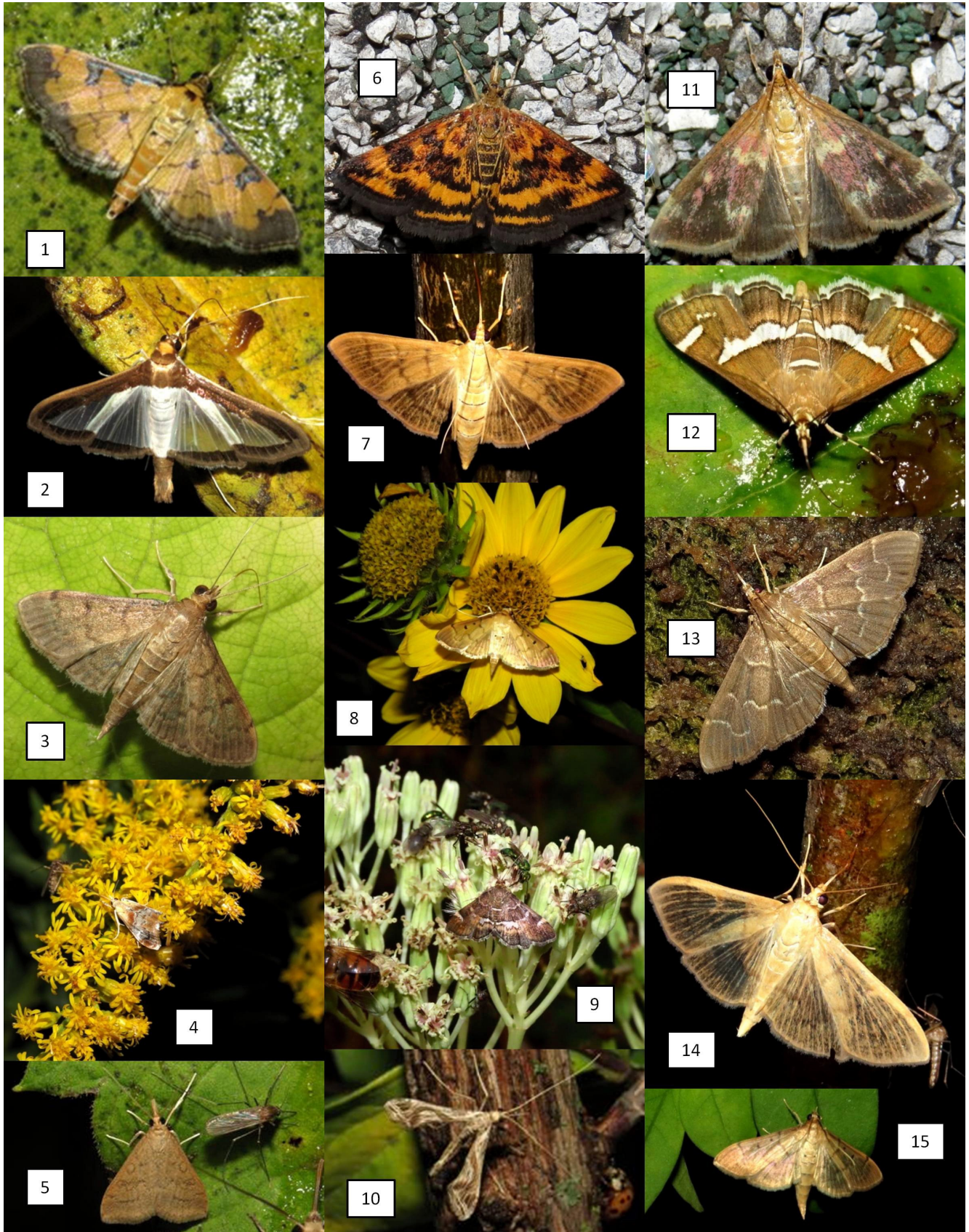


FIGURE 94: Northern Strays.

1. *Speranza brunneata* (6286): WI Outagamie County: Appleton: UV lights, 18 June 2017.
2. *Hyles gallii* (7893): WI Outagamie County: Appleton: UV lights, 14 July 2022.
3. *Sunira* species: WI Outagamie County: Appleton: UV lights, 20 September 2017.
Note: I think this is *Sunira verberata* (9960), but unfortunately I did not recognize the significance of this individual until later, and I did not collect a voucher specimen to confirm the identification.
4. *Syngrapha rectangula* (8942): WI Outagamie County: Appleton: MV trap, 26 June 2020.
5. *Syngrapha octoscripta* (8926): WI Outagamie County: Appleton: UV trap, 27 July 1996.
- *6. *Syngrapha abstrusa* (8940): WI Outagamie County: Appleton: UV light, 21 June 1995;
Dissection Number: HLK/PLS/1998:4.
- *7. *Syngrapha epigaea* (8927): WI Outagamie County: Appleton: lighted sheet, 26 August 1993.
- *8. *Autographa ampla* (8923): WI Outagamie County: Appleton: 1981.
9. *Catocala antinympha* (8775): WI Outagamie County: Appleton: bait trail, 15 July 2018.
10. *Catocala antinympha* (8775): WI Outagamie County: Appleton: bait trap, 25 July 2017.
11. *Catocala sordida* (8846): WI Outagamie County: Appleton: bait trail, 15 August 2019.
12. *Manulea bicolor* (8043): WI Brown County: Village of Howard: 15 August 1991.

*This record was inadvertently omitted from the tables and text.



FIGURE 95: Palearctic Colonizations (microlepidoptera).

1. *Stigmella multispicata* (86.1) [NEPTICULIDAE]: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 31 May 2023.
 2. *Etainia sericopeza* (38) [NEPTICULIDAE]: IL Dupage County: Wheaton: suburban yard, 14 August 2022.
 3. *Acleris comariana* (3507) [TORTRICIDAE]: WI Outagamie County: Appleton: UV lights, 17 September 2022.
 4. *Duponchelia fovealis* (5156.5) [PYRALIDAE]: WI Outagamie County: Appleton: bait trail, 10 July 2018.
 5. *Depressaria depressana* (924.1) [DEPRESSARIDAE]: WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/field/prairie planting, MV trap 1, 17 September 2018.
 6. *Sitochroa palealis* (4986.1) [PYRALIDAE]: WI Outagamie County: Appleton: MV trap, 12 July 2017.
 7. *Promalactis suzukiella* (1047.1) [OECOPHORIDAE]: WI Outagamie County: Appleton: UV trap, 2 October 2021.
 8. *Depressaria depressana* (924.1) [DEPRESSARIDAE]: WI Outagamie County: Fallen Timbers: hydric hardwood forest, UV trap 3, 17 September 2018.
 9. *Anania hortulata* (4952) [PYRALIDAE]: WI Outagamie County: Appleton: MV trap, 18 June 2019.
 10. *Anania hortulata* (4952) [PYRALIDAE]: WI Outagamie County: Fallen Timbers: white cedar swamp, MV trap, 8 June 2021.
 11. *Agonopterix alstroemeriana* (874.1) [DEPRESSARIDAE]: WI Outagamie County: Appleton: MV trap, 2 May 2018.
 12. *Paracorsia repandalis* (4992.5) [PYRALIDAE]: WI Outagamie County: Appleton: UV lights, 30 August 2021.
 - *13. *Paracorsia repandalis* (4992.5) [PYRALIDAE]: WI Outagamie County: Appleton: MV trap, 27 August 2020. *=Specimen identified recently; not included in the text or tables.
 14. *Hedya salicella* (2864.1) [TORTRICIDAE]: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, UV sheet 10, 5 July 2022.
 15. *Epinotia nanana* (3338) [TORTRICIDAE]: WI Outagamie County: Appleton: MV trap, 2 June 2017.
 16. *Acentria ephemerella* (5299) [PYRALIDAE]: WI Outagamie County: Appleton: MV trap, 8 July 2017.
-

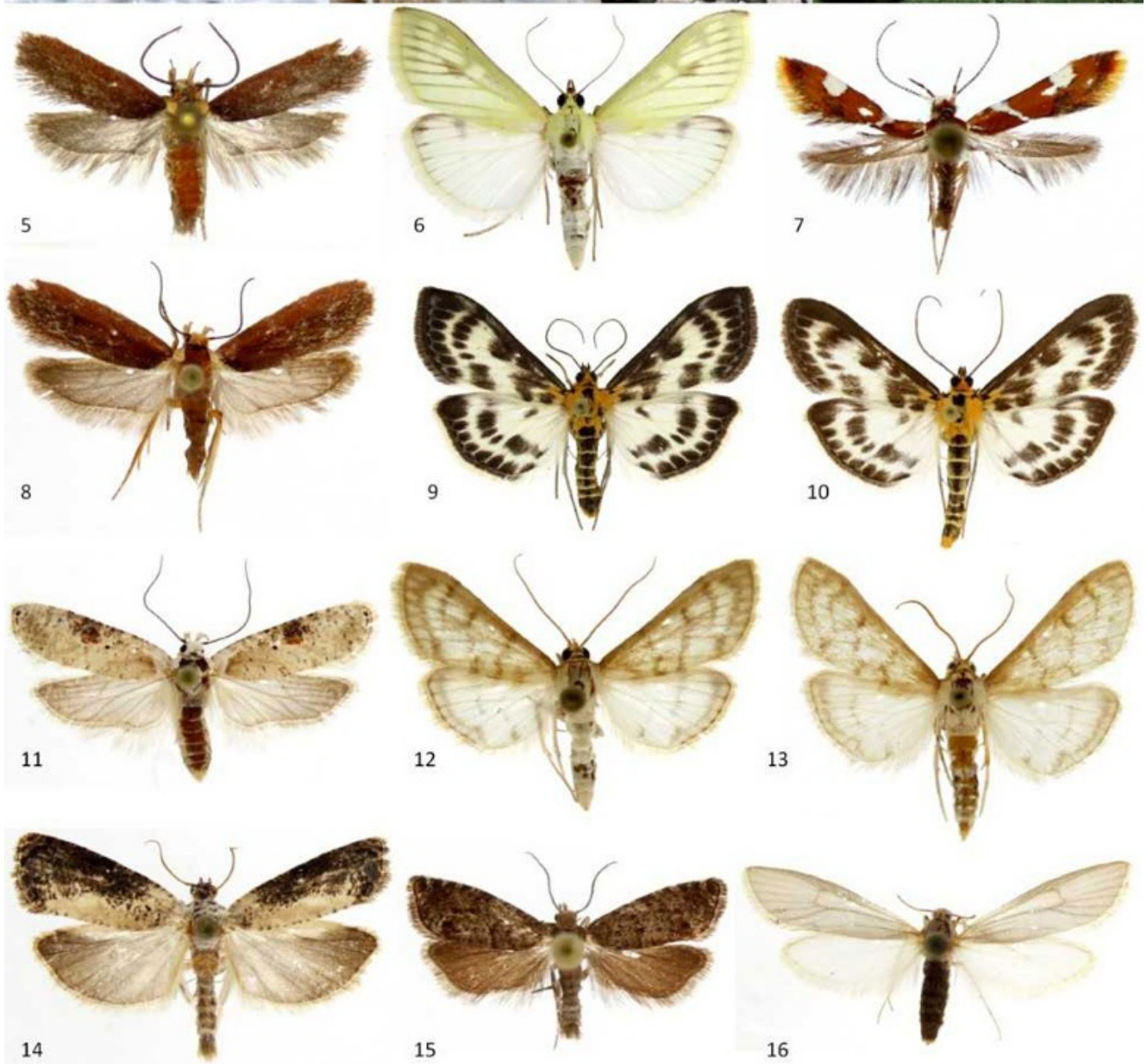


FIGURE 96: Palearctic Colonizations (Macrolepidoptera).

1. *Pasiphila rectangula* (7625) [GEOMETRIDAE]: WI Outagamie County: Appleton: MV trap, 7 June 2017.
 2. *Pasiphila rectangula* (7625) [GEOMETRIDAE]: WI Outagamie County: Appleton: MV trap, 7 June 2017.
 3. *Idaea dimidiata* (7126) [GEOMETRIDAE]: WI Outagamie County: Appleton: 9 July 2022.
 4. *Idaea dimidiata* (7126) [GEOMETRIDAE]: WI Outagamie County: Appleton: MV trap, 7 July 2019.
 5. *Pasiphila rectangula* (7625) [GEOMETRIDAE]: WI Outagamie County: Appleton: UV lights, 19 June 2017.
 6. *Pasiphila rectangula* (7625) [GEOMETRIDAE]: WI Outagamie County: Appleton: UV lights, 28 June 2017.
 7. *Lymantria dispar* (Gypsy Moth) (8318) ♂ [NOCTUIDAE]: WI Shawano County: Navarino Wildlife Area: UV trap 18, 2 August 2022.
 8. *Lymantria dispar* (Gypsy Moth) (8318) ♀ [NOCTUIDAE]: WI Outagamie County: Mosquito Hill: hill top, on oak tree trunk, with egg mass. 25 July 2020.
 9. *Lymantria dispar* (Gypsy Moth) (8318) Larva [NOCTUIDAE]: WI Outagamie County: Mosquito Hill: hill top, on oak tree trunk, 11 July 2020.
 10. *Lymantria dispar* (Gypsy Moth) (8318) ♂ [NOCTUIDAE]: WI Outagamie County: Mosquito Hill: lighted shed, 24 July 2020.
 11. *Hyles euphorbiae* (7892) [SPHINGIDAE]: WI Outagamie County: Appleton: MV trap, 8 June 2017.
 12. *Caradrina clavipalpis* (9660.1): IL DuPage County: Wheaton, UV light, 21 September 2023.
NOTE: I am not yet aware of any WI records, but expect there will be soon.
 13. *Calophasia lunula* (10177) [NOCTUIDAE]: WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 27 May 2020.
 14. *Calophasia lunula* (10177) [NOCTUIDAE]: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 28 August 2022.
 15. *Calophasia lunula* (10177) [NOCTUIDAE]: WI Outagamie County: Mosquito Hill: south side of hill/upland prairie planting, UV trap 6, 22 May 2021.
-

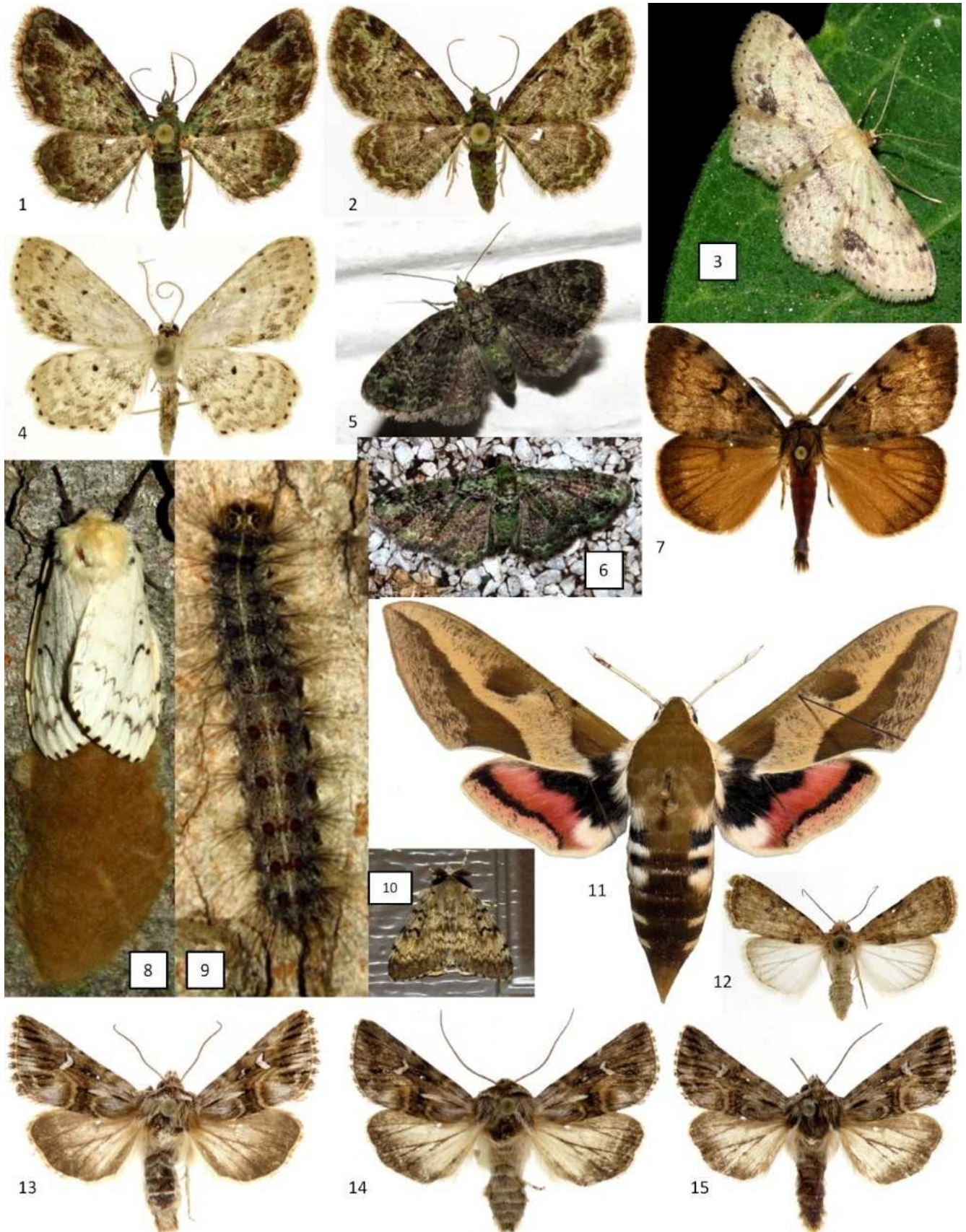


FIGURE 97: Palearctic Colonizations (Noctuidae).

1. *Apamea unanimitis* (9362.2): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 26 May 2020.
 2. *Apamea unanimitis* (9362.2): WI Outagamie County: Appleton: MV trap, 24 May 2020.
 3. *Apamea unanimitis* (9362.2): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 26 May 2020.
 4. *Apamea ophiogramma* (9362.1): WI Outagamie County: Appleton: MV trap, 3 July 2017.
 5. *Apamea ophiogramma* (9362.1): WI Outagamie County: Appleton: bait trail, 13 July 2018.
 6. *Apamea ophiogramma* (9362.1): WI Outagamie County: Appleton: MV trap, 7 July 2020.
 7. *Apamea ophiogramma* (9362.1): WI Outagamie County: Appleton: bait trail, 13 July 2018.
 8. *Hydraecia micacea* (9514): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 1 August 2019.
 9. *Rhizedra lutosa* (9447.2): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 26 September 2020.
 10. *Rhizedra lutosa* (9447.2): WI Outagamie County: Appleton: MV trap, 5 October 2016.
 11. *Rhizedra lutosa* (9447.2): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 25 September 2022.
 12. *Rhizedra lutosa* (9447.2): *Rhizedra lutosa* (9447.2): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 6 October 2020.
 13. *Noctua pronuba* (11012.1): WI Outagamie County: Appleton: UV lights, 13 August 2016.
 14. *Noctua pronuba* (11012.1): WI Outagamie County: Appleton: MV trap, 13 August 2016.
 15. *Noctua pronuba* (11012.1): WI Outagamie County: Appleton: bait trap, 31 July 2016.
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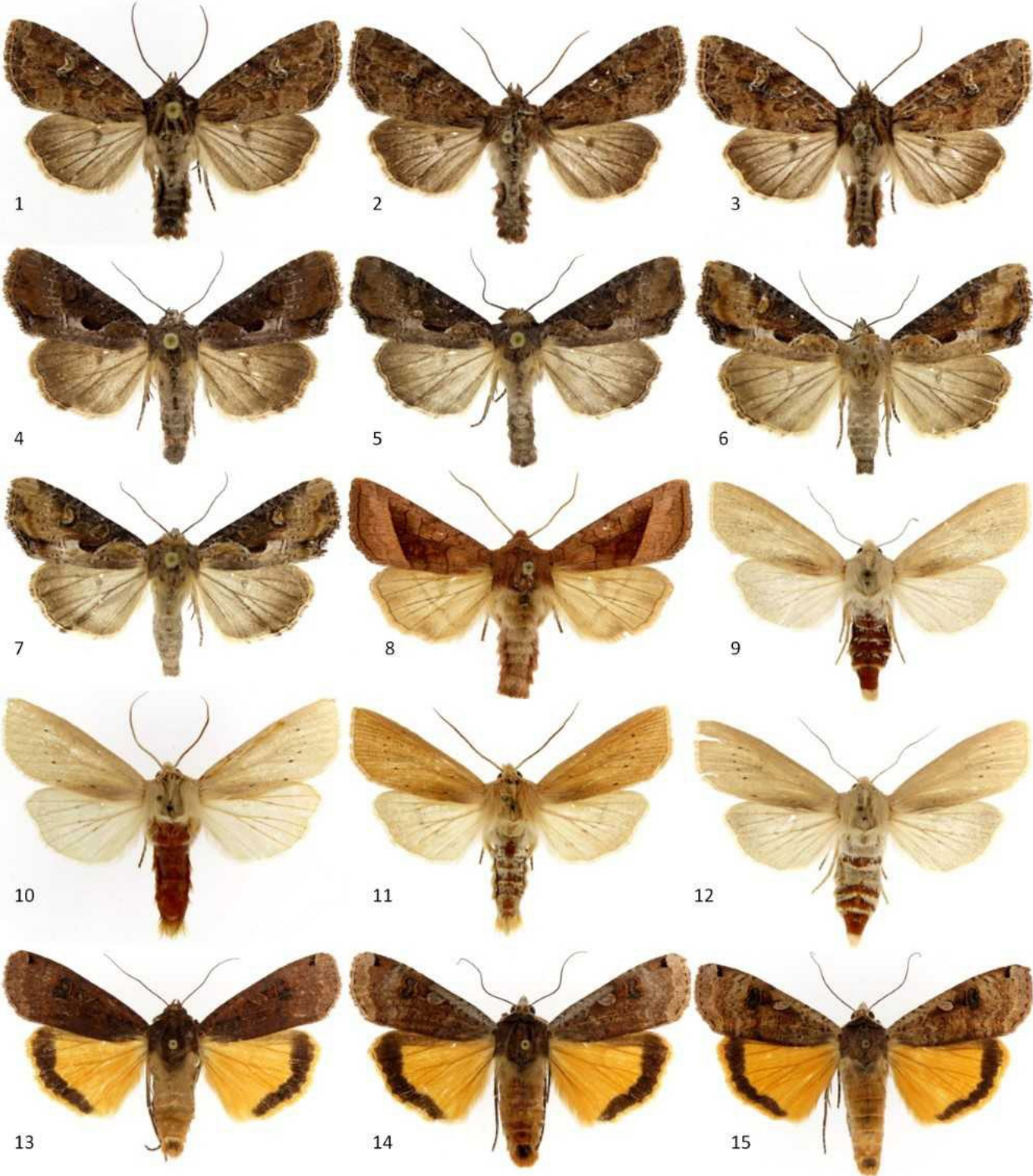


FIGURE 98: Recent Colonizations by Southern Species Expanding their Ranges North (Live Photos).

1. *Catocala nebulosa* (8796): WI Outagamie County: Mosquito Hill: bait trail on hillside, 24 July 2020.
 2. *Catocala insolabilis* (8791): WI Outagamie County: Mosquito Hill: bait trail on hillside, 24 July 2020.
 3. *Catocala residua* (8785): WI Outagamie County: Mosquito Hill: bait trail on hillside, 2 September 2020.
 4. *Catocala connubialis* (8877): WI Outagamie County: Mosquito Hill: bait trail on hillside, 25 July 2020.
 5. *Dardiga rubripennis* (10434): WI Outagamie County: Mosquito Hill: prairie planting, 25 July 2020.
 6. *Lithophane franclemonti* (9887.1): WI Outagamie County: Mosquito Hill: bait trail on hillside, 5 October 2020.
 7. *Epiglaea decliva* (9946): WI Outagamie County: Old Stone Bridge Trail: bait trail, 14 October 2020.
-

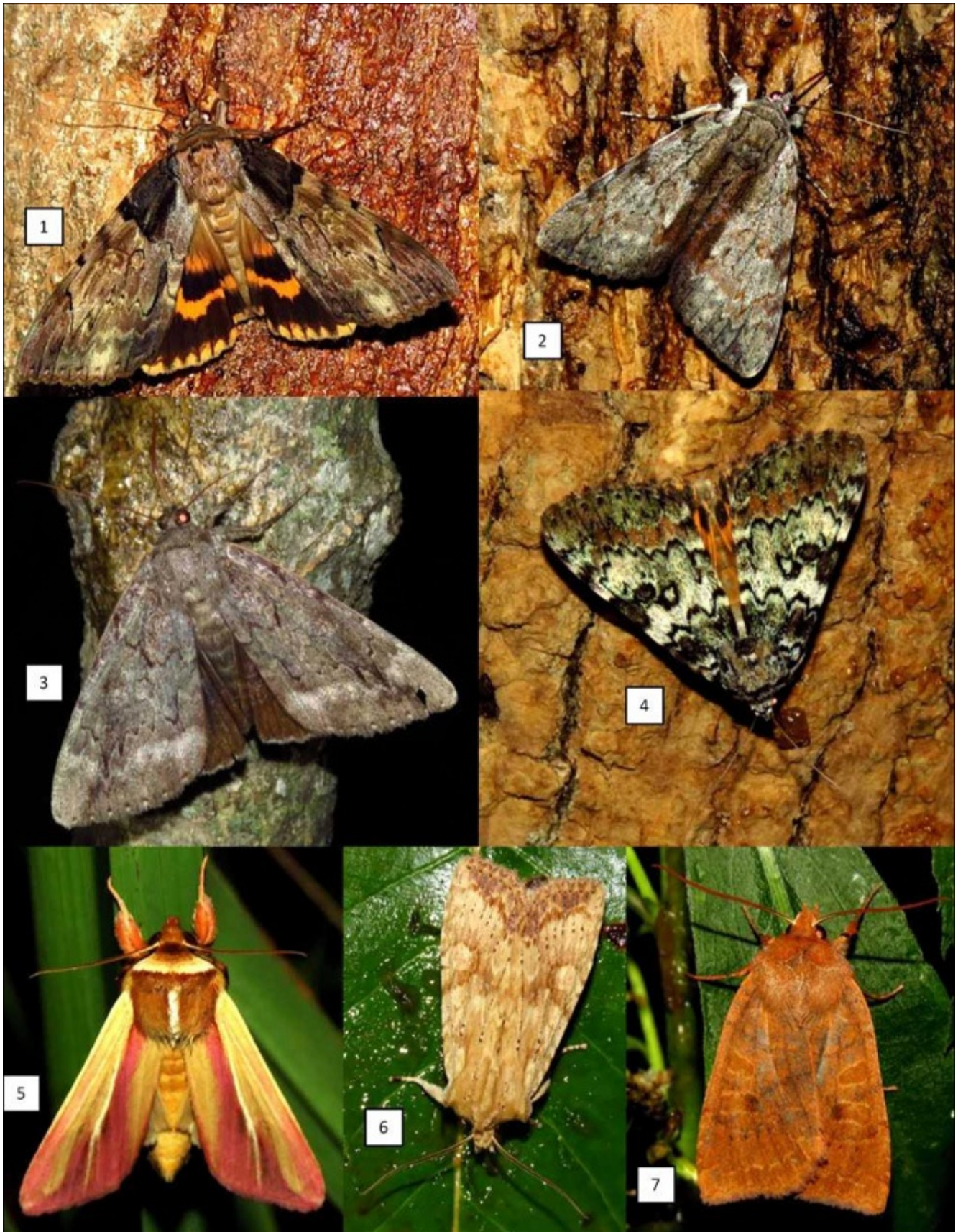


FIGURE 99: Newly Recorded Species for Outagamie County and Adjacent Areas (Geometridae).

1. *Alsophila pometaria* (6258): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest, 4 November 2020.
 2. *Alsophila pometaria* (6258): WI Outagamie County: Appleton: UV lights, 1 November 2020.
 3. *Speranza brunneata* (6286): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap, 22 June 2022. See also Figure 94(1).
 4. *Isturgia dislocaria* (6419): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine-hardwood forest, UV trap 11, 29 May 2022.
 5. *Isturgia dislocaria* (6419): WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 3 June 2020.
 6. *Isturgia dislocaria* (6419): WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 21 May 2020.
 7. *Macaria transitaria* (6335): WI Outagamie County: Appleton: MV trap, 20 August 2019.
 8. *Macaria transitaria* (6335): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
 9. *Cingilia catenaria* (6898): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/field with prairie planting, MV trap 1, 17 September 2018.
 10. *Cabera quadrifasciaria* (6680): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, UV trap 6, 3 June 2020.
 11. *Cabera quadrifasciaria* (6680): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, UV trap 6, 3 June 2020.
 12. *Hethemia pistaciaria* (7084): WI Outagamie County: Appleton: MV trap, 5 June 2020.
 13. *Orthonama evansi* (7415): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 23 June 2023.
 14. *Orthonama evansi* (7415): WI Winnebago County: Wiouwash Trail just south of Outagamie County border, sedge meadow/shrubby wetland, UV trap, 2 August 2021.
 15. *Orthonama evansi* (7415): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 23 June 2023.
-



FIGURE 100: Newly Recorded Species for Outagamie County and Adjacent Areas (Geometridae, Limacodidae, & Rhopalocera).

1. *Speranza abruptata* (6294) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
 2. *Speranza abruptata* (6294) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
 3. *Speranza abruptata* (6294) ♀: WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 23 June 2023.
 4. *Speranza abruptata* (6294) ♀: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 10 July 2022.
 5. *Eufidonia discospilata* (6639): WI Shawano County: Navarino Wildlife Area: open bog with tamarack, birch, abundant leatherleaf and cotton grass, diurnal, 27 May 2022.
 6. *Metarranthis amyrisaria* (6824): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 31 May 2023.
 7. *Selenia alciphearia* (6817): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 26 July 2023.
 8. *Selenia alciphearia* (6817): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 26 July 2023.
 9. *Selenia alciphearia* (6817): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 2 August 2022.
 10. *Selenia kentaria* (6818): WI Shawano County: Navarino Wildlife Area: mesic oak-pine-hardwood forest, UV trap 9, 14 May 2022.
 11. *Mesothea incertata* (7085): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 10, 29 May 2022.
 12. *Hesperia leonardus* (4023): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, nectaring on *Liatris*, 8 September 2022.
 13. *Packardia elegans* (4661): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 22 June 2022.
 14. *Packardia elegans* (4661): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 22 June 2022.
 15. *Euphydryas phaeton* (4516): WI Shawano County: Navarino Wildlife Area: sedge meadow along east side of Pike's Peak Flowage, 9 July 2023.
-



FIGURE 101: Newly Recorded Species for Outagamie County and Adjacent Areas (Geometridae, Epiplemlidae, Thyatiridae, & Lycaenidae).

1. *Eupithecia mutata* (7575): WI Outagamie County: Appleton: MV trap, 21 June 2020.
 2. *Eupithecia mutata* (7575): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
 3. *Eupithecia assimolata* (7528): WI Shawano County: Navarino Wildlife Area: mesic hardwood/pine/hemlock forest, UV trap 12, 29 May 2022.
 4. *Eupithecia cimicifugata* (7524): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland, netted flying at night, 3 June 2020.
 5. *Eupithecia cimicifugata* (7524): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland, netted flying at night, 3 June 2020.
 6. *Acasis viridata* (7635): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 2 May 2020.
 7. *Callizia amorata* (7650): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine-hardwood forest, UV trap 16, 22 June 2022.
 8. *Callizia amorata* (7650): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine-hardwood forest, UV trap 16, 22 June 2022.
 9. *Stamnodes gibbicostata* (7333): WI Outagamie County: Fox River Walk: mesic hardwood forest along Fox River, UV trap, 11 September 2021.
 10. *Euthyatira pudens* (6240): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 2 May 2020.
 11. *Euthyatira pudens* (6240): WI Shawano County: Navarino Wildlife Area: mesic oak-pine-hardwood forest, UV trap 9, 15 May 2022.
 12. *Euthyatira pudens* (6240): WI Outagamie County: Old Stone Bridge Trail: bait trail, 30 April 2020.
 13. *Euthyatira pudens* (6240): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, bait trail, 1 May 2020.
 14. *Euthyatira pudens* (6240): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 13 April 2023.
 15. *Euthyatira pudens* (6240): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 18, 1 May 2021.
 16. *Xanthorhoe species 1* (7390.1): WI Outagamie County: sedge meadow north of Allcan Road, UV trap, 10 July 2020.
 17. *Callophrys augustinus* (4322): WI Shawano Co: Navarino Wildlife Area: intermediate succession scrubby oak-pine woodland with barrens openings on north side of bog, 21 May 2023.
 18. *Callophrys augustinus* (4322): Same individual as Number 16 (underside).
 19. *Eupithecia assimolata* (7528): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, UV trap 18, 27 July 2021.
-



FIGURE 102: Newly Recorded Species for Outagamie County (Saturniidae).

1. *Anisota senatoria* (7719) ♀: WI Outagamie County: Mosquito Hill: on lighted shed, 10 July 2020.
2. *Anisota senatoria* (7719) ♀: WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, UV trap 6, 1 July 2020.
3. *Anisota senatoria* (7719) ♀: WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, MV trap 6, 5 July 2022.
4. *Anisota senatoria* (7719) ♀: WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, MV trap 6, 5 July 2022.
5. *Anisota senatoria* (7719) ♀: WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, MV trap 6, 5 July 2022.
6. *Anisota senatoria* (7719) ♂: Same individual in Number 10.
7. *Anisota senatoria* (7719) late instar larva: WI Outagamie County: Mosquito Hill: hilltop, feeding on black oak leaf, 3 September 2020.
8. *Anisota senatoria* (7719) egg mass: WI Outagamie County: Mosquito Hill: prairie planting, on bur oak leaf, 26 July 2022.
9. *Anisota senatoria* (7719) first instar larvae: WI Outagamie County: Mosquito Hill: prairie planting, on bur oak leaf, 26 July 2022.
10. *Anisota senatoria* (7719) mating pair; top: ♀; bottom: ♂: WI Outagamie County: Mosquito Hill: on building under light, 18 July 2023.

The following phenotypes have been attributed to *Anisota virginiensis*. However, I think it is possible that these might actually be variants of *Anisota senatoria*, and that *Anisota virginiensis* might not really occur in Wisconsin.

11. *Anisota virginiensis?* (7723) ♀: WI Outagamie County: Mosquito Hill: prairie planting between hill and floodplain, MV sheet 23, 22 July 2022.
 12. *Anisota virginiensis?* (7723) ♀: WI Outagamie County: Mosquito Hill: prairie planting between hill and floodplain, MV sheet 23, 22 July 2022.
 13. *Anisota virginiensis?* (7723) ♂: WI Outagamie County: Mosquito Hill: hill top oak opening in mesic hardwood forest, 5 July 2022.
-

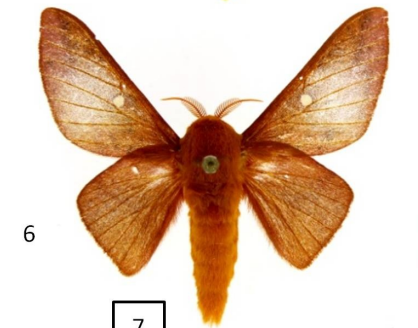


FIGURE 103: Newly Recorded Species for Outagamie County and Adjacent Areas (Mimallonidae, Notodontidae, & Noctuidae: Lymantriinae & Arctiinae).

1. *Cicinnus melsheimeri* (7662): WI Shawano County: Navarino Wildlife Area: oak-pine upland clearing near hardwood forest/wetlands, UV sheet 17, 22 June 2022.
 2. *Heterocampa pulverea* (7990.1): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 10 July 2022.
 3. *Heterocampa pulverea* (7990.1): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 June 2023.
 4. *Schizura concinna* complex phenotype 2 (8010): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 5 August 2022.
 5. *Schizura concinna* complex phenotype 2 (8010): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, UV trap 10, 26 July 2023.
 6. *Schizura concinna* complex phenotype 2 (8010): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 7. *Notodonta scitipennis* (7926): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 18, 8 June 2021.
 8. *Notodonta scitipennis* (7926): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 9. *Notodonta scitipennis* (7926): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 18, 8 June 2021.
 10. *Notodonta scitipennis* (7926): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 11. *Notodonta scitipennis* (7926): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 31 May 2023.
 12. *Notodonta scitipennis* (7926): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 18, 8 June 2021.
 13. *Phragmatobia assimilans* (8158): WI Shawano Co: Navarino Wildlife Area: oak-pine-hardwood forest/shrubby area, MV trap 5, 15 May 2022.
 14. *Dasychira pinicola* (8305): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 28 August 2022.
 15. *Dasychira basiflava* or species near (8296): WI Shawano County: Navarino Wildlife Area: high sedge meadow/hardwood swamp, UV trap 20, 5 August 2022.
-



FIGURE 104: Newly Recorded Species and/or Recent Colonizations for Outagamie County and Adjacent Areas, and Southern Species of Uncertain Status Recorded from Southern Wisconsin (Noctuidae: Arctiinae).

1. *Virbia opella* (8118): WI Outagamie County: Appleton: MV trap, 15 July 2017.
 2. *Virbia opella* (8118): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine-hardwood forest, UV trap 16, 22 June 2022.
 3. *Virbia opella* (8118): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 23 June 2023.
 4. *Crambidia casta complex* (8051): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens with abundant lichens on the ground, MV trap, 5 August 2022.
 5. *Virbia nigricans* (8119): WI Outagamie County: Mosquito Hill: upland prairie planting/ mesic hardwood forest edge, MV trap 6, 3 July 2021.
 6. *Virbia immaculata* (8124): WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 24 August 2021.
 7. *Apantesis phalerata* (8169): WI Outagamie County: Mosquito Hill: wet-mesic prairie planting/floodplain forest edge, UV trap 20, 23 August 2022.
 8. *Apantesis phalerata* (8169): WI Outagamie County: North Bluemound Drive Power Line Cut: field/prairie planting, UV trap, 27 May 2020.
 9. *Apantesis phalerata* (8169): WI Outagamie County: Appleton: MV trap, 4 August 2018.
 10. *Apantesis phalerata* (8169): WI Outagamie County: Fox Cities Paper Trail by Fox Valley Technical College: field with prairie planting, UV trap, 21 August 2022.
 11. *Apantesis phalerata* (8169): WI Outagamie County: Mosquito Hill: wet-mesic prairie planting/floodplain forest edge, UV trap 20, 23 August 2022.
 12. *Apantesis vittata* (8170): WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 18 August 2021.
 13. *Grammia oithona* (8195): WI Outagamie County: Mosquito Hill: upland prairie planting/ mesic hardwood forest edge, UV trap 6, 4 June 2021.
- The following species is not newly recorded but is shown for comparison; it was regularly recorded in the 1990s as well as during recent surveys.**
14. *Apantesis nais* (8171): WI Outagamie County: Mosquito Hill: hill top, mesic hardwood forest/grassland, UV trap 4, 17 May 2021.
 15. *Apantesis nais* (8171): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 31 May 2023.
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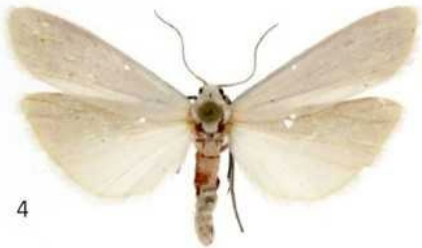


FIGURE 105: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae).

1. *Grammia margo* (8172.1) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 10, 29 May 2022.
 2. *Grammia margo* (8172.1) ♀: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 May 2023.
 3. *Grammia margo* (8172.1) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 May 2023.
 4. *Cycnia collaris* (8229): WI Outagamie County: Mosquito Hill: upland prairie planting/ mesic hardwood forest edge, UV trap 6, 24 July 2020.
 5. *Cycnia collaris* (8229): WI Outagamie County: Mosquito Hill: prairie planting between hill and floodplain, MV sheet 23, 22 July 2022.
 6. *Cycnia collaris* (8229): WI Outagamie County: Mosquito Hill: upland prairie planting/ mesic hardwood forest edge, UV trap 6, 24 July 2020.
 7. *Plusiodonta compressipalpis* (8534): WI Outagamie County: Mosquito Hill: mesic hardwood forest on hill, bait trail, 18 July 2021.
 8. *Plusiodonta compressipalpis* (8534): WI Outagamie County: Mosquito Hill: mesic hardwood forest on hill, bait trail, 2 September 2020.
 9. *Epantheria scribbonia* (8146): WI Shawano County: Navarino Wildlife Area: oak-pine upland clearing near hardwood forest/wetlands, UV sheet 17, 22 June 2022.
 10. *Zale aeruginosa* species 1 (8694): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest, bait trail, 20 May 2022.
 11. *Catocala connubialis* (8877): WI Outagamie County: Mosquito Hill: bait trail on hilltop, 24 July 2020.
 12. *Lophocampa maculata* (8214): WI Shawano County: Navarino Wildlife Area: netted in oak-pine uplands near sedge meadow with bog elements, 23 June 2022.
 13. *Catocala amestris* (8844): WI Outagamie County: Appleton: bait trap, 19 July 2019.
 14. *Catocala amestris* (8844): WI Outagamie County: Appleton: bait trap, 19 July 2019.
 15. *Catocala amestris* (8844): WI Outagamie County: Appleton: bait trap, 10 July 2018.
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FIGURE 106: *Catocala* species (Noctuidae), Including Newly Recorded Species and Recent Colonizations for Outagamie County.

1. *Catocala umbrosa* (8801.1): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 5 August 2022.

2. *Catocala umbrosa* (8801.1): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 2 August 2022.

3. *Catocala umbrosa* (8801.1): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, bait trail, 24 July 2020.

Note: *Catocala ilia* was common and widespread in Outagamie County with both recent and historical surveys. It is shown for comparison with *Catocala umbrosa*.

4. *Catocala ilia* (8801): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 10 July 2020.

5. *Catocala ilia* (8801): WI Outagamie County: Appleton: bait trail, 10 July 2018.

6. *Catocala ilia* (8801): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 10 July 2020.

7. *Catocala residua* (8785): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 24 July 2020.

8. *Catocala residua* (8785): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 24 July 2020.

9. *Catocala palaeogama* (8795) form "**phalanga**": WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 24 July 2020.

Note: This species was regularly recorded at Mosquito Hill with both recent and historical surveys, but this is the only record of this form for Outagamie County to date.

10. *Catocala insolabilis* (8791): WI Outagamie County: Appleton: bait trail, 21 July 2022.

11. *Catocala insolabilis* (8791): WI Outagamie County: Appleton: bait trail, 21 July 2020.

12. *Catocala insolabilis* (8791): WI Outagamie County: Appleton: bait trail, 21 July 2020.

13. *Catocala insolabilis* (8791): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 24 July 2020.

14. *Catocala insolabilis* (8791): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, 24 July 2020.

15. *Catocala insolabilis* (8791): WI Outagamie County: Appleton: nectaring on Common Milkweed, 27 July 2020.



FIGURE 107: *Catocala nebulosa*, a Recent Colonization Now Found Regularly at Three Sites in Outagamie County (Noctuidae: Erebinae).

1. *Catocala nebulosa* (8796): WI Outagamie County: Appleton: bait trail, 19 August 2019.
2. *Catocala nebulosa* (8796): WI Outagamie County: Appleton: bait trail, 9 August 2019.
3. *Catocala nebulosa* (8796): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, bait trail, 24 July 2020.
4. *Catocala nebulosa* (8796): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, bait trail, 24 July 2020.
5. *Catocala nebulosa* (8796): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, bait trail, 24 July 2020.
6. *Catocala nebulosa* (8796): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest, bait trail, 25 July 2020.
7. *Catocala nebulosa* (8796): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 31 July 2020.
8. *Catocala nebulosa* (8796): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 31 July 2020.
9. *Catocala nebulosa* (8796): WI Outagamie County: Fallen Timbers: hydric hardwood forest, on forest floor, 31 July 2020.

Note: All these specimens were photographed with a flash except for Number 6.



FIGURE 108: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae).

1. *Nycteola cinereana* (8977): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, UV Trap 18, 16 July 2020.
2. *Nycteola cinereana* (8977): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, bait trail, 8 November 2020.
3. *Nycteola cinereana* (8977): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
4. *Psychomorpha epimenis* (9309): WI Shawano County: Navarino Wildlife Area: raised grassy trail through sedge meadow and cattail marsh, diurnal, netted in flight, 23 May 2022.
5. *Psychomorpha epimenis* (9309): WI Outagamie County: Fallen Timbers: hydric hardwood forest, diurnal, flying around mud puddle, 15 May 2020.
6. *Nycteola* species: WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest, bait trail, 9 November 2020.
7. *Heliothis ascecius* (11072): WI Outagamie County: Mosquito Hill: prairie planting between hill and floodplain, MV sheet 23, 22 July 2022.
8. *Psaphida grandis* (10013): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland/shrubby areas, MV trap 13, 22 March 2021.
9. *Psaphida grandis* (10013): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland/shrubby areas, MV trap 13, 22 March 2021.
10. *Acronicta afflicta* (9254): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 10, 29 May 2022.
11. *Acronicta afflicta* (9254): WI Outagamie County: Appleton: MV trap, 17 August 2018.
12. *Acronicta afflicta* (9254): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland by sandstone cliffs, MV trap 4, 1 July 2020.
13. *Acronicta betulae* (9208): WI Outagamie County: Appleton: MV trap, 4 June 2020.
- *14. *Acronicta hamamelis* (9248): WI Shawano County: Navarino Wildlife Area: oak-pine forest edge/sedge meadow with bog elements, UV trap 18, 23 June 2023.
15. *Acronicta tritona* (9211): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 5 August 2022.

*=This record was added from recent field work and is not included in the species account.



FIGURE 109: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae: Psaphidinae).

1. *Feralia comstocki* (10008): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 17, 1 May 2020.
 2. *Feralia comstocki* (10008): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 11 May 2023.
 3. *Feralia comstocki* (10008): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 11 May 2023.
 4. *Feralia comstocki* (10008): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland by sandstone cliffs, MV trap 4, 22 May 2020.
 5. *Feralia major* (10007): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland/shrubby areas, MV trap 13, 4 April 2021.
 6. *Feralia major* (10007): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland/shrubby areas, MV trap 13, 4 April 2021.
 7. *Feralia major* (10007): WI Outagamie County: Fallen Timbers: hydric hardwood forest, MV trap 13, 8 April 2020.
 8. *Feralia major* (10007): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, UV trap 7, 23 April 2022.
 9. *Feralia major* (10007): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 10, 11 April 2023.
 10. *Feralia jocosa* (10005): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 18, 14 April 2023.
 11. *Feralia jocosa* (10005): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 13 April 2023.
 12. *Feralia jocosa* (10005): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 13 April 2023.
 13. *Feralia jocosa* (10005): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 13 April 2023.
 14. *Feralia jocosa* (10005): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 13 April 2023.
 15. *Feralia jocosa* (10005): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 13 April 2023.
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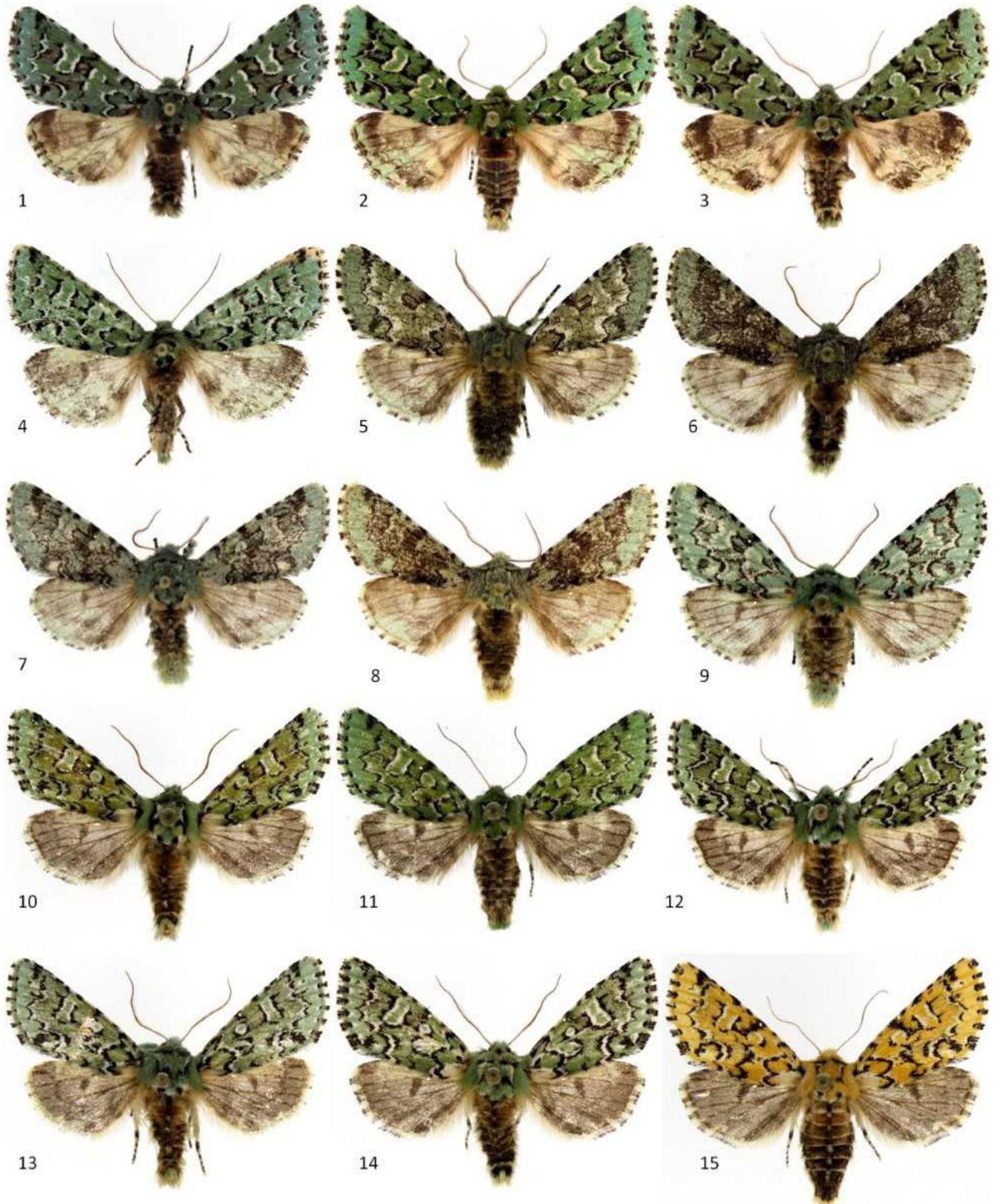


FIGURE 110: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae & Hepialidae).

1. *Chrysanympa formosa* (8904): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine-hardwood forest/grassland, netted shortly after dusk, 9 July 2023.
 2. *Chrysanympa formosa* (8904): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 10 July 2022.
 3. *Syngrapha viridisigma* (8904): WI Shawano County: Navarino Wildlife Area: open bog with tamarack and white pine, UV sheet 14, 5 August 2022.
 4. *Syngrapha microgramma* (8946): WI Shawano County: Navarino Wildlife Area: boardwalk through bog adjacent to hardwood swamp and sedge meadow, UV sheet 14, 23 June 2022.
 5. *Lithacodia musta* (9051): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland by sandstone cliffs, MV trap 4, 10 July 2020.
 6. *Cerma cora* (9061): WI Shawano County: Navarino Wildlife Area: sandy mesic to semi xeric oak-pine-hardwood forest, UV trap 11, 30 May 2022.
 7. *Cerma cora* (9061): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 May 2023.
 8. *Cerma cora* (9061): WI Shawano County: Navarino Wildlife Area: mesic to semi-xeric oak-pine-hardwood forest, UV trap 16, 23 May 2023.
 9. *Cerma cora* (9061): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 May 2023.
 10. *Oruza albocostaliata*, or species near (9025): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 11. *Sthenopsis thule* (0021): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 12. *Oruza albocostaliata*, or species near (9025): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 13. *Oruza albocostaliata*, or species near (9025): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 14. *Fagitana littera* complex (9629): WI Shawano County: Navarino Wildlife Area: high sedge meadow/hardwood swamp with *Osmunda claytoniana*, UV trap 13, 5 August 2022.
 15. *Fagitana littera* complex (9629): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 26 July 2023.
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FIGURE 111: Newly Recorded or Newly Reported Species for Outagamie County, WI (Noctuidae: Noctuinae: *Papaipema*).

1. *Papaipema circumlucens* (9491) ♀: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet, 23 August 2022.
 2. *Papaipema baptisiae* (9485) ♀: WI Outagamie County: Fallen Timbers: field/prairie planting, UV trap, 18 September 2022.
 3. *Papaipema baptisiae* (9485) ♂: WI Outagamie County: Mosquito Hill: prairie planting, UV trap, 1 September 2022.
 4. *Papaipema sciata* (9506) ♂: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap, 1 October 2021.
 5. *Papaipema sciata* (9506) ♀: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, UV sheet, 1 October 2022.
 6. *Papaipema harrisii* (9472) ♂: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap, 2 September 2021.
 7. *Papaipema aerata* (9468) ♂: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap, 15 September 2021.
 8. *Papaipema aerata* (9468) ♀: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap, 16 September 2022.
 9. *Papaipema aerata* (9468) ♀: WI Outagamie County: North Bluemound Drive Power Line Cut: field/prairie planting, UV trap, 3 October 2018.
 10. *Papaipema speciosissima* or species near (9482) ♂: WI Shawano County: Navarino Wildlife Area: hardwood swamp/sedge meadow, UV trap, 20 September 2022.
 11. *Papaipema speciosissima* or species near (9482) ♂: WI Outagamie County: Fallen Timbers: hydric hardwood forest with *Osmunda regalis*, UV trap, 20 September 2022.
 12. *Papaipema rigida* (9503) ♂: WI Outagamie County: North Bluemound Drive Power Line Cut: field/prairie planting, UV trap, 27 August 2019.
 13. *Papaipema nelita* species 1 (9502) ♂: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap, 23 August 2022.
 14. *Papaipema nelita* species 1 (9502) ♀: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, UV trap, 23 August 2022.
 15. *Papaipema rigida* (9503) ♀: WI Outagamie County: Fox Cities Paper Trail by Fox Valley Technical College: field/prairie planting, UV trap, 21 August 2022.
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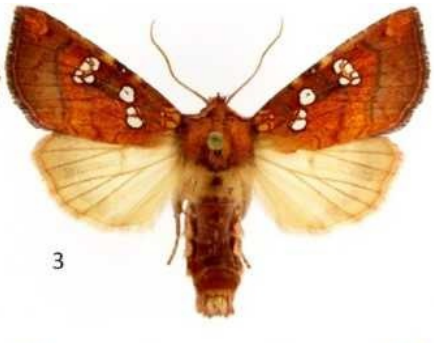


FIGURE 112: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae: Noctuinae).

1. *Apamea vultuosa* (9341): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, bait trail, 4 June 2021.
 2. *Apamea vultuosa* (9341): WI Outagamie County: Fallen Timbers: hydric hardwood forest, netted, 8 June 2020.
 3. *Apamea vultuosa* (9341): WI Outagamie County: Appleton: bait trail, 25 July 2019.
 4. *Apamea vultuosa* (9341): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, UV trap 6, 23 June 2022.
 5. *Apamea impulsa* (9360): WI Outagamie County: Appleton: bait trail, 10 July 2018.
 6. *Apamea plutonia* (9344): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 June 2023.
 7. *Apamea indocilis* (9362): WI Outagamie County: Appleton: bait trail, 12 July 2018.
 8. *Apamea indocilis* (9362): WI Shawano County: Navarino Wildlife Area: low sedge meadow with bog elements adjacent to xeric oak-pine uplands, UV trap 3, 23 June 2022.
 9. *Apamea indocilis* (9362): WI Shawano County: Navarino Wildlife Area: sandy mesic to semi xeric oak-pine-hardwood forest/field, netted in flight, 10 July 2022.
 10. *Apamea indocilis* (9362): WI Outagamie County: Appleton: bait trail, 12 July 2018.
 11. *Conservula anodonta* (9548): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 10 July 2022.
 12. *Photedes includens* (9434): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 2 August 2022.
 13. *Photedes panatela* (9436): WI Outagamie County: Fallen Timbers: open hydric hardwood forest, MV trap 21, 18 June 2021.
 14. *Photedes near enervata* (9441.1): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV trap 10, 4 August 2021.
 15. *Photedes near enervata* (9441.1): WI Outagamie County: Mosquito Hill: floodplain forest edge/prairie planting, UV trap 7, 24 July 2020.
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FIGURE 113: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae: Noctuinae).

1. *Oligia crytora* (9410): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 22 June 2022.
 2. *Oligia crytora* (9410): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, UV trap 18, 8 June 2020.
 3. *Oligia crytora* (9410): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, UV trap 18, 8 June 2020.
 4. *Oligia obtusa* (9418): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, UV trap 19, 27 July 2021.
 5. *Oligia obtusa* (9418): WI Shawano County: Navarino Wildlife Area: boardwalk through bog adjacent to hardwood swamp and sedge meadow, UV sheet 14, 5 August 2022.
 6. *Oligia obtusa* (9418): WI Outagamie County: Mosquito Hill: floodplain forest edge/prairie planting, UV trap 7, 24 July 2020.
 7. *Oligia obtusa* (9418): WI Outagamie County: Mosquito Hill: floodplain forest edge/prairie planting, UV trap 7, 24 July 2020.
 8. *Oligia chlorostigma* (9402): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, MV trap 6, 5 July 2022.
 9. *Oligia chlorostigma* (9402): WI Outagamie County: Mosquito Hill: prairie planting between hill and floodplain, MV sheet 23, 22 July 2022.
 10. *Oligia brighami* (9415): WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 2 August 2022.
 11. *Hydraecia stramentosa* (9516): WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 20 August 2021.
 12. *Hydraecia stramentosa* (9516): WI Outagamie County: Appleton: MV trap, 16 August 2019.
 13. *Conservula anodonta* (9548): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, UV trap 6, 10 July 2022.
 14. *Conservula anodonta* (9548): Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 10 July 2022.
 15. *Conservula anodonta* (9548): Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 10 July 2022.
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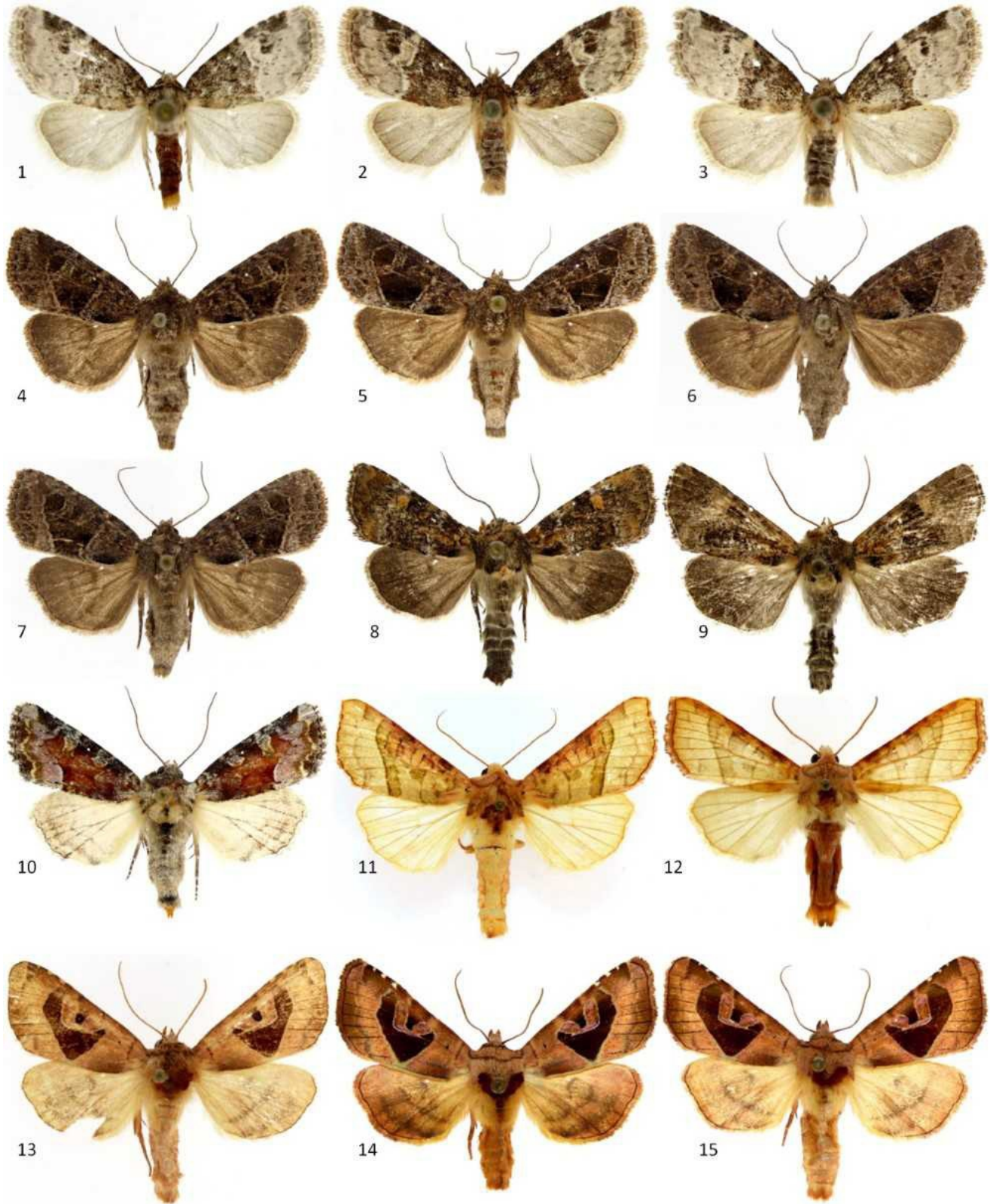


FIGURE 114: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae: Noctuinae).

1. *Lithophane franclemonti* (9887.1): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 4 November 2020.
 2. *Lithophane franclemonti* (9887.1): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 9 November 2020.
 3. *Lithophane franclemonti* (9887.1): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 9 November 2020.
 4. *Lithophane thaxteri* (9928): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 21 April 2022.
 5. *Xylena nupera* (9873): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 7 April 2020.
 6. *Epiglaea decliva* (9946): WI Outagamie County: Fallen Timbers: hydric hardwood forest opening, UV trap 5, 24 September 2018.
 7. *Hillia iris* (9967): WI Winnebago County: Wiouwash Trail just south of Outagamie County border, sedge meadow/shrubby wetland, UV trap, 18 September 2020.
 8. *Hillia iris* (9967): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, UV trap 21, 29 May 2022.
 9. *Sideridis congermana* (10266): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 30 May 2022.
 10. *Dardiga rubripennis* (10434): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, UV sheet 10, 22 July 2022.
 11. *Dardiga rubripennis* (10434): WI Outagamie County: Appleton: bait trail, 5 August 2018.
 12. *Dardiga rubripennis* (10434): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 28 August 2022.
 13. *Protorthodes incincta* (10552): WI Outagamie County: Mosquito Hill: wet-mesic prairie planting/floodplain forest edge, bait trail, 1 September 2022.
 14. *Protorthodes incincta* (10552): WI Outagamie County: Mosquito Hill: wet-mesic prairie planting/floodplain forest edge, bait trail, 1 September 2022.
 15. *Lacinipolia vicina* (10394): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 10 July 2022.
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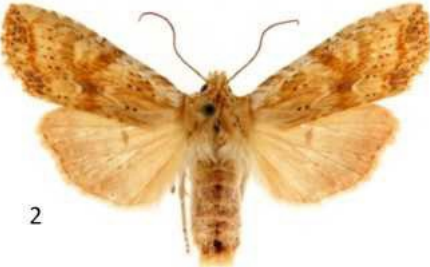


FIGURE 115: Newly Recorded Species for Outagamie County and Adjacent Areas (Noctuidae: Noctuinae).

1. *Agrotis vetusta* (10641): WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland, 2 September 2020.
 2. *Agrotis vetusta* (10641): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 28 August 2022.
 3. *Agrotis vetusta* (10641): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 28 August 2022.
 4. *Agrotis stigmosa* (10658): WI Outagamie County: Mosquito Hill: mesic hardwood pine forest at base of hill/field near obstacle course, UV trap 19, 20 May 2022.
 5. *Agrotis stigmosa* (10658): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, UV trap 6, 22 May 2021.
 6. *Agrotis stigmosa* (10658): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, UV trap 17, 17 May 2021.
 7. *Agrotis stigmosa* (10658): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 31 May 2023.
 8. *Striacosta albicosta* (10878): WI Outagamie County: Appleton: bait trail, 6 November 2016.
 9. *Striacosta albicosta* (10878): WI Outagamie County: Appleton: MV trap, 16 August 2018.
 10. *Hemipachnobia monochromeata* (10993.1): WI Shawano County: Navarino Wildlife Area: boardwalk through bog adjacent to hardwood swamp and sedge meadow, UV sheet 14, 23 June 2022.
 11. *Hemipachnobia monochromeata* (10993.1): WI Shawano County: Navarino Wildlife Area: boardwalk through bog adjacent to hardwood swamp and sedge meadow, UV sheet 14, 23 June 2022.
 12. *Cerastis fishii* (10997): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 2 August 2022.
 13. *Eucoptcnemis fimbrialis* (10694): WI Shawano County: Navarino Wildlife Area: oak-pine forest edge by sandy oak-pine barrens, flew to oak leaf and landed, 8 September 2022.
 14. *Eucoptcnemis fimbrialis* (10694): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, UV trap 10, 8 September 2022.
 15. *Euxoa scandens* (10715): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 23 June 2023.
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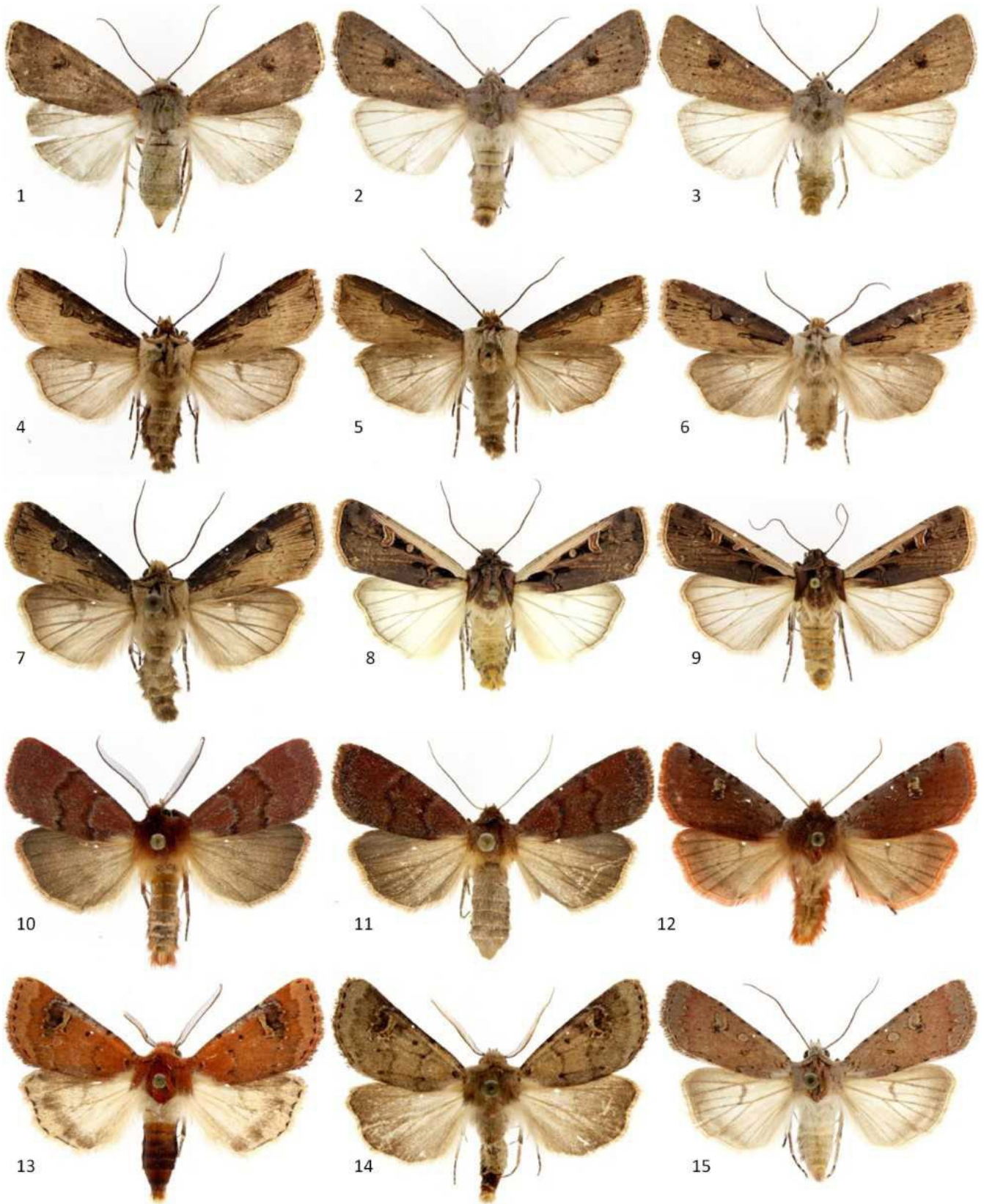


FIGURE 116: Rhopalocera: 1-5: *Pompeius verna*, a southern species that has expanded its range north; 6-8: *Coenonympha inornata*, the only northern species that has expanded its range south into Outagamie County; 9-11: Two species recorded from Outagamie County by single specimens that were recently found at the Navarino Wildlife Area.

1. *Pompeius verna* (4048) ♂: WI Outagamie County: Mosquito Hill: nectaring on *Monarda didyma* in garden by parking lot, 5 July 2021.

2. *Pompeius verna* (4048) ♀: WI Outagamie County: Mosquito Hill: nectaring on *Monarda didyma* in garden by parking lot, 5 July 2021.

3. *Pompeius verna* (4048) ♀: WI Outagamie County: Mosquito Hill: field east of prairie planting, 12 July 2021.

4. *Pompeius verna* (4048) ♀: WI Outagamie County: Mosquito Hill: nectaring on *Monarda didyma* in garden by parking lot, 5 July 2021.

5. *Pompeius verna* (4048) ♀: WI Outagamie County: Mosquito Hill: nectaring on *Monarda didyma* in field east of prairie planting, 12 July 2021.

6. *Coenonympha inornata* (4583): WI Menominee County: North side of Highway VV X Rainbow Road, xeric oak-pine forest edge/roadside grassland, 6 June 2017.

7. *Coenonympha inornata* (4583): Same individual as Number 6 (underside).

8. *Coenonympha inornata* (4583): WI Outagamie County: Fallen Timbers: meadow with prairie planting, 2 July 2021.

9. *Amblyscirtes hegon* (4096): WI Shawano Co: Navarino Wildlife Area: sandy road through xeric oak-pine forest near fields and barrens, 7 June 2022.

10. *Amblyscirtes hegon* (4096): Same individual as Number 9 (underside).

11. *Callophrys henrici* (4326): WI Shawano Co: Navarino Wildlife Area: intermediate succession scrubby oak-pine woodland with barrens openings on north side of bog, 21 May 2023.



FIGURE 117: Newly Recorded Microlepidoptera Species for Outagamie County (Choreutidae, Tortricidae, & Pyralidae).

#=New colonization by a species apparently moving its range north, found reliably in at least one locality where it was not found from 1989-1995.

#1. *Tebenna silphiella* (2642): WI Outagamie County: Mosquito Hill: mesic prairie planting, on leaves of *Silphium integrifolium*, nocturnal, 4 July 2021.

#2. *Eucosma giganteana* (3098): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, MV trap 6, 3 July 2021.

#3. *Eucosma bilineana* (3100): WI Outagamie County: Fox Cities Paper Trail by Fox Valley Technical College: field with prairie planting, UV trap, 3 July 2023.

Note: This species was first found in the area in 2022 at Mosquito Hill.

#4. *Eucosma bilineana* (3100): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, UV sheet 10, 5 July 2022.

#5. *Eucosma sombreana* (3127): WI Outagamie County: Mosquito Hill: hillside near top, mesic hardwood forest/sandstone cliffs near grassland, UV trap 28, 18 July 2023.

#6. *Aethes spartinana* (3851): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 18 July 2023.

#7. *Aethes spartinana* (3851): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 18 July 2023.

8. *Parapediasia decorellus* (5450): WI Outagamie County: Mosquito Hill: upland prairie planting/mesic hardwood forest edge, MV trap 6, 5 July 2022.

9. *Parapediasia decorellus* (5450): WI Outagamie County: Mosquito Hill: mesic hardwood-pine forest at base of hill/field near obstacle course, UV trap 19, 18 July 2021.

#10. *Haimbachia squamulellus* (5482): WI Outagamie County: Appleton: UV lights, 1 July 2023.

#11. *Haimbachia squamulellus* (5482): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 18 July 2023.

#12. *Haimbachia squamulellus* (5482): WI Outagamie County: Appleton: UV lights, 24 June 2023.

13. *Eoreuma crawfordi* (5498): WI Outagamie County: Appleton: UV lights, 14 July 2023.

Note: The first area records are from 2023 at Mosquito Hill and Appleton.

#14. *Eoreuma densellus* (5492): WI Outagamie County: Appleton, UV trap, 12 June 2021.

#15. *Macalla zelleri* (5579): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 18 July 2023.

#16. *Tebenna silphiella* (2642): WI Outagamie County: Mosquito Hill: mesic prairie planting, on leaves of *Silphium integrifolium*, nocturnal, 4 July 2021.

17. *Apotomis apateticana* (2764)? or close: WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland by sandstone cliffs, UV trap 4, 5 July 2022.

18. *Meroptera cviatella* (5786): WI Outagamie County: Appleton: MV trap, 14 July 2019.

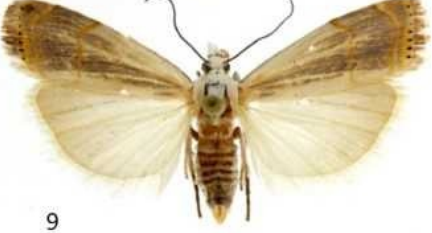
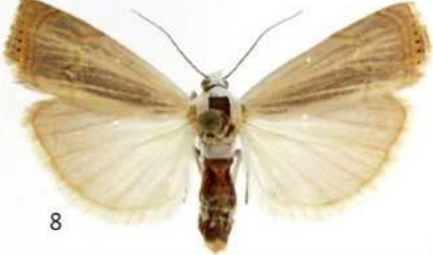


FIGURE 118: Two species going under the name *Prochoerodes lineola* from the Outagamie County Area (Geometridae: Ennominae).

Species 1: Multivoltine, migratory, widespread in Wisconsin and the eastern United States. Plain brown with little infraspecific variation, other than minor sexual dimorphism (females have a slight violet cast). Recorded from late May through early November in Outagamie County.

Species 2: Univoltine resident of the Northern Transition and Canadian Zones. Highly variable, with yellow and brown forms. Brown forms are lighter than species 1. The peak flight is late July and early August, with worn individuals sometimes present up to late August.

1. *Prochoerodes lineola* complex species 1 (6982) ♀: WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 6 September 2020.
2. *Prochoerodes lineola* complex species 1 (6982) ♀: WI Outagamie County: Fallen Timbers: hydric hardwood forest, UV trap 24, 20 September 2021.
3. *Prochoerodes lineola* complex species 1 (6982) ♀: WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 21 September 2021.
4. *Prochoerodes lineola* complex species 1 (6982) ♂: WI Outagamie County: Appleton: MV trap, 2 July 2017.
5. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
6. *Prochoerodes lineola* complex species 2 (6982) ♀: WI Shawano County: Navarino Wildlife Area: sandy mesic-xeric oak-pine-hardwood forest/grassland, bait trail, 5 August 2022.
7. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, bait trail, 5 August 2022.
8. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 5 August 2022.
9. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
10. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: bog boardwalk near hardwood swamp with sedges and ferns, UV sheet 14, 5 August 2022.
11. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 2 August 2022.
12. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, bait trail, 5 August 2022.
13. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, bait trail, 2 August 2022.
14. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 5 August 2022.
15. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 26 July 2023.
16. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
17. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
18. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 2 August 2022.
19. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, bait trail, 5 August 2022.
20. *Prochoerodes lineola* complex species 2 (6982) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, bait trail, 5 August 2022.
21. *Prochoerodes lineola* complex species 1 (6982) ♂: WI Outagamie County: Appleton: UV lights, 11 July 2017.
22. *Prochoerodes lineola* complex species 1 (6982) ♂: WI Outagamie County: Appleton: UV lights, 14 September 2017.
23. *Prochoerodes lineola* complex species 1 (6982) ♂: WI Outagamie County: Appleton: bait trail, 4 September 2017.
24. *Prochoerodes lineola* complex species 1 (6982) ♀: WI Outagamie County: Appleton: UV lights, 6 July 2017.

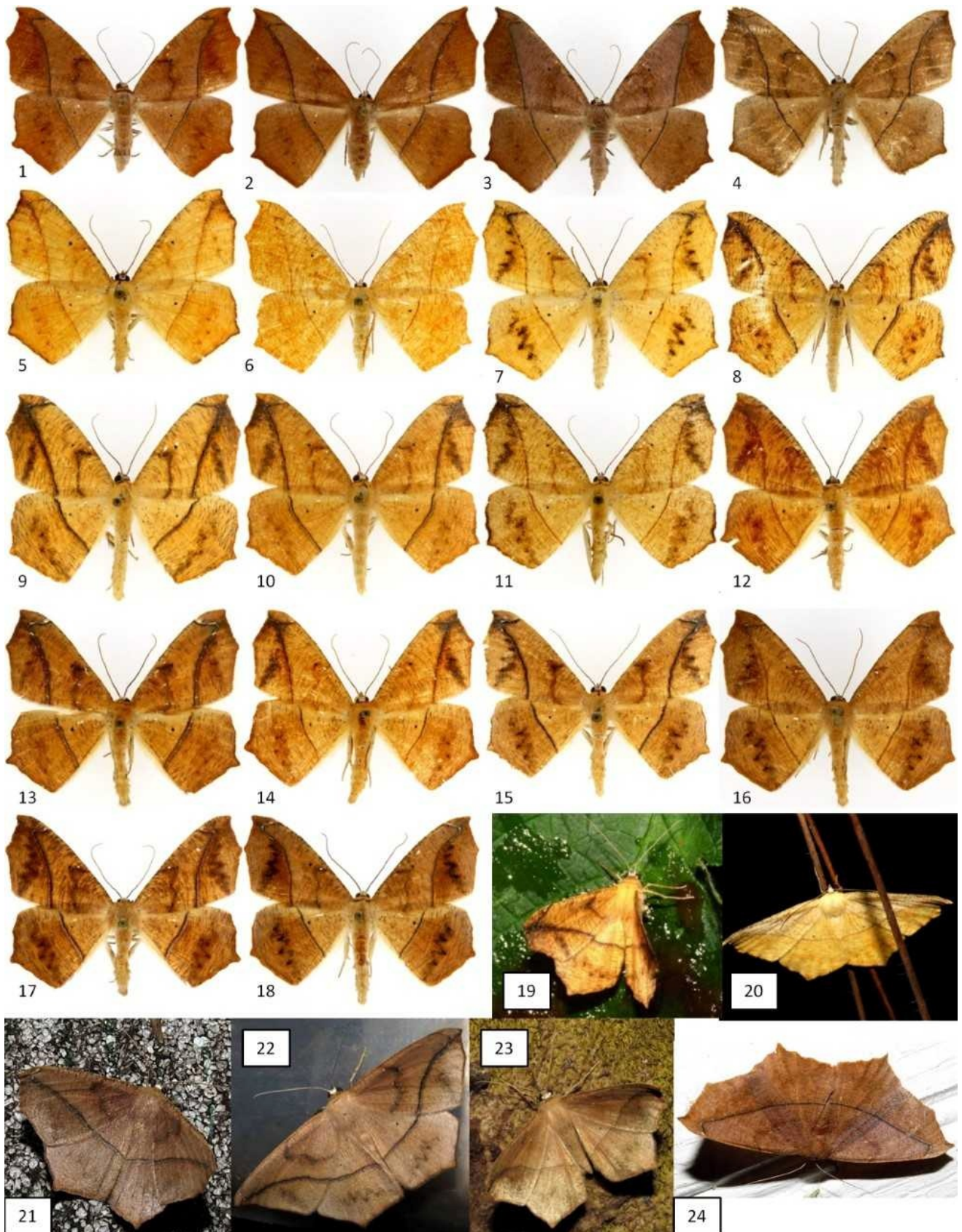


FIGURE 119: The *Idia aemula* complex in the Outagamie County Area (Noctuidae: Herminiinae).

Based on pattern, size, and distribution I think there are three *aemula* complex species in Outagamie County. *Idia concisa* has the lightest hindwing coloration, and richer forewing coloration. I apply the name *herminoides* based on the Smithsonian collection, which has a specimen with black reniform and orbicular spots identified under this name (pers. obsv., 1998). *Idia herminoides* is polymorphic for the reniform and orbicular spots being black or orange, whereas they are always orange in the other two species. Orange-spotted *herminoides* may be difficult to separate from *aemula*, but they generally comprise the smaller of two size classes where they are sympatric, and tend to have a lighter more contrasting hindwing. *Idia herminoides* occurs primarily in the Southern Transition and Upper Austral Zones, but is apparently absent from the Canadian and Lower Austral Zones. *Idia aemula* and *Idia concisa* occur throughout eastern Wisconsin.

Note: Numbers 2-3 & 5-6 were photographed together in the same frame

1. *Idia aemula* (8323): WI Outagamie County: Appleton: MV trap, 17 June 2019.
 2. *Idia aemula* (8323): WI Outagamie County: Appleton: MV trap, 23 June 2019.
 3. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: bait trail, 23 June 2019.
 4. *Idia aemula* (8323): WI Outagamie County: Appleton: MV trap, 26 August 2017.
 5. *Idia aemula* (8323): WI Outagamie County: Appleton: MV trap, 17 June 2019.
 6. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: bait trail, 22 June 2019.
 7. *Idia aemula* (8323): WI Outagamie County: Appleton: bait trail, 30 June 2017.
 8. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: MV trap, 22 June 2019.
 9. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: bait trail, 23 June 2019.
 10. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: MV trap, 13 July 2019.
 11. *Idia herminoides* (8323.2): WI Outagamie County: North Bluemound Drive Power Line Cut: UV trap, 4 September 2018.
 12. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: bait trail, 13 July 2018.
 13. *Idia herminoides* (8323.2): WI Outagamie County: Appleton: bait trail, 13 July 2019.
 14. *Idia concisa* (8323.1): WI Outagamie County: Appleton: MV trap, 18 June 2017.
 15. *Idia concisa* (8323.1): WI Outagamie County: Appleton: bait trail, 10 August 2017.
 16. *Idia aemula* (8323): WI Outagamie County: Appleton: bait trail, 30 June 2017 (=Number 7).
 17. *Idia herminoides* (8323.2): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 11 July 2020.
 18. *Idia concisa* (8323.1): WI Outagamie County: Appleton: bait trail, 8 July 2017.
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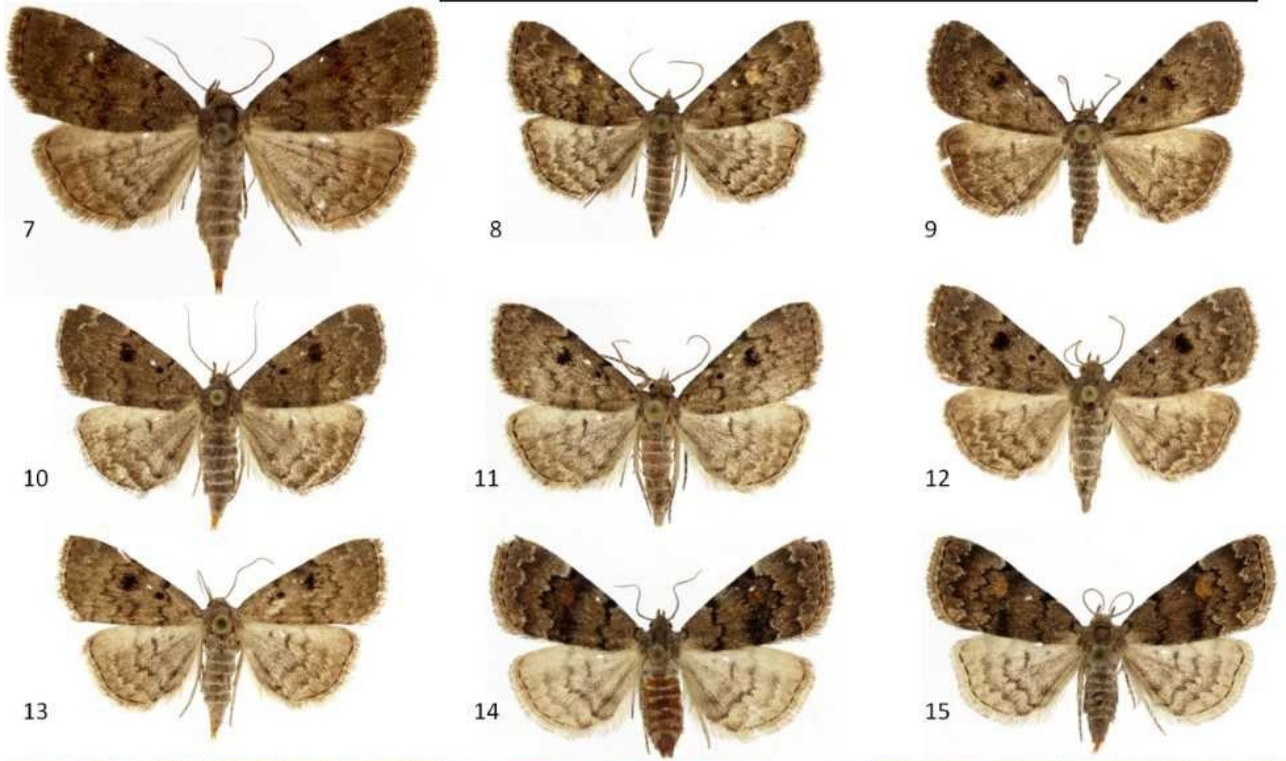
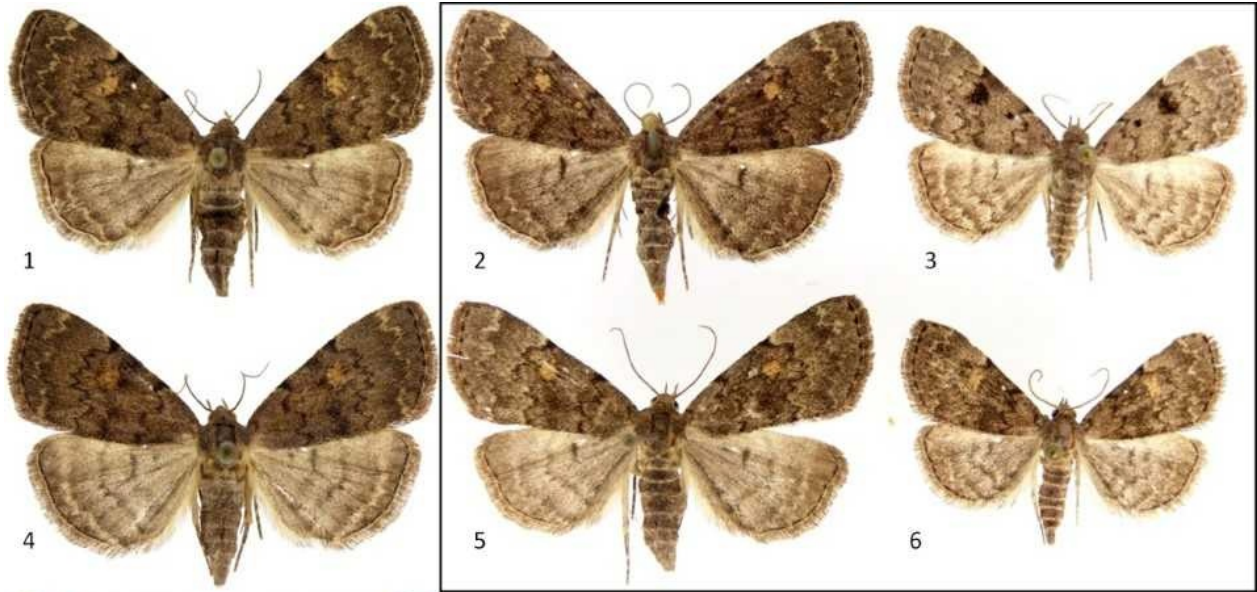


FIGURE 120: *Zanclognatha* Species Recorded from the Outagamie County Area and Wisconsin (part) (Noctuidae: Herminiinae).

Zanclognatha near *lituralis* is smaller and more brownish than *Z. lituralis*, which is greyer. Unlike most *Zanclognatha* species, each of these species forms a divergent clade with COI 5' sequences. *Zanclognatha lituralis* is widespread in eastern North America and occurs throughout Wisconsin, whereas near *lituralis* is an Austral Zone species that rarely strays into Wisconsin, as suggested by isolated captures of worn specimens.

Zanclognatha deceptricalis is a larger (21-24 mm wingspan), darker grey species than sympatric *Zanclognatha inconspicualis*, which is a light greyish tan species with a wingspan of 17-20 mm. In *Zanclognatha deceptricalis*, there is a long straight area in the forewing postmedial (pm) line where it angles distally below the costa, forming a sharp obtuse angle with the costal portion of the line. These sections of the postmedial line tend to form a smoother concave arc in *Z. inconspicualis*, as in a photo of a syntype that I examined. The holotype of *deceptricalis* is drooped but has a wingspan of about 24 mm and the pm line forms an obtuse angle. However, a photo of this type suggests the color is brownish, which can be explained by the 1884 date of the specimen. I have examined many *Catocala* collected in the late 1800s and compared them with recently collected specimens of the same species, revealing that there is a dramatic color shift from grey to brown in specimens this old. In specimens from northwestern Wisconsin the anterior part of the pm line is straighter, forming a slighter concave arc, consistent with the holotype of *Zanclognatha theralis*. In other respects *theralis* and *inconspicualis* phenotypes are similar, and they may be variants of the same species. *Zanclognatha gypsalis* has contrasting darker shading between the postmedial line and outer margin, and is sympatric with *inconspicualis* in the Canadian Zone of the WV Appalachians. I have not found *gypsalis* in Wisconsin but include it for comparison.

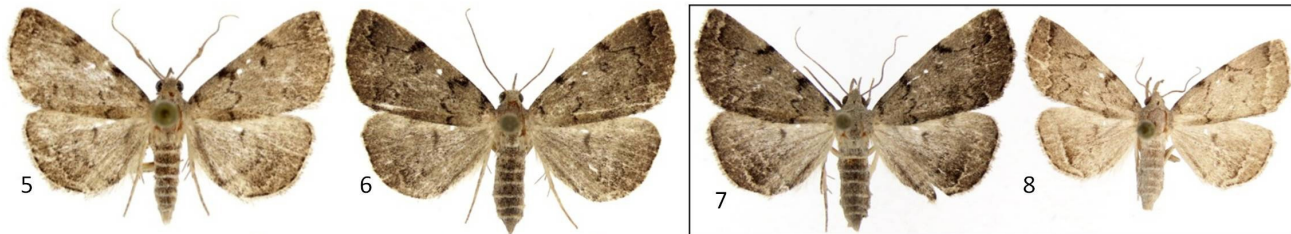
Zanclognatha cruralis species A is a univoltine, pale tan species. Species B is multivoltine and is smaller than species A. Species B has two color phenotypes of uncertain taxonomic status, including a darker brownish tan phenotype (No. 22) and a reddish brown phenotype (No. 23). Outagamie County specimens are the brownish tan phenotype, but I have found the reddish brown phenotype in southern Wisconsin (Dane County).

Zanclognatha pedipilalis species A is a univoltine, pale tan to brownish tan species, whereas species B is a multivoltine, smaller, and darker species.

WINGSPAN (mm) OF SPREAD WI SPECIMENS: *lituralis* (22-24), near *lituralis* (21), *deceptricalis* (21-24), *inconspicualis* (17-20), *theralis* (18-20), *pedipilalis* species A (27-31), *pedipilalis* species B (22-23), *laevigata* (27-32), *cruralis* species A (28-31), *cruralis* species B (24-26).

NOTE: Numbers 7 and 8 were photographed together in the same frame, so relative differences in size and color are not influenced by photographic variables.

- 1. *Zanclognatha lituralis* (8340):** WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 22 June 2022.
- 2. *Zanclognatha lituralis* (8340):** WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
- 3. *Zanclognatha lituralis* (8340):** WI Outagamie County: power line cut N of Allean Road: UV trap, sedge meadow: 18 June 2020.
- 4. *Zanclognatha near lituralis* (8340.1):** WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 24 August 2021.
- 5. *Zanclognatha deceptricalis* (8341.1):** WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 26 July 2023.
- 6. *Zanclognatha deceptricalis* (8341.1):** WI Door County: Sunset Drive near Baileys Harbor: boreal forest, UV trap 1, 18 August 2017.
- 7. *Zanclognatha deceptricalis* (8341.1):** WI Door County: Sunset Drive near Baileys Harbor: boreal forest/open-shrubby wetlands, MV sheet, 18 August 2017.
- 8. *Zanclognatha inconspicualis* (8344):** WI Door County: Sunset Drive near Baileys Harbor: boreal forest/open-shrubby wetlands, MV sheet, 19 August 2017.
- 9. *Zanclognatha gypsalis* (8342):** WV Pochahontas County: Monangahela National Forest Road 102: boggy spruce forest/mesic hardwoods, MV sheet, 7 July 2002, Kons & Borth.
- 10. *Zanclognatha theralis* (8341):** WI Burnett County, Namekogan Barrens, oak-pine barrens, UV sheet, 5 August 1995.
- 11. *Zanclognatha inconspicualis* (8344):** WI Door County: Sunset Drive near Baileys Harbor: boreal forest/open-shrubby wetlands, MV sheet, 19 August 2017.
- 12. *Zanclognatha inconspicualis* (8344):** WI Outagamie County: Appleton: MV trap, 6 July 2018.
- 13. *Zanclognatha inconspicualis* (8344):** WI Door County: Sunset Drive near Baileys Harbor: boreal forest/open-shrubby wetlands, MV sheet, 18 August 2017.
- 14. *Zanclognatha pedipilalis* complex species A (8348a):** WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
- 15. *Zanclognatha pedipilalis* complex species A (8348a):** WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 8 June 2020.
- 16. *Zanclognatha pedipilalis* complex species A (8348a):** WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 8 June 2020.
- 17. *Zanclognatha pedipilalis* complex species B (8348b):** WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 5 August 2023.
- 18. *Zanclognatha pedipilalis* complex species B (8348b):** IN Posey County: Hovey Lake Wildlife Management Area: field/hydric hardwood forest, MV sheet 2, 2 September 2015, Kons & Borth.
- 19. *Zanclognatha laevigata* (8345):** WI Outagamie County: Mosquito Hill: mesic hardwood forest, bait trail on hill, 10 July 2020.
- 20. *Zanclognatha laevigata* (8345):** WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland, 24 July 2020.
- 21. *Zanclognatha cruralis* complex species A (8351a):** WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest, bait trail, 3 June 2020.
- 22. *Zanclognatha cruralis* complex species B (8351b):** WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, bait trail, 5 August 2023.
- 23. *Zanclognatha cruralis* complex species B (8351b):** WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 24 August 2021.



**FIGURE 121: *Zanclognatha* Species Recorded from the Outagamie County Area (part)
(Noctuidae: Herminiinae).**

Nominotypical *Zanclognatha protummalis* is a light tan to brownish tan species with the forewing lines diffuse, especially in females. *Zanclognatha protummalis* species 2 is darker grey and the postmedial and antemedial lines are accented with black, and it usually has a black reniform spot. Species 2 looks like a miniature *Z. dentata* (No. 6 & 9) or an intermediate between *dentata* and *protummalis* (No. 12); in corresponding genders the black accents of the lines tend to be less pronounced, but size is the most reliable means of separation without DNA (COI 5' sequences separated the two species where they were collected together in Door County). *Zanclognatha dentata* sometimes has a prominent blackish patch on the basal side of the postmedial line posterior of the reniform (No. 5 & 7), whereas this patch is faint or absent in species 2. *Zanclognatha martha* is larger and more brownish than species 2, and has less black accents on the postmedial and antemedial lines posterior of the costa than *dentata*. *Zanclognatha protummalis* species 3 differs from the aforementioned by having a contrasting cream colored subterminal line, like *marcidilinea*. Compared with *marcidilinea*, species 3 is smaller, has a darker brownish tan forewing, and a darker hindwing.

Zanclognatha dentata, *Z. protummalis*, and *Z. protummalis* species 2 are sympatric in Outagamie County and northeastern Wisconsin. *Zanclognatha dentata* and *Z. protummalis* range south into the Upper Austral Zone, whereas *Z. protummalis* species 2 occurs primarily in the Canadian Zone, with scattered records in the Transition Zone. *Zanclognatha marcidilinea* and *Z. protummalis* species 3 are sympatric in the Austral Zone. Unlike *marcidilinea*, species 3 ranges south into peninsular Florida, and unlike species 3, *marcidilinea* ranges north into the Canadian Zone. Species 3 appears to be a rare stray in the Transition Zone, where *marcidilinea* is common and widespread.

WINGSPAN (mm) OF SPREAD WI SPECIMENS: *martha* (25-30); *dentata* (25-29); *protummalis* sp. 2 (20-23); *protummalis* (20-23); *ochreipennis* (27-30); *marcidilinea* (27-31); *protummalis* sp. 3 (26).

NOTE: Numbers 11-12 were photographed together in the same frame, so relative differences in size and color are not influenced by photographic variables. Number 12 is my largest specimen of *protummalis* species 2.

1. *Zanclognatha martha* (8350) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 June 2023, common.
 2. *Zanclognatha martha* (8350) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 June 2023.
 3. *Zanclognatha martha* (8350) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 23 June 2022.
 4. *Zanclognatha martha* (8350) ♀: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 18 July 2023.
 5. *Zanclognatha dentata* (8349.1) ♂: WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland, 1 July 2020.
 6. *Zanclognatha protummalis* complex species 2 (8349.2) ♀: WI Door County: Sunset Drive: boreal forest/wetland, MV sheet, 18 August 2017.
 7. *Zanclognatha dentata* (8349.1) ♂: WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, UV trap 10, 26 July 2023.
 8. *Zanclognatha dentata* (8349.1) ♀: WI Door County: Lake Michigan shore, grass/sedge wetland, UV trap 3, 18 August 2017.
 9. *Zanclognatha protummalis* complex species 2 (8349.2) ♂: WI Outagamie County: Fallen Timbers: hydric hardwood forest, UV trap 9, 10 August 2019.
 10. *Zanclognatha ochreipennis* (8353) ♂: WI Outagamie County: Mosquito Hill: MV sheet 10, 18 July 2023.
- Note: I refer to this species by its junior synonym, *ochreipennis*, as the oldest name, *jacchusalis*, has been extensively applied to the species now known as *marcidilinea*.
11. *Zanclognatha dentata* (8349.1) ♀: WI Door County: Sunset Drive: boreal forest, UV Trap 1, 18 August 2017.
 12. *Zanclognatha protummalis* complex species 2 (8349.2) ♀: WI Door County: Sunset Drive: boreal forest, UV Trap 1, 18 August 2017.
 13. *Zanclognatha ochreipennis* (8353) ♀: WI Outagamie County: Appleton: bait trail, 23 July 2019.
 14. *Zanclognatha protummalis* (8349) ♂: WI Outagamie County: Appleton: MV trap, 16 June 2017.
 15. *Zanclognatha protummalis* (8349) ♀: WI Outagamie County: Mosquito Hill: hillside mesic hardwood forest/grassland, 1 July 2020.
 16. *Zanclognatha marcidilinea* (8352) ♀: WI Outagamie County: Mosquito Hill: bait trail on hill, 24 July 2020.
 17. *Zanclognatha marcidilinea* (8352) ♂: WI Outagamie County: Old Stone Bridge Trail: bait trail, 16 June 2020.
 18. *Zanclognatha protummalis* complex species 3 (8348.3) ♂: WI Outagamie County: Old Stone Bridge Trail: mesic to hydric hardwood forest/fields, bait trail, 16 June 2020.



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FIGURE 122: *Chytolita morbidalis* and *Chytolita petrealis* (Noctuidae: Herminiinae).

Chytolita specimens have two size classes with differences in phenology and distribution, thus I consider them to comprise two species. With specimens spread as shown on the plate, in Wisconsin *Chytolita morbidalis* has a wing span of 31-34mm, whereas *C. petrealis* has a wing span of 23-26mm, typically 24-25mm. There are no consistent wing pattern differences, but *C. petrealis* has a form with a solid black reniform (numbers 7-8), whereas *C. morbidalis* does not. On the average *C. morbidalis* is paler, but there is lots of overlap.

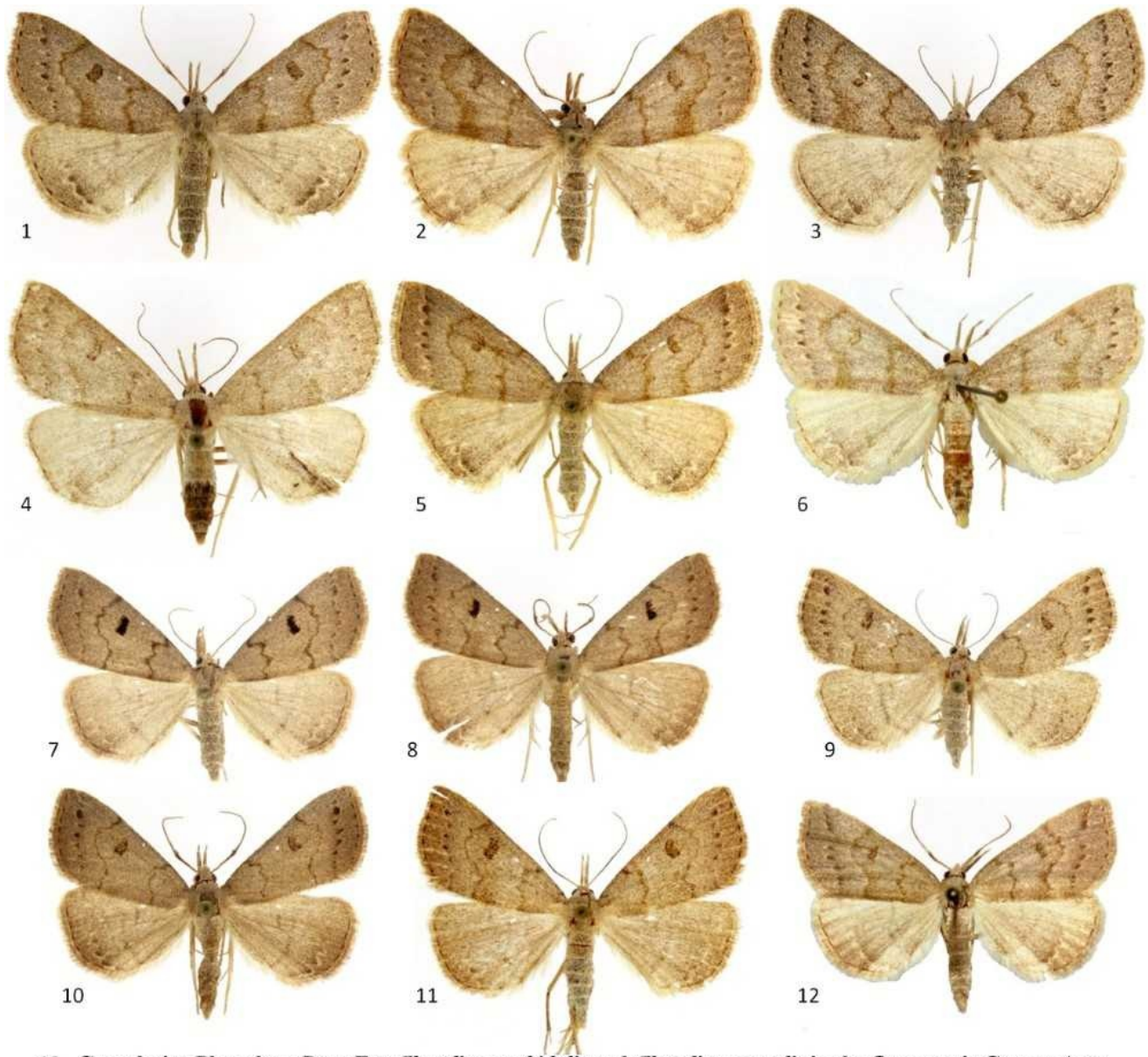
In Wisconsin both species are univoltine, with *C. morbidalis* emerging first. The flight seasons overlap, but *C. morbidalis* are worn when *C. petrealis* are fresh. The cumulative phenology for the Outagamie County area is shown in Figure 122: 13.

The relative abundances of both species differ markedly between Mosquito Hill and Fallen Timbers. As of 2022, I have 237 individuals of *morbidalis* databased for Mosquito Hill, versus 32 for *petrealis*. For Fallen Timbers there are 201 individuals of *petrealis* versus 4 individuals of *morbidalis*.

Both species occur throughout Wisconsin, but *C. petrealis* ranges farther south, and is a resident species as far south as the central Florida panhandle, as reported in Kons and Borth (2006). I have seen only one worn specimen of *C. morbidalis* from Florida, which is probably a stray. The farthest south I have found *C. morbidalis* in numbers /fresh condition is Atlanta State Park in Cass County, northeast Texas (Kons & Borth surveys).

Note: Numbers 6 and 12 were photographed with a flash, while the remainder were not.

1. *Chytolita morbidalis* (8355): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 3 June 2020.
 2. *Chytolita morbidalis* (8355): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 3 June 2020.
 3. *Chytolita morbidalis* (8355): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 3 June 2020.
 4. *Chytolita morbidalis* (8355): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 3 June 2020.
 5. *Chytolita morbidalis* (8355): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
 6. *Chytolita morbidalis* (8355): WI Outagamie County: Mosquito Hill: 11 June 1993.
 7. *Chytolita petrealis* (8356): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
 8. *Chytolita petrealis* (8356): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
 9. *Chytolita petrealis* (8356): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
 10. *Chytolita petrealis* (8356): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
 11. *Chytolita petrealis* (8356): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 18 June 2021.
 12. *Chytolita petrealis* (8356): WI Douglas County: spruce-tamarack bog, T43N R 12W Sec 36, UV trap, 21 June 1996, Kons & Borth.
 13. **Cumulative Phenology Data for *Chytolita morbidalis* and *Chytolita petrealis* (8356) in the Outagamie County Area.**
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13. Cumulative Phenology Data For *Chytolita morbidalis* and *Chytolita petrealis* in the Outagamie County Area.

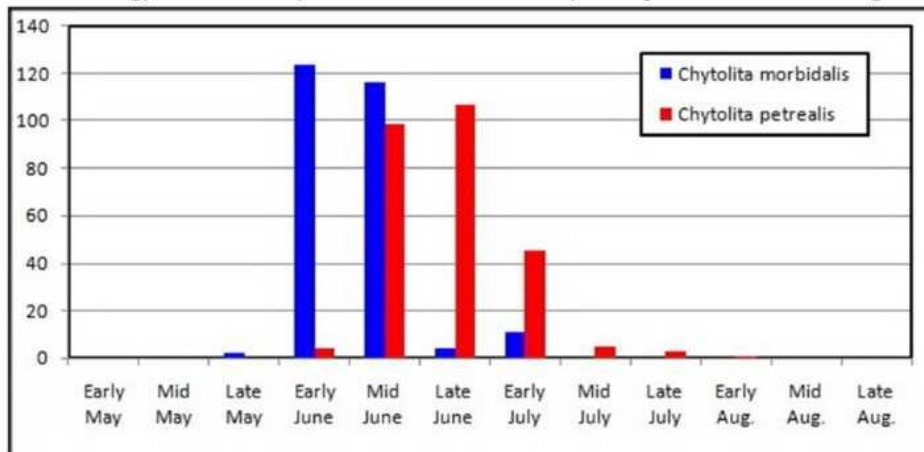


FIGURE 123: *Hyphenodes* Species Recorded from Outagamie County (Noctuidae: Hyphenodinae).

There are two size classes of *Hyphenodes*. The larger size class includes *caducus*, *sombrus*, and species 1, whereas the smaller size class includes *fractilinea*, near *fractilinea*, *palustris*, and *franclemonti*. *Caducus* is polymorphic as confirmed with COI 5' sequences, with a typical contrasting form (Numbers 1-3, 7) and a plainer, dark form (Numbers 4-6) which is very similar to *sombrus*. *Sombrus* has a subtle smoother appearance than the dark forms of *caducus*. Species 1 is patterned similar to *fractilinea* but is the size of *caducus*; unfortunately, this phenotype has not been successfully sequenced to my knowledge. *Franclemonti* has a notch in the postmedial line across from the reniform, a sinusoidal shaped postmedial line posterior to the reniform (angled in the other species), and a dark patch between the postmedial and antimedial lines along the lower forewing margin. *Fractilinea* is light grey with little contrast basal to the postmedial line. Near *fractilinea* is more brownish with a contrasting dark bar on the basal side of the postmedial line posterior to the reniform. *Palustris* is a darker grey than the other species in the smaller size class, and also has the contrasting dark bar present in near *fractilinea*.

1. *Hyphenodes caducus* (8420): WI Outagamie County: Fallen Timbers: open hydric hardwood forest, MV trap 10, 31 July 2020.
2. *Hyphenodes caducus* (8420): WI Outagamie County: Fallen Timbers: open hydric hardwood forest, MV trap 10, 31 July 2020.
3. *Hyphenodes caducus* (8420): WI Outagamie County: Appleton: MV trap, 23 June 2019.
4. *Hyphenodes caducus* (8420): WI Outagamie County: Appleton: MV trap, 26 July 2017.
5. *Hyphenodes caducus* (8420): WI Outagamie County: Appleton: MV trap, 25 June 2019; Sequence Voucher Sample ID Number: 25004-COI-2020.
6. *Hyphenodes caducus* (8420): WI Outagamie County: Appleton: bait trail, 1 August 2022.
7. *Hyphenodes caducus* (8420): WI Outagamie County: sedge meadow north of Allcan Road, UV trap, 18 June 2020; Sequence Voucher Sample ID Number: 25005-COI-2020. Photographed with a flash.
8. *Hyphenodes sombrus* (8423): WI Outagamie County: Mosquito Hill: sedge meadow in floodplain forest, UV trap, 13 August 1994.
9. *Hyphenodes sombrus* (8423): WI Forest County: Armstrong Creek Bog: UV trap, 28 August 1995. This is a GT Vision image.
10. *Hyphenodes species 1* (8420.1): WI Outagamie County: Appleton: MV trap, 11 August 2017.
11. *Hyphenodes species 1* (8420.1): WI Outagamie County: Appleton: MV trap, 25 June 2019.
12. *Hyphenodes species 1* (8420.1): WI Outagamie County: Appleton: MV trap, 20 June 2019.
13. *Hyphenodes species 1* (8420.1): WI Outagamie County: Appleton: MV trap, 27 July 2017.
14. *Hyphenodes species 1* (8420.1): WI Outagamie County: Appleton: MV trap, 1 July 2017.
15. *Hyphenodes franclemonti* (8424): WI Outagamie County: Fallen Timbers: open hydric hardwood forest, UV trap 9, 10 August 2019.
16. *Hyphenodes palustris* (8422): WI Outagamie County: Appleton: MV trap, 18 June 2017.
17. *Hyphenodes palustris* (8422): WI Outagamie County: Appleton: MV trap, 30 July 2019; Sequence Voucher Sample ID Number: 25003-COI-2020.
18. *Hyphenodes fractilinea* (8421): WI Dane County: Swamplovers Preserve: upland mesic hardwood forest/upland prairie restoration overlooking wet-mesic prairie planting/wetlands, MV trap, 19 August 2021.
19. *Hyphenodes fractilinea* (8421): WI Outagamie County: Appleton: MV trap, 6 July 2019.
20. *Hyphenodes species near fractilinea* (8421.1): WI Outagamie County: Appleton: MV trap, 11 August 2017.
21. *Hyphenodes species near fractilinea* (8421.1): WI Shawano County: Navarino Wildlife Area: boardwalk through bog adjacent to hardwood swamp and sedge meadow, UV sheet 14, 5 August 2022.
22. *Hyphenodes species near fractilinea* (8421.1): WI Outagamie County: Appleton: MV trap, 11.VIII. 2017.
23. *Hyphenodes species near fractilinea* (8421.1): WI Outagamie County: Appleton: MV trap, 12 July 2020; Sequence Voucher Sample ID Number: 25006-COI-2020.

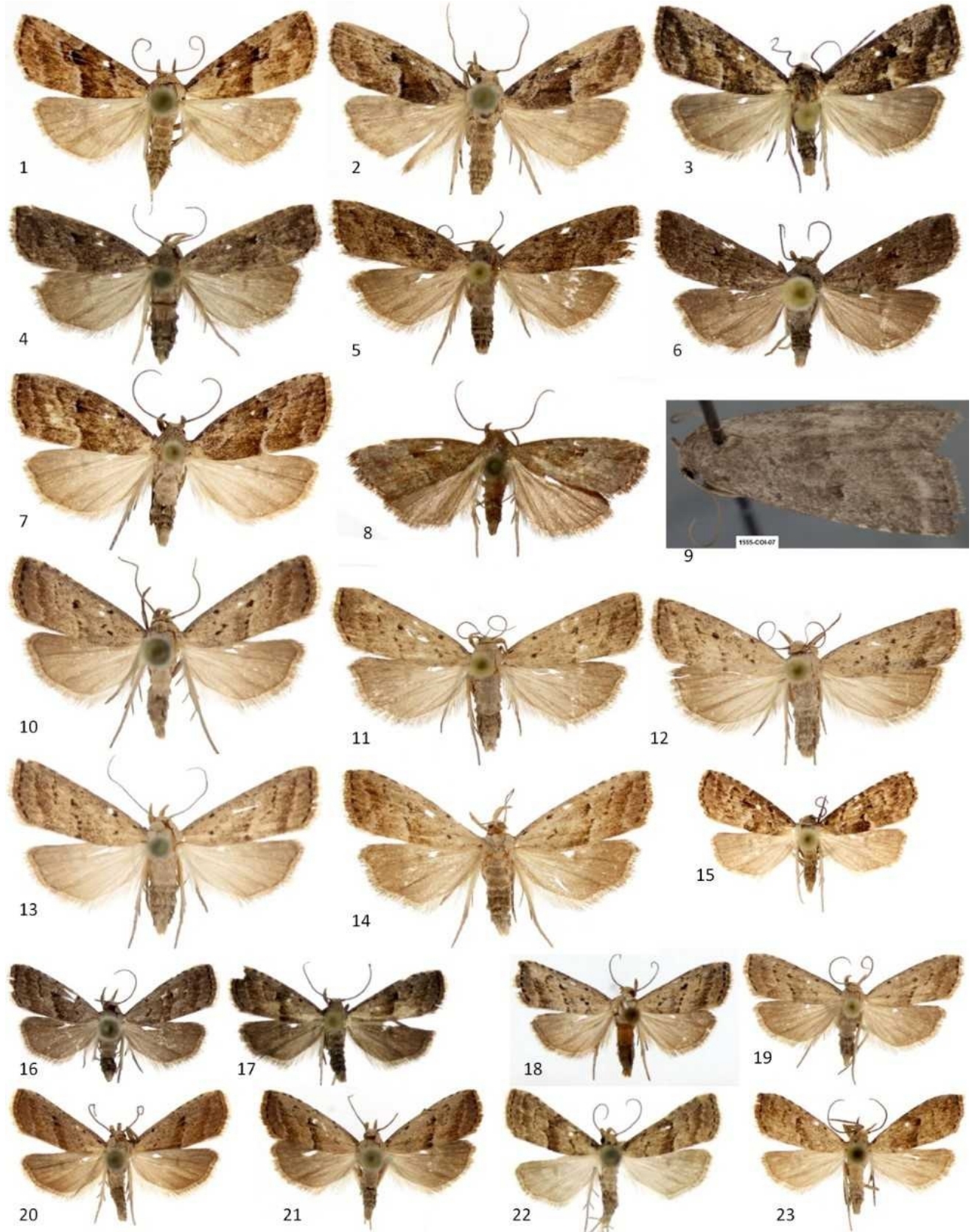


FIGURE 124: Pine Specialist *Zale* Species Recorded from Outagamie County and Adjacent Areas (part) (Noctuidae: Erebininae).

Two species match McDunnough's (1943) male genitalia drawings for both *Zale helata* and *Zale duplicata*. The species in each of these pairs are indistinguishable in male genitalia (including the three dimensional structure of the everted vesica), in contrast to most pine specialist *Zale* species, which have species specific genitalia. The second species with *duplicata*-like genitalia resembles *submediana* in size and pattern and is covered on the next plate.

Zale duplicata and *Zale helata* species 1 occur in habitats with white pine, red pine, or jack pine, including in areas where white pine or red pine are the only pines present. *Zale helata* species 2 occurs exclusively in jack pine habitats.

The two species with *helata*-like genitalia are readily separatable by pattern. Species 1 is predominately brownish whereas species 2 is blackish grey, and is actually more similar in pattern to some variants of *duplicata* than to *helata* species 1. *Zale duplicata* typically has distinct bluish grey scaling in contrast to the blackish appearance of *helata* species 2. *Zale duplicata* sometimes has brown scaling between the median band and postmedial line, and sometimes also in the basal area (Numbers 12-13), whereas this brown scaling is sparse or absent in *Zale helata* species 2. Some variants of *Zale duplicata* lack the typical amount of bluish grey scaling as well as the brown scaling, and these might only be reliably separated from *helata* species 2 by genitalia or DNA. Forbes' (1954) description of the pattern of *franclemonti* is in good agreement with *helata* species 2.

1. *Zale helata* species 1 (8704): WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 22 May 2020.
2. *Zale helata* species 1 (8704): I Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 11 May 2022.
3. *Zale helata* species 1 (8704): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 22 May 2020.
4. *Zale helata* species 1 (8704): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 31 May 2023.
5. *Zale helata* species 1 (8704): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 22 May 2020.
6. *Zale helata* species 1 (8704): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 22 May 2020.
7. *Zale helata* species 2 (8704.1): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest west of Highway K, south of Pike's Peak Flowage, bait trail 4, 11 May 2022.
8. *Zale helata* species 2 (8704.1): WI Marinette County: intermediate succession oak-jack pine barrens mosaic adjacent to the Dunbar Barrens, T 37N R 18E Sec 21, UV light, 4 June 1995. Dissection Number 2016HLK: 2390.
9. *Zale helata* species 2 (8704.1): WI Marinette County: intermediate succession oak-jack pine barrens mosaic adjacent to the Dunbar Barrens, T 37N R 18E Sec 21, UV light, 4 June 1995.
10. *Zale duplicata* (8703): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 22 May 2020.
11. *Zale duplicata* (8703): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 21 May 2020.
12. *Zale duplicata* (8703): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 22 May 2020.
13. *Zale duplicata* (8703): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest west of Highway K, south of Pike's Peak Flowage, bait trail 4, 11 May 2022.
14. *Zale duplicata* (8703): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 21 May 2020.
15. *Zale duplicata* (8703): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 21 May 2020.



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FIGURE 125: Pine Specialist *Zale* Species Recorded from Outagamie County and Adjacent Areas (part) (Noctuidae: Erebiniae).

These four species are similar in wing pattern and all can be differentiated by male and female genitalia, although the genitalia of *Zale* near *duplicata* are indistinguishable from *Z. duplicata*, which it does not resemble in pattern. The basal side of the median band is always basal to the reniform in *Z. near duplicata*, and never basal to the reniform in *Z. obliqua*. Either condition may occur in the other two species. *Zale metatoides* is smaller than the other three species. *Zale submediana* emerges first (between early April and early May, depending on how warm the spring is), and if the flight overlaps with the other species it is worn when they are fresh. *Zale* near *duplicata* emerges second, *Z. metatoides* third, and *Z. obliqua* last (typically late May). In fresh specimens, *Zale obliqua* has the most extensive reddish brown scaling in the median band, and usually has darker reddish brown scales in the reniform relative to the other species, which are orange.

1. *Zale submediana* (8702): WI Shawano County: Navarino Wildlife Area: oak-pine hardwood forest west of McDonald Road, south of Pike's Peak Flowage, bait trail, 11 May 2022.
2. *Zale submediana* (8702): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, east of McDonald Road, south of Pike's Peak Flowage, bait trail, 11 May 2022.
3. *Zale submediana* (8702): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, east of McDonald Road, south of Pike's Peak Flowage, bait trail, 11 May 2022.
4. *Zale submediana* (8702): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, east of McDonald Road, south of Pike's Peak Flowage, bait trail, 11 May 2022.
5. *Zale submediana* (8702): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, UV trap 8, 14 May 2022.
6. *Zale submediana* (8702): WI Shawano Co: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, east of McDonald Road, south of Pike's Peak Flowage, bait trail, 14 May 2022.
7. *Zale submediana* (8702): WI Shawano County: Navarino Wildlife Area: hardwood swamp by mesic hardwood/pine/hemlock forest, UV trap 13, 13 April 2023.
8. *Zale near duplicata* (8703.1): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, bait trail, 23 May 2023.
9. *Zale near duplicata* (8703.1): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 May 2023.
10. *Zale metatoides* (8707): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine hardwood forest, UV trap 11, 30 May 2022.
11. *Zale metatoides* (8707): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine hardwood forest, UV trap 11, 30 May 2022.
12. *Zale metatoides* (8707): WI Shawano County: Navarino Wildlife Area: sandy mesic to xeric oak-pine hardwood forest, UV trap 11, 30 May 2022.
13. *Zale metatoides* (8707): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, bait trail, 31 May 2023.
14. *Zale obliqua* (8699): WI Oconto County: Boulder Lake Campground: hardwood-conifer forest, bait trail, 5 June 2017.
15. *Zale obliqua* (8699): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 31 May 2023.



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FIGURE 126: *Catocala neogama* and *Catocala communis* (Noctuidae: Erebiniae).

Catocala neogama and *C. communis* are separate diagnosable phenotypes with different ranges and distributions within their range, thus I think they represent separate species. In Outagamie County, both species are regular at Mosquito Hill. However, only *C. neogama* is regular in suburban Appleton, with just a few records of *C. communis* despite a massive baiting effort over many years. The two species do not differ in genitalia and there is some overlap in COI 5' haplotypes, but this is true of most Juglandaceae specialist *Catocala* species.

Both species are sexually dimorphic and *C. neogama* is geographically variable. Males and females of *C. communis* have contrasting rich, light brown scaling between the postmedial and subterminal lines, whereas midwestern *C. neogama* have gray or dull grayish brown scaling. In males, the basal dash of *C. neogama* always reaches the antemedial line. In many *C. communis* males it is shorter (as in Number 3), and when it does reach the antemedial line (as in Number 1) it is usually thinner than in *C. neogama*. Also, *C. communis* males are bluish grey, whereas midwestern *C. neogama* are plain grey. Farther south in the Austral Zone, *C. neogama* may have more bluish and brown scaling than midwestern populations, but they still have distinctly less so than sympatric *C. communis*.

1. *Catocala communis* (8798.1) ♂: WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 25 July 2020.
 2. *Catocala communis* (8798.1) ♂: WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 24 July 2020.
 3. *Catocala neogama* (8798) ♂: WI Outagamie County: Appleton: bait trail, 8 August 2017.
 4. *Catocala neogama* (8798) ♂: WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 25 July 2020.
 5. *Catocala communis* (8798.1) ♀: WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 24 July 2020.
 6. *Catocala communis* (8798.1) ♀: WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 24 July 2020.
 7. *Catocala neogama* (8798) ♀: WI Outagamie County: Appleton: bait trail, 25 July 2017.
 8. *Catocala neogama* (8798) ♀: WI Outagamie County: Appleton: bait trail, 15 September 2017.
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FIGURE 127: *Catocala meskei* and *Catocala orion* (Noctuidae: Erebiniae).

The three dimensional structure of the everted vesica provides clear evidence that *C. meskei* and *C. orion* are separate species; this will be documented in a future taxonomic paper. However, wing pattern and flight season will usually enable reliable separation of these species. In Outagamie County I have not documented any overlap in the flights of *C. meskei* and *C. orion* during the same season, although there is some overlap in cumulative phenology data. If the two species were to fly together I expect *C. meskei* would be worn when *C. orion* is freshly emerged. The most consistent pattern difference is on the basal side of the hindwing medial band where it crosses vein M2 (black arrows). The band is fairly straight across vein M2 in *C. meskei* (it may be constricted) whereas it is distinctly angled in *C. orion*.

1. *Catocala meskei* (8822) ♂: WI Outagamie County: Appleton: bait trail, 30 July 2018.
2. *Catocala meskei* (8822) ♂: WI Outagamie County: Appleton: bait trail, 24 July 2017.
3. *Catocala orion* (8822.1) ♂: WI Outagamie County: Appleton: bait trail, 16 August 2018.
4. *Catocala orion* (8822.1) ♂: WI Outagamie County: Appleton: bait trail, 17 August 2018.
5. *Catocala meskei* (8822) ♀: WI Outagamie County: Appleton: bait trail, 23 July 2017.
6. *Catocala meskei* (8822) ♀: WI Outagamie County: Appleton: bait trail, 29 July 2017.
7. *Catocala orion* (8822.1) ♀: WI Outagamie County: Appleton: bait trail, 15 September 2017.
8. *Catocala orion* (8822.1) ♀: WI Outagamie County: Appleton: bait trail, 1 September 2017.
9. Cumulative Phenology Data For *Catocala meskei* and *Catocala orion* in Outagamie County.

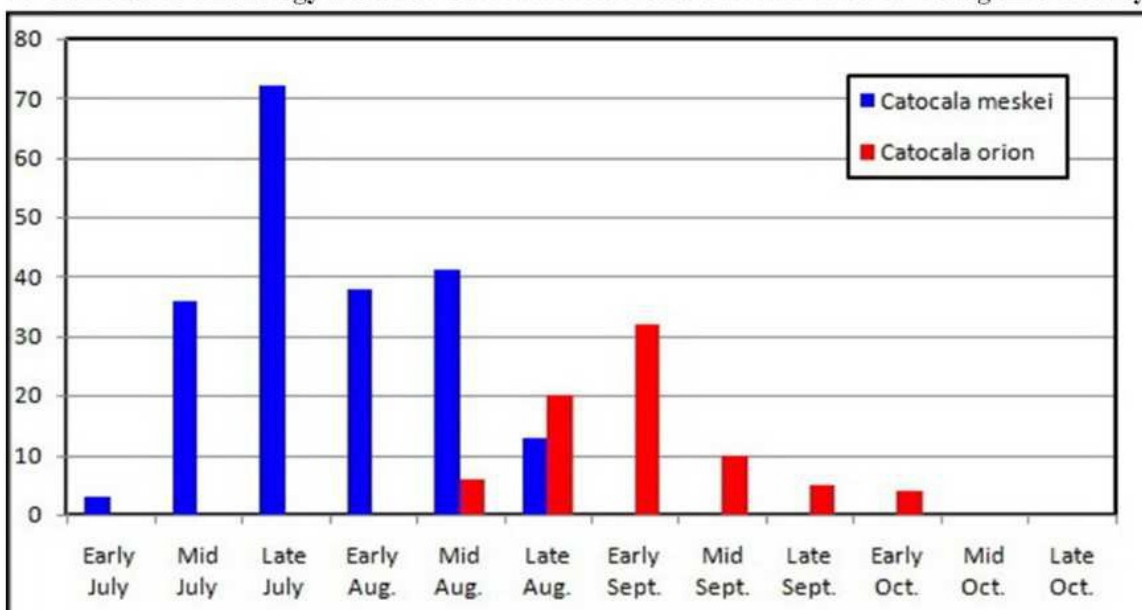




FIGURE 128: *Bellura* Species Recorded from eastern Wisconsin (Noctuidae: Noctuinae).

1. *Bellura obliqua* (9525) ♀: WI Shawano County: Navarino Wildlife Area: sedge meadow along stream, UV trap 23, 23 June 2023.
 2. *Bellura obliqua* (9525) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine upland clearing near hardwood forest/wetlands, UV sheet 17, 22 June 2022.
 3. *Bellura obliqua* (9525) ♂: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 23 June 2023.
 4. *Bellura brehmei* (9524) ♀: WI Shawano County: Navarino Wildlife Area: mesic hardwood/pine/hemlock forest, near hardwood swamp and open wetlands, UV trap 12, 31 May 2023.
 5. *Bellura brehmei* (9524) ♂: WI Shawano County: Navarino Wildlife Area: mesic hardwood/pine/hemlock forest, near hardwood swamp and open wetlands, UV trap 12, 31 May 2023.
 6. *Bellura densa complex species 1* (9526) ♂: WI Outagamie County: Appleton: MV trap, 16 August 2020. [41mm wing span, versus 27-31mm in *densa* phenotype 2]
 7. *Bellura species (anoa?)* (9525.1) ♂: WI Waukesha County: Ottawa Lake Fen: fen and sedge meadow along lake margin, UV trap, 9 August 1992.
 8. *Bellura species (anoa?)* (9525.1) ♂: WI Waukesha County: Ottawa Lake Fen: fen and sedge meadow along lake margin, UV trap, 9 August 1992.
 9. *Bellura densa complex phenotype 2* (9526.1) ♂: WI Shawano County: Navarino Wildlife Area: mesic hardwood/pine/hemlock forest, near hardwood swamp and open wetlands, UV trap 12, 31 May 2023.
 10. *Bellura densa complex phenotype 2* (9526.1) ♂: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 2 August 2022.
 11. *Bellura densa complex phenotype 2* (9526.1) ♀: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 2 August 2022.
 12. *Bellura densa complex phenotype 2* (9526.1) ♀: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 2 August 2022.
 13. *Bellura densa complex phenotype 2* (9526.1) ♀: WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements, UV trap 18, 2 August 2022.
 14. *Bellura gortynoides* (9523) ♀: WI Waukesha County: Ottawa Lake Fen: fen and sedge meadow along lake margin, UV trap, 9 August 1992.
 15. *Bellura gortynoides* (9523) ♀: IL DuPage County: prairie planting near ponds, MV Trap, 22 September 2023.
 16. *Bellura vulnifica* (9523.1) ♀: WI Outagamie County: Fallen Timbers: swamp forest edge/prairie planting, UV Trap 19, 16 July 2020.
 17. *Bellura vulnifica* (9523.1) ♀: WI Shawano County: Navarino Wildlife Area: oak-pine uplands south of low sedge meadow with bog elements, MV sheet 6, 26 July 2023.
 18. *Bellura vulnifica* (9523.1) ♀: WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 5 August 2023.
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FIGURE 129: The *Papaipema pterisii* species complex in the Outagamie County Area (Noctuidae: Noctuinae: *Papaipema*).

Papaipema pterisii phenotypes form two haplotype groups with COI 5' mtDNA sequences. On BOLDSystems (2022) they are called *pterisii* and "nr. *pterisii*." I have confirmed the presence of near *pterisii* in Outagamie County with two sequenced specimens (Numbers 3 & 6). See the species account on near *pterisii* for habitat differences in the Outagamie County area.

COI 5' mtDNA is the most reliable way to separate these species, followed by habitat. They would be difficult to separate without DNA if a site contained suitable habitat for both species. My series suggest near *pterisii* has more dark reddish orange scales than *pterisii* on average, at least in the coverage area, but there is overlap. I did not find differences in male genitalia.

1. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: sedge meadow opening in hydric hardwood forest with ostrich fern, UV trap 2, 6 September 2020.
 2. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: open hydric hardwood forest with ostrich fern, UV trap 21, 6 September 2020.
 3. *Papaipema near pterisii* (9480.1): WI Outagamie County: Appleton: MV trap, ostrich fern present in neighboring yard, 31 August 2020. DNA Sample ID Number: 25015-COI-2020.
 4. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: sedge meadow opening in hydric hardwood forest with ostrich fern, UV trap 2, 17 September 2018.
 5. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: open hydric hardwood forest with ostrich fern, UV trap 21, 5 September 2021.
 6. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: sedge meadow opening in hydric hardwood forest with ostrich fern, UV trap 2, 17 September 2018. DNA Sample ID Number: 25013-COI-2020.
 7. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fox River Walk by Riverside Cemetery: mesic to hydric hardwood forest along Fox River, UV trap, 13 September 2020.
 8. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: field with prairie planting/hydric hardwood forest edge, 18 September 2022.
 9. *Papaipema near pterisii* (9480.1): WI Outagamie County: Fallen Timbers: open hydric hardwood forest with ostrich fern, UV trap 21, 19 September 2021.
 10. *Papaipema pterisii* (9480): WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge with bracken fern, UV trap 18, 28 August 2022.
 11. *Papaipema pterisii* (9480): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, near xeric woodland with bracken fern, MV sheet, 28 August 2022.
 12. *Papaipema pterisii* (9480): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, near xeric woodland with bracken fern, MV sheet, 28 August 2022.
 13. *Papaipema pterisii* (9480): WI Portage County: Schmeeckle Reserve: bracken fern habitat, UV light, 21 September 1994.
 14. *Papaipema pterisii* ? (9480): WI Outagamie County: Appleton: lighted sheet, 1 September 1991. Note: At this time there was bracken fern growing in an adjacent yard, but since 2016 I have not seen this plant anywhere in the neighborhood.
 15. *Papaipema pterisii* (9480): WI Marinette County: oak-pine forest/barrens interface adjacent to the Dunbar Barrens, bracken grassland, T 37N R 18E Sec 21, UV trap, 28 August 1995.
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FIGURE 130: *Enargia* species in Outagamie County (part) (Noctuidae: Noctuinae).

Enargia mephisto and *Enargia infumata* have different distributions and phenologies, thus I think they represent separate species. I have found no overlap in the flight season in Wisconsin. In Outagamie County, *Enargia mephisto* flies primarily from mid June to early July, with worn specimens sometimes persisting until late July. *Enargia infumata* flies during August. *Enargia infumata* is most common in the Canadian Zone, and uncommon in the Outagamie County area and southeastern Wisconsin.

Most specimens of *Enargia mephisto* are plain brownish, as in Numbers 1-10. There is also an uncommon light tan form (Number 11). These forms are outside the range of variation found in *E. infumata*. However, there is an uncommon orange-brown form that does resemble *E. infumata* (Numbers 12-14) and probably cannot be reliably differentiated based on pattern. *Enargia infumata* has orange, orange-brown, orange-yellow, and orange-tan forms. Most phenotypes resemble *Enargia decolor* more closely than *Enargia mephisto*, but *Enargia decolor* lacks a black dot in the posterior corner of the reniform, which is usually present in *E. infumata* (and *E. mephisto*). The flight seasons of *E. infumata* and *E. decolor* may overlap in the latter part of August during some years, but *E. infumata* is usually worn when *E. decolor* is fresh.

1. *Enargia mephisto* (9551): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 June 2023.
 2. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest trail, UV trap 24, 19 June 2021.
 3. *Enargia mephisto* (9551): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet 8, 23 June 2023.
 4. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 5. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 6. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 7. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: open hydric hardwood forest, MV trap 21, 18 June 2021.
 8. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 9. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 10. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 11. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest trail, UV trap 24, 19 June 2021.
 12. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 13. *Enargia mephisto* (9551): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV trap 15, 23 June 2022.
 14. *Enargia mephisto* (9551): WI Outagamie County: Fallen Timbers: hydric hardwood forest edge/meadow with prairie planting, MV trap 20, 19 June 2021.
 15. *Enargia infumata* (9550): WI Forest County: Armstrong Creek Bog: UV trap, 14 August 1993.
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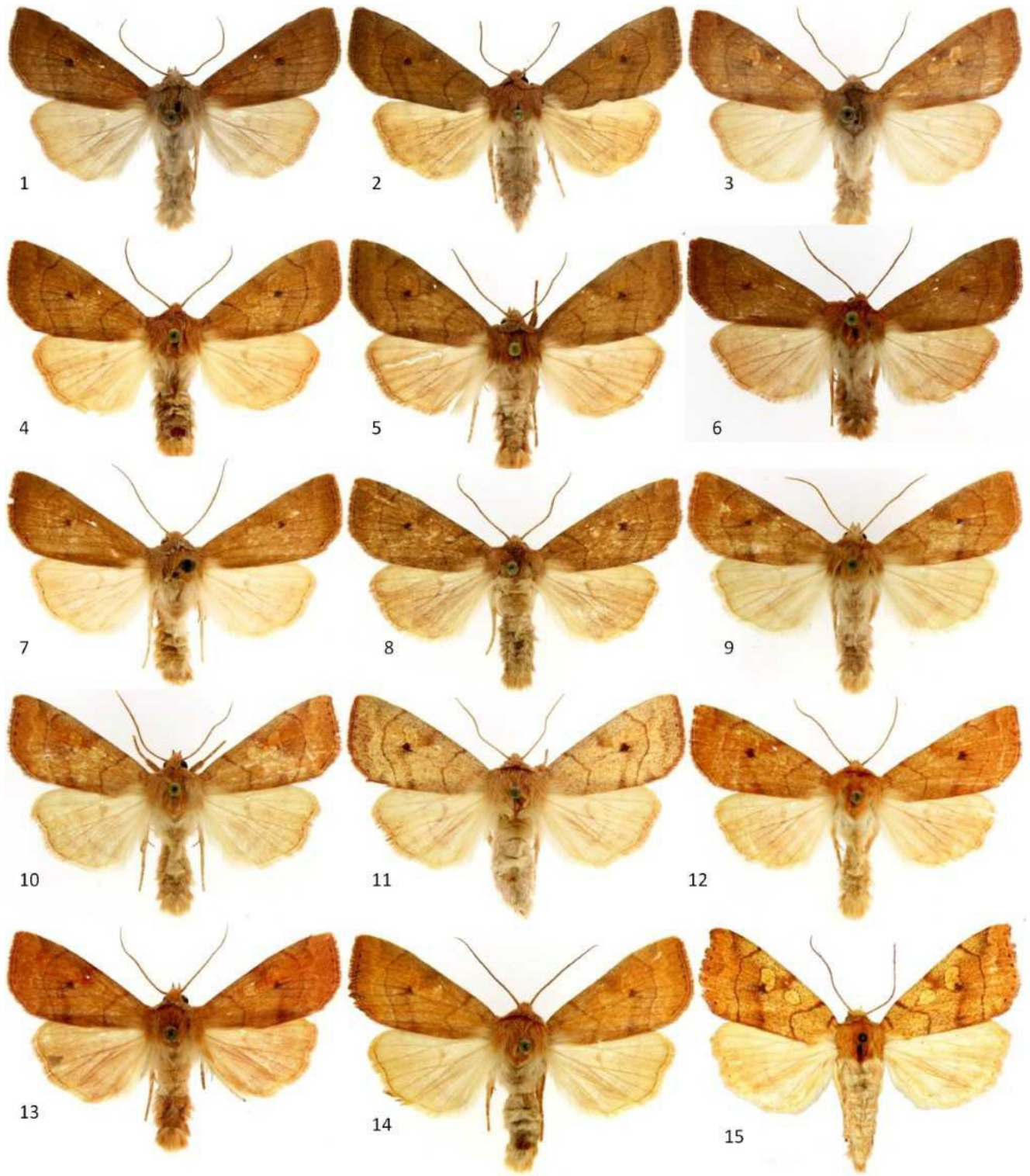
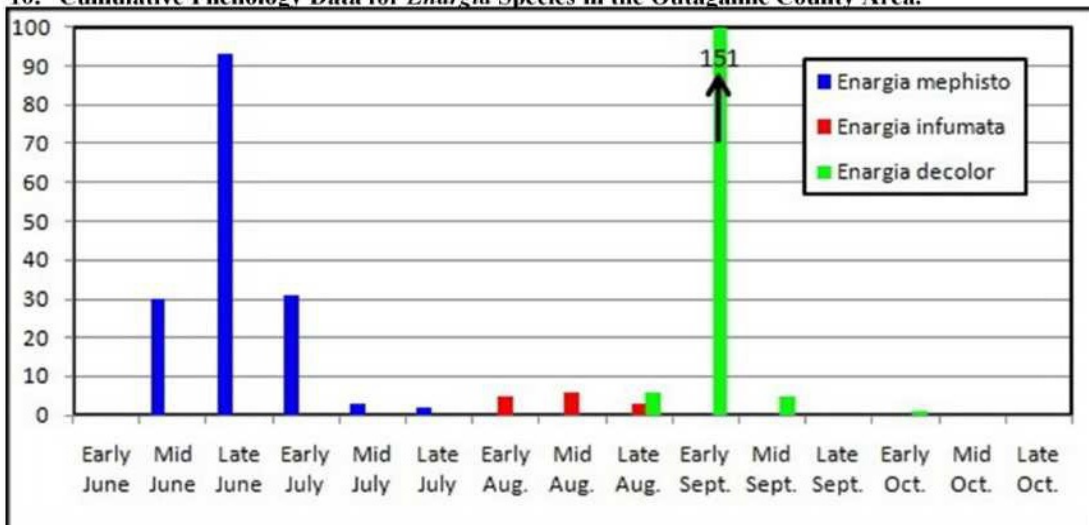


FIGURE 131: 1-10: *Enargia* species in the Outagamie County Area (part); 11-16 *Chytonix* Species in the Outagamie County Area (Noctuidae: Noctuinae).

1. *Enargia infumata* (9550): WI Outagamie County: Mosquito Hill: south side of hill along base, mesic hardwood forest, bait trail, 22 August 1994.
2. *Enargia infumata* (9550): WI Forest County: Armstrong Creek Bog: UV trap, 14 August 1993.
3. *Enargia infumata* (9550): WI Outagamie County: Appleton: UV lights, 20 August 1994.
4. *Enargia infumata* (9550): WI Forest County: Armstrong Creek Bog: UV trap, 14 August 1993.
5. *Enargia infumata* (9550): WI Outagamie County: Mosquito Hill: south side of hill along base, mesic hardwood forest, bait trail, 22 August 1994.
6. *Enargia infumata* (9550): WI Marinette County: oak-pine forest/barrens interface adjacent to the Dunbar Barrens, bracken grassland, T 37N R 18E Sec 21, UV sheet, 14 August 1993.
7. *Enargia decolor* (9549): WI Portage County: Schmeeckle Reserve: 25 September 1992.
8. *Enargia decolor* (9549): WI Portage County: Schmeeckle Reserve: 2 September 1993.
9. *Enargia decolor* (9549): WI Portage County: Schmeeckle Reserve: 9 September 1993.

10. Cumulative Phenology Data for *Enargia* Species in the Outagamie County Area.



Chytonix palliatricula has lighter grey (or white) between the antemedial and subterminal lines (anterior to vein Cu₂) relative to the other two species. *Chytonix sensilis* has rich contrasting brown between the postmedial and subterminal lines, and sometimes also in the basal and medial areas. These areas are dull grey in *C. rupertii*.

11. *Chytonix rupertii* (9558): WI Waukesha County: Ottawa Lake Campground: mesic hardwood forest/field, 13 July 1993, UV sheet.
12. *Chytonix rupertii* (9558): WI Waukesha County: Ottawa Lake Campground: mesic hardwood forest/field, 13 July 1993, UV sheet.
13. *Chytonix sensilis* (9557): WI Burnett County, Namekogan Barrens, oak-pine barrens, UV sheet, 5 August 1995.
14. *Chytonix sensilis* (9557): WI Burnett County, Namekogan Barrens, oak-pine barrens, UV sheet, 5 August 1995.
15. *Chytonix palliatricula* (9556): WI Outagamie County: Fallen Timbers: 2 July 1992.
16. *Chytonix palliatricula* (9556): WI Outagamie County: Appleton: MV trap, 11 July 2019.

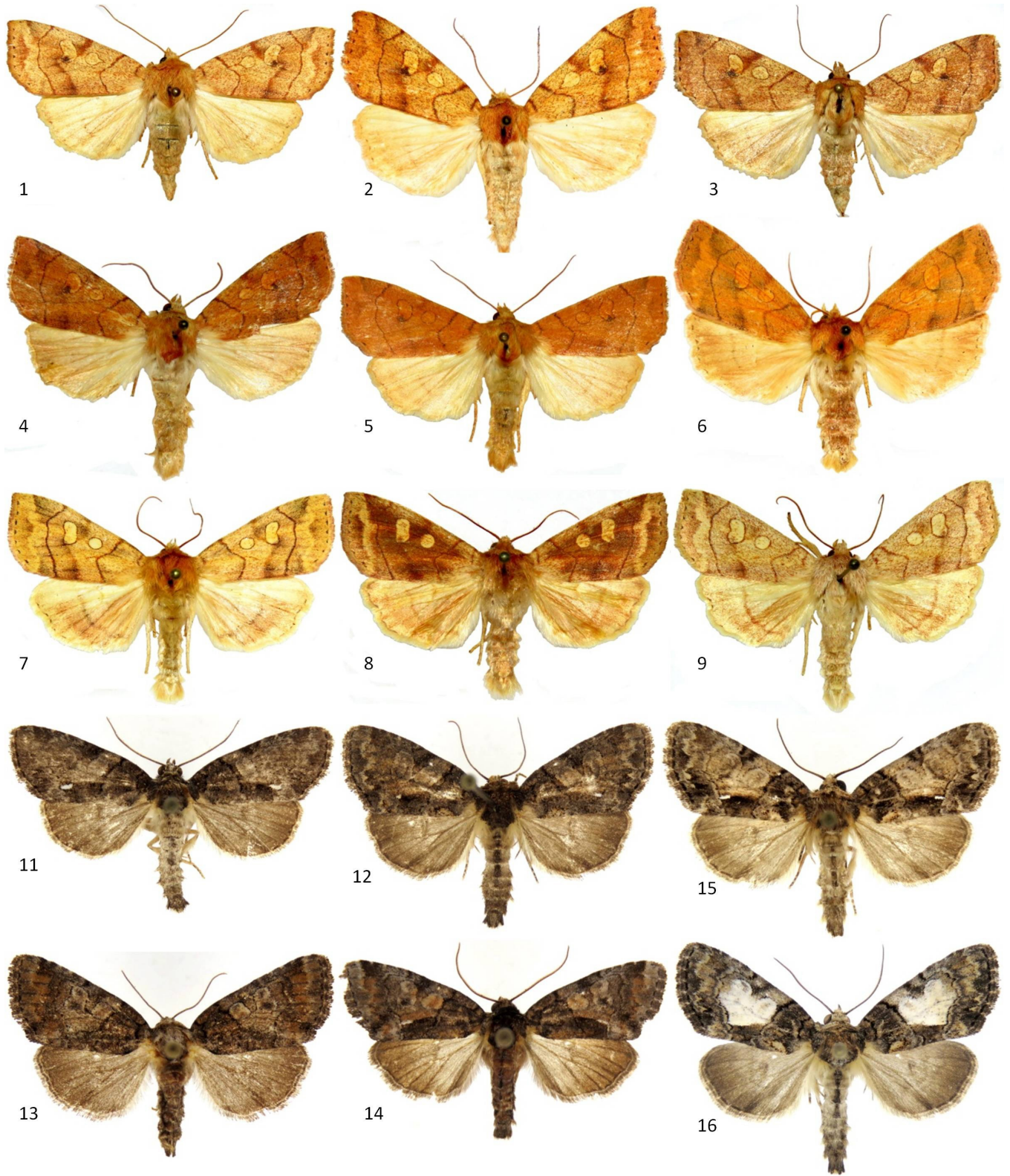


FIGURE 132: The *Lithophane disposita* species complex (Noctuidae: Noctuinae).

These two phenotypes are sympatric without intermediates at six localities in Outagamie, Shawano, and Portage Counties. However, they have different distributions, thus I think they are separate species. I have seen only the typical *disposita* phenotype from the Canadian Zone.

Lithophane near *disposita* is a lighter greenish grey relative to the darker grey or brownish grey of typical *disposita*. Near *disposita* also has more elongate wings. Near *disposita* usually has a thin black line between the antemedial and postmedial lines below the reniform/subreniform; in typical *disposita* this marking is a stouter black bar or absent. Numbers 7 & 12 as well as 8 & 13 were photographed together in the same frame.

1. *Lithophane* near *disposita* (9892.1): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 22 October 2022.
 2. *Lithophane* near *disposita* (9892.1): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 23 October 2022.
 3. *Lithophane* near *disposita* (9892.1): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 5 November 2020.
 4. *Lithophane* near *disposita* (9892.1): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, bait trail, 9 November 2020.
 5. *Lithophane* near *disposita* (9892.1): WI Outagamie County: Fallen Timbers: hydric hardwood forest/fields, bait trail, 11 April 2020.
 6. *Lithophane* near *disposita* (9892.1): WI Outagamie County: Old Stone Bridge Trail: mesic to hydric hardwood forest/fields, bait trail, 14 October 2020.
 7. *Lithophane* near *disposita* (9892.1): WI Shawano County: Navarino Wildlife Area: sandy oak-pine uplands with mixed grassland, shrubs, and woodland, bait trail, 2 November 2022.
 8. *Lithophane* near *disposita* (9892.1): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 24 October 2022.
 9. *Lithophane* near *disposita* (9892.1): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 23 October 2022.
 10. *Lithophane* near *disposita* (9892.1): WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, bait trail, 5 October 2022.
 11. *Lithophane* near *disposita* (9892.1): WI Outagamie County: Mosquito Hill: hilltop mesic hardwood forest/grassland, on twig, 9 November 2020.
 12. *Lithophane* *disposita* (9892): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 23 October 2022.
 13. *Lithophane* *disposita* (9892): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 23 October 2022.
 14. *Lithophane* *disposita* (9892): WI Outagamie County: Fallen Timbers: hydric hardwood forest/fields, bait trail, 20 September 2021.
 15. *Lithophane* *disposita* (9892): WI Outagamie County: Fallen Timbers: hydric hardwood forest/fields, bait trail, 20 September 2021.
 16. *Lithophane* *disposita* (9892): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest mixed with grassland, bait trail 1, 23 October 2022.
 17. *Lithophane* *disposita* (9892): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, bait trail, 8 November 2020.
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FIGURE 133: The *Lithophane baileyi* and *Lithophane hemina* species complexes (Noctuidae: Noctuinae).

BOLDSys (2022) public COI 5' sequences for what is currently considered *Lithophane baileyi* form two haplotype groups. One group includes the plain dark grey *baileyi* phenotype, whereas the other group includes the silvery *vivida* phenotypes from the Pacific northwest as well as variable phenotypes that occur in the eastern U.S. Two sympatric phenotypes occur in the Canadian and Northern Transition Zones of eastern Wisconsin that appear to correspond to both haplotype groups, although no Wisconsin material has been sequenced. Midwestern and Appalachian material of the variable phenotype differs in pattern from *vivida* of the Pacific northwest; I do not know if intermediate populations occur somewhere inbetween, and refer to this material as "*vivida* or species near."

In eastern Wisconsin, *vivida* or species near differs from *baileyi* by having a lighter silvery to bluish grey forewing coloration, and a more strongly contrasting dark band between the reniform and subreniform, extending posteriorly along the basal side of the postmedial line. Fresh specimens might also have more of a pinkish cast to the hindwing.

Note: Numbers 1 and 6 were photographed together in the same frame.

1 & 5. *Lithophane vivida* or species near (9903): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest/grassland east of Highway K, bait trail, 22 October 2022.

2 & 4. *Lithophane vivida* or species near (9903): WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, bait trail, 24 October 2022.

3. *Lithophane vivida* or species near (9903): WI Portage County: Schmeckle Reserve: west of divided highway, sedge meadow surrounded by oak-pine-hardwood forest, near oak-pine barrens opening, UV trap, 18 September 1995.

6. *Lithophane baileyi* (9902): WI Shawano Co: Navarino Wildlife Area: oak-pine uplands south of sedge meadow with bog elements, 10 November 2022.

7. *Lithophane baileyi* (9902): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 9 March 2021.

8. *Lithophane baileyi* (9902): WI Shawano Co: Navarino Wildlife Area: oak-pine uplands south of sedge meadow with bog elements, 10 April 2022.

9. *Lithophane baileyi* (9902): WI Shawano Co: Navarino Wildlife Area: oak-pine uplands south of sedge meadow with bog elements, 10 April 2022.

10. *Lithophane baileyi* (9902): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 16 March 2022.

11. *Lithophane baileyi* (9902): WI Outagamie County: Fallen Timbers: hydric hardwood forest, bait trail, 9 March 2021.

12. *Lithophane lanei* (9893.1): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, MV trap 17, 13 March 2021.

13. *Lithophane lanei* (9893.1): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 22 March 2021.

14. *Lithophane hemina* (9893): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 23 March 2021.

15. *Lithophane hemina* (9893): WI Outagamie County: Fallen Timbers: white cedar/hardwood swamp, bait trail, 9 March 2021.

16. *Lithophane petulca* (9889): WI Outagamie County: Mosquito Hill: hilltop/hillside mesic hardwood forest/grassland, 9 November 2020.

17. *Lithophane petulca* (9889): WI Shawano County: Navarino Wildlife Area: xeric-mesic-hydric oak-pine-hardwood forest/grassland east of Highway K, bait trail, 23 October 2022.

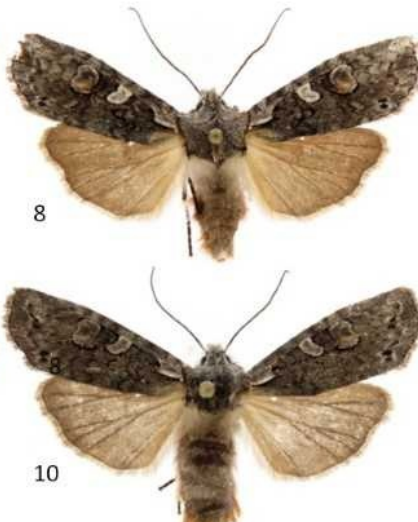
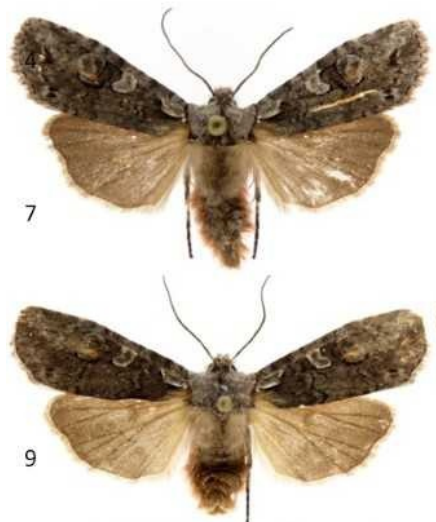
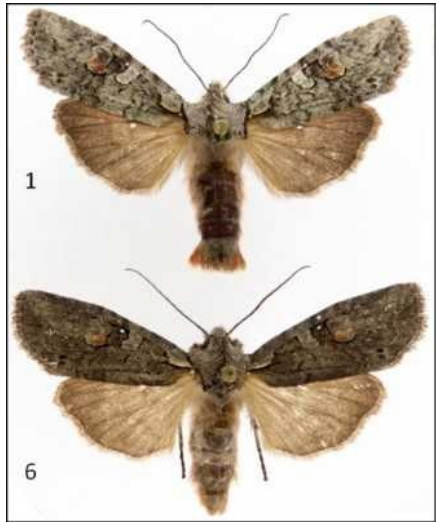


FIGURE 134: Species Complexes in the Outagamie County Area (Notodontidae & Noctuidae).

***Clostera inclusa* complex:** I have seen the "near *inclusa*" phenotype only from extensive Canadian Zone oak-pine barrens, including the vicinity of the Dunbar Barrens in Marinette County and the Moquah Barrens in Bayfield County. It is univoltine and flies during late May and June. It is larger and paler than typical *inclusa*. See also the *inclusa* species account.

1. ***Clostera near inclusa* (7896.1):** WI Marinette County: oak-pine forest/barrens interface adjacent to the Dunbar Barrens, T 37N R 18E Sec 21, UV light, 20 May 1995.
2. ***Clostera near inclusa* (7896.1):** WI Marinette County: intermediate succession oak-jack pine barrens mosaic adjacent to the Dunbar Barrens, T 37N R 18E Sec 21, UV light, 4 June 1995.
3. ***Clostera inclusa* complex (7896):** WI Outagamie County: Mosquito Hill: south side of hill/upland prairie planting, UV trap 6, 3 June 2020.

***Papaipema birdi* complex:** Two diagnosable phenotypes occur in the coverage area. Most are the phenotype in Numbers 4-5, which matches the *birdi* type. Phenotype 2 differs from the nominotypical phenotype by having the area between the antemedial and postmedial lines with predominately brown rather than orange scales.

4. ***Papaipema birdi* (9486) ♀:** WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, UV sheet 10, 1 September 2022.
5. ***Papaipema birdi* (9486) ♀:** WI Outagamie County: Fallen Timbers: Swamp Road Trail, sedge area in hydric hardwood forest, UV trap, 16 August 1994.
6. ***Papaipema birdi* phenotype 2 (9486) ♂:** WI Portage County: Schmeekle Reserve, sedge meadow, UV trap, 5 October 1992.
7. ***Papaipema birdi* phenotype 2 (9486) ♀:** WI Outagamie County: Mosquito Hill: building lights, 16 September 2021.

***Papaipema nelita* complex:** Species 2 has a smoother, glossier appearance, a narrower reniform, and a richer, more contrasting forewing coloration relative to species 1. Species 1 also has an earlier flight.

8. ***Papaipema nelita* species 1 (9502) ♂:** WI Outagamie County: Mosquito Hill: prairie planting/floodplain forest edge, MV sheet 10, 23 August 2022.
9. ***Papaipema nelita* species 2 (9502) ♂:** WI Waukesha County: Kettle Moraine Fen & Low Prairie State Natural Area: wet prairie/sedge meadow, UV sheet, 23 September 1994.

***Acrionicta impleta* complex:** Species 1 is univoltine with a light grey hindwing. Species 2 is multivoltine with a brownish hindwing.

10. ***Acrionicta impleta* species 1 (9257):** WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 22 May 2020.
11. ***Acrionicta impleta* species 2 (9257.1):** WI Outagamie County: Appleton: lighted sheet, 18 August 1991.

***Xestia dilucida/youngii*:** These two phenotypes are sympatric without intermediates in the Canadian and Northern Transition Zones of eastern Wisconsin, including at the Navarino Wildlife Area. However, I have found only *dilucida* in the Southern Transition Zone, including at Mosquito Hill, Fallen Timbers, and the Southern Kettle Moraine (Waukesha County).

12. ***Xestia dilucida* (10969) ♀:** WI Shawano County: Navarino Wildlife Area: sandy oak-pine barrens, MV sheet, 28 August 2022.
13. ***Xestia dilucida* (10969) ♂:** WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 28 August 2022.
14. ***Xestia youngii* (10970) ♀:** WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 28 August 2022.
15. ***Xestia youngii* (10970) ♂:** WI Shawano County: Navarino Wildlife Area: sedge meadow with bog elements/oak-pine forest edge, UV trap 18, 28 August 2022.

***Properigea costa* complex:** Number 16 is typical of phenotypes from southwestern Oklahoma and Missouri. The Grant County specimen is a phenotype I have not seen from the south central states, with the reddish orange replaced by brownish black, and much more extensive whitish scaling.

16. ***Properigea costa* (9589):** WI Outagamie County: Mosquito Hill: hill top mesic hardwood forest/grassland, MV trap 4, 10 July 2020.
17. ***Properigea costa* phenotype 2 (9589):** WI Grant Co.: Nelson Dewey State Park: 3 July 1992, Robert J. Borth.

***Discestra trifolii* complex:** Species 2 has a lighter forewing background color with a more contrasting reniform, claviform, and subterminal area. Species 1 is widespread in eastern North America except in the Gulf Region, whereas species 2 appears to be confined to the Canadian Zone. See also page 34.

18. ***Discestra trifolii* species 1:** WI Outagamie County: Mosquito Hill: prairie planting: MV trap 24, 24 August 2023.
19. ***Discestra trifolii* species 2:** WI Ashland County: Long Island Sand Dunes, UV trap, 18 August 1995, L. A. Ferge.



Southern Lepidoptera strays recently recorded from Outagamie County, WI



1. *Melipotis fasciolaris* (8599): Suburban Appleton: MV Trap, 20 September 2019. 2. *Schinia gaurae* (11168): Mosquito Hill: upland prairie planting/forest edge, MV sheet, 9 June 2023. 3. *Melipotis perpendicularis* (8598): Suburban Appleton, MV Trap, 29 July 2020. 4. *Enigmogramma basigera* (8886): Suburban Appleton: MV Trap, 30 September 2019. 5. *Argyrogramma verruca* (8885): Suburban Appleton: MV Trap: 17 August 2017. 6. *Condica confederata* (9714): Suburban Appleton: MV Trap, 21 October 2017. 7. *Heliothis virescens* (11071): Suburban Appleton: MV Trap, 3 October 2023. 8. *Mouralia tinctoides* (8884): Suburban Appleton: MV Trap, 21 October 2017. 9. *Spodoptera exigua* (9665): Suburban Appleton: MV Trap, 28 June 2012. 10. *Disclisoprocta stellata* (7417): Suburban Appleton: netted shortly after dark, 19 September 2022. 11. *Iridopsis defectaria* (6586): Suburban Appleton: UV Trap, 27 August 2021. 12. *Macaria promiscuata* (6331): Suburban Appleton: MV Trap, 3 September 2017.