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**MOTHS OF THE DOUGLAS LAKE REGION (EMMET
AND CHEBOYGAN COUNTIES), MICHIGAN:
I. SPHINGIDAE-CTENUCHIDAE (LEPIDOPTERA)¹**

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For more than 60 years, workers at the University of Michigan Biological Station have been concerned with the flora and fauna of the "Douglas Lake Region" – now generally defined, for ease of boundaries, as Emmet and Cheboygan counties, which share the northern tip of the Lower Peninsula of Michigan.

In 1915, Paul S. Welch published a list of Lepidoptera taken in the immediate vicinity of Douglas Lake, based on collections made from 1911 to 1913. The list includes 16 species in the families here considered (those before the Noctuidae in most checklists). A somewhat larger number of species, 55, were attributed to one (usually Cheboygan) or both of these counties in Moore's list of the moths of Michigan (1955) – a few of them credited solely on the basis of Welch's list. I am now able to list 73 species in these families, all represented by extant specimens, and it seems well to assemble the information into compact form, as has been done for the butterflies (Voss, 1954, supplemented by Voss & Wagner, 1956). Additional species will certainly turn up in future years, in the field or in unexamined collections.

The list which follows is based chiefly on my own collection (kept at Mackinaw City, Michigan), which consists largely of Emmet County material collected from 1944 to 1949, with a larger percentage of Cheboygan County material from 1950 onwards – although there have been several years in which I have been unable to devote time to insect collecting. Except when only data to the contrary are cited, all species listed are represented in my collection from the region considered. The collection of the University of Michigan Biological Station (UMBS), at Douglas Lake, has provided a number of good records. I have also examined the collections in the Museum of Zoology of The University of Michigan (UMMZ) and the Department of Entomology, Michigan State University (MSU); both of these, particularly the former, have added information. I am grateful to the late Dr. H. B. Hungerford for the opportunity to examine in detail the Biological Station collection in 1950 and to Dr. R. E. Beer for recent use of that collection and for the opportunity to examine a number of the collections made by his students, and to the several curators and correspondents who have aided with additional data, especially Julian P. Donahue, M. C. Nielsen, and John H. Newman.

In this listing, the nomenclature and sequence of species are based on several standard authorities. The Sphingidae follow McDunnough (1938); the Saturniidae (including Citheroniidae) follow the classification of Michener (1952); the Arctiidae and related small families follow Forbes (1960) except for *Holomelina*, which follows Cardé (1965). A few synonyms from these publications are given in brackets. Species for which I have recorded authentic Emmet or Cheboygan county records are numbered in sequence, followed by listing of the county or counties and inclusive dates for earliest and latest records in the two-county region. A few additional records from northern Michigan counties have been added when they seem worthy of note.

The vast majority of captures have been made at light. Most of the Emmet County records were taken at incandescent light at Mackinaw City, and most of the Cheboygan County captures were made at the Biological Station (carbon arc light through 1961; mercury vapor light from 1962 to date). Too little work has been done on rearing, and a few attempts at "sugaring" have been singularly unproductive.

¹Contribution from the Biological Station of The University of Michigan.

SPHINGIDAE

1. *Phlegethontius quinquemaculata* Haw. Cheboygan: June 9 - July 25. Not at all common in this region.
2. *Ceratonia amyntor* Hbn. Cheboygan: June 16 -August 3.
3. *Ceratonia undulosa* Wlk. Emmet, Cheboygan: June 12 - August 8.
4. *Sphinx chersis* Hbn. Emmet, Cheboygan: June 16 - July 30.
5. *Sphinx canadensis* Bdv. Cheboygan: June 16 - August 6.
6. *Sphinx kalmiae* J.E. Smith. Emmet, Cheboygan: June 28 - August 14. This species and *S. chersis* are the only ones in the genus which can usually be counted upon to appear each year, although they can hardly be described as common. The other species of *Sphinx* are quite uncommon.
7. *Sphinx gordius* Cram. Cheboygan: June 30 - July 16. M.C. Nielsen informs me that he found a nearly full-grown larva of this species on sweet gale (*Myrica gale*) at Duncan Bay, Cheboygan County, July 31, and that he has taken adults as early as June 12 in this county.
8. *Sphinx luscitiosa* Clem. Emmet, Cheboygan: June 21 - 30.
9. *Sphinx drupiferarum* J.E. Smith. Cheboygan: July 2 - 15.
10. *Lapara bombycoides* Wlk. Emmet, Cheboygan: June 16 - August 8. A common moth at light at the Biological Station.
11. *Smerinthus jamaicensis* f. norm. *geminatus* Say [*S. geminatus*], Emmet, Cheboygan: June 14 - August 20.
12. *Smerinthus cerisyi* Kby. Emmet, Cheboygan: May 14 - August 7. Not at all rare in this region.
13. *Paonias excaecatus* J.E. Smith. Emmet, Cheboygan: June 12 - August 9. Often rather frequent.
14. *Paonias myops* J.E. Smith. Emmet, Cheboygan: June 16 - July 22.
15. *Cressonia juglandis* J.E. Smith. Cheboygan: June 21 - July 7. The usual larval food plants, walnut and hickory, are not native this far north in Michigan, but do occur sparsely as planted trees in farmyards — although there are none in the immediate vicinity of the Biological Station. Either our few specimens have flown several miles or the larvae fed on something else.
16. *Pachysphinx modesta* Harr. Emmet, Cheboygan: June 16 - August 14. Our commonest sphingid; the larvae presumably feed on the bigtooth aspen (*Populus grandidentata*) which is so abundant in the area.
17. *Hemaris thysbe* Fabr. [*Haemorrhagia thysbe*], Cheboygan: June 9 - 30; August 4 - 6. I have only two specimens, one taken August 4, 1951, at flowers of swamp thistle (*Cirsium muticum*) and the other taken August 6, 1950, at flowers of wild bergamot (*Monarda fistulosa*). The June dates are reported by Nielsen and presumably represent an earlier brood.

18. *Hemaris diffinis* Bdv. [*Hemorrhagia diffinis*]. Emmet, Cheboygan: June 9 - July 29. I have taken specimens at flowers of lilac (*Syringa vulgaris*), bush honeysuckle (*Diervilla lonicera*), Canada violet (*Viola canadensis*), and common milkweed (*Asclepias syriaca*). The rather similar *H. gracilis* G. & R. has been taken by Nielsen in Roscommon, Chippewa, and Mackinac counties, and is to be expected in the Douglas Lake region. Nielsen's records include visits to flowers of dandelion (*Taraxacum* sp.), orange hawkweed (*Hieracium aurantiacum*), and purple vetch (*Vicia* sp.).
19. *Pholus achemon* Dru. Cheboygan: July 23 - August 1. The only specimens are in the UMBS collection.
20. *Ampeloeca myron* Cram. [*Darapsa myron*]. Cheboygan: June 29 - July 25. One specimen in the UMBS collection has pollinia of milkweed (*Asclepias* sp.) on its legs.
21. *Darapsa pholus* Cram. [*D. choerilis*]. Emmet, Cheboygan: June 16 - July 31. A rather common moth.
22. *Amphion nessus* Cram. Cheboygan: June 25 - 30. Diurnal; my two specimens were collected on the Biological Station campus by P.S. Welch and H.B. Hungerford in 1950. A third specimen, taken by Hungerford in 1946, is in the UMBS collection. Apparently uncommon.
23. *Celerio gallii intermedia* Kby. Cheboygan: July 1 - 14. The only specimens are in the UMBS and student collections. Except for the first week of July, 1967, apparently a rare moth in the region.
24. *Celerio lineata* Fabr. Emmet, Cheboygan: June 24 - September 11. In my experience, a very rare species in this area. My only specimen is from a larva found on *Oenothera* (evening-primrose) at Cecil Bay, Emmet County, by H.H. Bartlett on July 27, 1948. It was reared on apple leaves and pupated underground on August 18. The adult emerged September 7, and is unusually small (53 mm). Nielsen has found the species in Cheboygan County.

SATURNIIDAE (including CITHERONIIDAE)

25. *Eacles imperialis pini* Mich. Cheboygan: June 16 - July 30. Nielsen has taken this moth as late as August 8 in this county. A rather common insect at the Biological Station, which is the type locality for the subspecies (holotype♂, AMNH, August 4, 1947). According to Michener (1950), larvae of this subspecies feed exclusively on pine (white pine, *Pinus strobus* and jack pine, *P. banksiana*), McGugan (1958) also reports red pine (*P. resinosa*) and Scots pine (*P. sylvestris*), as well as white spruce (*Picea glauca*), as hosts.
26. *Anisota rubicunda* Fabr. Cheboygan: June 16 - July 12. Not nearly so common here as farther south in the state. One of my specimens (June 30, 1968) lacks pink on the wings except for a very small faint flush at the base of the forewings.
27. *Anisota virginiensis* Dru. Cheboygan: June 26. A single specimen, in the UMBS collection, was taken in 1948 by C.O. Berg.
- *Hemileuca lucina* H. Edw. Although not yet found in the Lower Peninsula, this species might be expected. I have a single perfect male, apparently freshly emerged, taken about 3:00 p.m. August 15, 1964, by C.W. Laskowski on foliage of red pine at the Seney National Wildlife Refuge, Schoolcraft County. Although not previously reported for the state, this species is in the UMMZ from Schoolcraft County, the badly worn specimens presumably those reported from that county as *H. maia* by Moore (1955).
28. *Automeris io* Fabr. Cheboygan: June 16 - July 30. Males far outnumber females.

29. *Antheraea polyphemus* Cram. [*Telea polyphemus*]. Emmet, Cheboygan: June 23 - July 23.

30. *Actias luna* L. [*Tropaea luna*]. Emmet, Cheboygan: May 24 - July 19. A female collected at Mackinaw City, Emmet County, June 11, 1946, laid 24 eggs; larvae emerged June 24 and were reared on paper birch (*Betula papyrifera*). Moults occurred June 24, 28; July 3 - 4, 10, 19. Cocoons were made July 29 - August 5.

31. *Hyalophora cecropia* L. [*Samia cecropia*; *Platysamia cecropia*]. Emmet, Cheboygan: June 11 - July 1. An uncommon moth in this region, and largely unnoticed as it flies chiefly before the regular session of the Biological Station opens. Many years ago I reared a number of larvae found on chokecherry (*Prunus virginiana*). *H. columbia* Sm. is to be expected in the region.

32. *Hyalophora promethea* Dru. [*Callosamia promethea*]. Cheboygan: June 19 - July 11. There is a single female in the UMBS collection, June 19, 1945 (Ethel Ludovic). In my copy of Welch's 1915 list I have inserted this species with the pencilled note: "vii-11-1927 - Chev. Co. D.L. [Douglas Lake], P.S.W." My memory fails me completely as to the source of these data, which presumably were supplied me about 1950 by P.S. Welch, although they may represent a specimen seen once in the Station collection and subsequently vanished. The moth is obviously very rare in this region, as would be expected from the absence of the commonest larval foodplants (sassafras, *Sassafras albidum*, and spicebush, *Lindera benzoin*) this far north in the state. However, at the northern edge of its range in Ontario, the species has been reported (McGugan, 1958) on black cherry, pin cherry, green ash, and white ash, all of which occur in the Douglas Lake region.

AGARISTIDAE

33. *Alypia langtoni* Couper. Emmet: July 9. One female, taken in 1955 by F.H. Rindge (in company of A.B. Klots and E.G. Voss) and in the collection of the American Museum of Natural History. An additional specimen, presumably of the same species, was seen; the locality was near the Maple River six miles west of Pellston.

34. *Alypia octomaculata* Fabr. Cheboygan: August 7. One female, in the UMBS collection, taken in 1947 by Frances E. Bull.

ARCTIIDAE

35. *Cycnia tenera* Hbn. Emmet, Cheboygan: June 14 - July 29.

36. *Euchaetias egle* Dru. Emmet, Cheboygan: July 5 - 20.

37. *Euchaetias oregonensis* Stretch. Emmet, Cheboygan: June 18 - August 6.

38. *Halysidota caryae* Harr. Cheboygan: June 30. One specimen, in the UMBS collection, was taken in 1956 by K.C. Shaw. McGugan (1958) reports 17 hosts in Ontario, most of which grow in this region even though hickories (*Carya* spp.) are only occasional planted trees this far north.

39. *Halysidota maculata* Harr. Emmet, Cheboygan: June 19 - July 27.

40. *Halysidota tessellaris* J.E. Smith. Emmet, Cheboygan: June 27 - July 28.

41. *Holomelina laeta* Guer. [*Eubaphe laeta*]. Emmet, Cheboygan: June 23 - August 10.

42. *Holomelina aurantiaca* Hbn. [*Eubaphe aurantiaca*]. Emmet, Cheboygan: July 22 - August 18. (See note after next species.)

43. *Holomelina ferruginosa* Wlk. [*Eubaphe ferruginosa*]. Emmet, Cheboygan: July 2 - 26. Although treated by Forbes (1960) as merely a larger and less marked variety (*immaculata* Reak.) of the preceding species, I here follow McDunnough and Cardé in recognizing this as distinct. All of my specimens are males and resemble Cardé's figures of male *ferruginosa* however, they run a bit larger: length of forewing 13.5 - 14.5 mm, expanse ca. 27.5 - 29.0 mm. My male *aurantiaca* run 10.5 - 11.5 mm in forewing length, ca. 20 - 23 mm in expanse; two females run 13 mm in length of forewing, 26 mm in expanse. These measurements, too, are a little longer than given by Cardé, but are rather in accord with Forbes. *H. ferruginosa* is frequent at light and apparently flies somewhat earlier than *aurantiaca*.

44. *Holomelina lamae* Freem. [*Eubaphe lamae*]. Cheboygan: July 15. I am referring here a single female taken in 1950 ca. 10:00 a.m. in Mud Lake Bog, Inverness Tp. It resembles Cardé's figure of ♀ *lamae*, but as with our other species it is a bit larger. The forewing is 11.5 mm, the expanse 24mm. It appears much like fig. 7 of Ferguson (1953). The bog habitat, slightly smaller size (compared with *aurantiaca*), and yellow-orange ground color of the hindwings all suggest *lamae*.

Holomelina opella nigricans Reak. Not yet found as far north in Michigan as the Douglas Lake region. The Oceana County listing in Moore (1955) is presumably based on my specimen taken July 20, 1944, near the west end of Stony Lake.

45. *Pyrrharctia isabella* J.E. Smith [*Isia isabella*]. Emmet, Cheboygan: June 20 - July 21.

46. *Phragmatobia fuliginosa rubricosa* Harr. Cheboygan: July 17 - August 29. Apparently not at all common in the region.

47. *Phragmatobia assimilans* Wlk. Emmet, Cheboygan: May 15 - June 5. These records are cited in full by Donahue and Newman (1966); I have not taken the species myself.

48. *Spilosoma latipennis* Stretch [*Diacrisia latipennis*]. Cheboygan: July 8. A single specimen, in UMMZ, taken at light at Burt Lake in 1940 by Max Peet. Quite possibly overlooked in the field because of resemblance to the next species, which is more frequent. In *S. latipennis* the conspicuous hairs on the coxae of the forelegs are pink, while in the other three species they are yellow-orange.

49. *Spilosoma virginica* Fabr. [*Diacrisia virginica*]. Emmet, Cheboygan: June 24 - July 24. The frenulum-hook is dark-scaled in this species.

50. *Spilosoma congrua* Wlk. [*Estigmene congrua*]. Emmet, Cheboygan: June 12 - July 2. My only specimen, a male, was taken June 12, 1946, at light at Mackinaw City. Max Peet took a female June 24, 1936, and a male July 2, 1937, both at light at Burt Lake and now in UMMZ. Differs from the preceding species in the white frenulum-hook, in having the hairs of the abdomen entirely white, with no yellow or black, and often in having a pattern of small dark spots on the forewings above.

51. *Spilosoma prima* Sloss. [*Estigmene prima*]. Cheboygan: June 24. I took a single female in good condition at light at the Biological Station in 1969. Not previously reported from Michigan, although M.C. Nielsen informs me that he has taken the species, all males and chiefly at UV light, in neighboring Otsego County (May 18 - June 2) as well as in the Upper Peninsula (Chippewa and Schoolcraft counties, May 21 - June 11). Differs from the preceding species in having some yellow, as well as black spots, on the abdomen above and in having more dark spots on the hindwings.

52. *Estigmene acrea* Dru. Emmet, Cheboygan: June 16 - July 9. Evidently a very uncommon moth in our area; I have seen five specimens.

53. *Hyphantria cunea* Dru. Emmet, Cheboygan: June 24 - July 15. Our specimens are nearly

or pure white except for the black antennal shaft. Moore (1955) also lists *H. textor* Harr. from Cheboygan County, but I would refer all specimens to *H. cunea*.

54. *Apantesis virgo* L. Emmet, Cheboygan: July 12 - August 6.

55. *Apantesis parthenice* L. Emmet, Cheboygan: August 5 - 20. Our most common species of this genus.

56. *Apantesis virguncula* Kby. Cheboygan: June 30 - July 31.

57. *Apantesis arge* Dru. Cheboygan: August 9. A single specimen, taken by a student in 1967 and now in the UMBS collection.

58. *Apantesis phyllira* Dru. Cheboygan: July 10 - August 13.

59. *Apantesis nais* Dru. Cheboygan: July 10. My only specimen was taken at light at the Biological Station in 1950.

60. *Arcia caja americana* Harr. Emmet, Cheboygan: July 19 - August 18. Also Mackinac County, August 8. Unlike most moths, females seem more frequent than males. The MSU collection includes a dwarfed male with expanse not quite 4.5 cm taken at Petoskey, August 18, 1917.

61. *Hyphoraia parthenos* Harr. [*Parasemia parthenos*]. Emmet, Cheboygan: July 29 - August. There is one specimen in the UMBS collection, taken July 29, 1924 (also reported by Welch, 1915). One specimen from Douglas Lake in UMMZ was taken in August, 1928, without further data. J.H. Newman has seen a specimen from Wilderness State Park, Emmet County. I have a single specimen, taken in Luce County near the Upper Falls of the Tahquamenon River July 23, 1968 (spotted by Stephen G. Weller). Moore (1955) lists this rare species only from Chippewa, Cheboygan, and Iosco counties.

62. *Utetheisa ornatrix bella* L. [*U. bella*]. Emmet: August 18. My only specimen is a male taken in 1944 about 10:00 a.m. flying over a field of milkweed and goldenrod near McGulpin Point.

63. *Haploa contigua* Wlk. Cheboygan: July 10 - August 8.

64. *Haploa confusa* Lyman, Emmet, Cheboygan: June 14 - August 8. An exceedingly variable, confusing, and abundant species. Referred here are the specimens determined by Moore as *H. colona reversa*. Some specimens which key easily to *H. lecontei* in Forbes are also referred here, as are some which might resemble *H. militaris*, for all are the size of *confusa* and too small for the other species.

LITHOSIIDAE

65. *Crambidia pallida* Pack. Emmet, Cheboygan: July 20 - August 15. Scarce in collections; perhaps overlooked.

66. *Crambidia casta* Pack. Cheboygan: September 9. A single specimen in UMMZ was taken at light at Douglas Lake in 1934; no other data.

67. *Tigrioides bicolor* Grote [*Lexis bicolor*]. Emmet, Cheboygan: July 31 - August 12. Apparently quite scarce.

68. *Clemensia albata* Pack. Cheboygan: July 7 - 10. The only specimens I have seen from the

region are two in UMMZ, one from Douglas Lake (1932) and one from Burt Lake (1934). My only specimens were taken in Oceana County, July 15 - 23, 1944.

69. *Hypoprepia miniata* Kby. Emmet, Cheboygan: June 14 - August 15. One of our commonest moths.

70. *Hypoprepia fucosa* Hbn. Emmet, Cheboygan: July 8 - August 8. Like the preceding, a common moth at light.

71. *Lycomorpha pholus* Dru. Cheboygan: July 4 - August 14. Generally considered a rare moth in the state, this apparent mimic of the lycid beetle *Calopteron terminale* Say may be expected each summer flying by day near the Biological Station library, especially in early August.

CTENUCHIDAE

(This family is also known as Syntomidae, Amatidae, and Euchromiidae.)

72. *Cisseps fulvicollis* Hbn. [*Scepsis fulvicollis*]. Emmet, Cheboygan: June 27 - August 23. Comes to light, and also taken by day, including visits at hedge-nettle (*Stachys palustris*) and white sweet-clover (*Melilotus alba*).

73. *Ctenucha virginica* Charp. Emmet, Cheboygan: June 20 - July 24. Found both at light and as a diurnal species.

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