

(5)

ZOOLOGY 298

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PHALANGIDA AND PSEUDOSCORPIONIDA (CHELONETHIDA) OF MICHIGAN

Aims of the course: This problem represents the start of what I hope to develop into a species and distributional list of the Phalangida and Pseudoscorpionida of Michigan. At the same time, I hope to add to the knowledge of the life histories of some of the species.

Most of the time this semester was used in getting acquainted with the literature of these groups and in learning to prepare the specimens for study. I now have a bibliography consisting of 86 papers on the Pseudoscorpions and 44 papers on the Phalangida. As a start toward a private library on these two orders, I have obtained 12 papers on the Pseudoscorpions and 15 papers on the Phalangida.

Most of the laboratory time was spent in learning to prepare the Pseudoscorpions for study-----the technique of which is still far from perfected. I prepared eight slides in all, with at least two slides each of the three Michigan species so far taken.

I made up a Field Record and Habitat blank for these two groups--- a sample of which is included in this report.

So far the collections are too few and taken over so short a period of time that few definite statements can be made at this time.

PSEUDOSCORPIONIDA So far I have taken three species in Michigan. These represent two suborders and three families.

Suborder DIPOSPHYRONIDA

Family Neobisiidae There are keys to the genera of this family to be found in (Chamberlin '31) but at this time I cannot classify my specimens

below family rank with any degree of certainty.

My first record of the year was from Barry Co., Mich. on March 21, 1948 (Coll. No. PB 1 48). I took three that day beneath old logs in rather damp situations. My notes state that there had been three days of very warm weather preceding this, but that the frost had been in the ground up until three days ago. All specimens were active and one was holding a small insect in its chelicera when taken. On April 6, 1948 I took two more specimens of this family (Coll. No. PB 3 48) in Barry Co. These were taken beneath damp moss. On May 12, 1948 I took a single specimen from the Third Sister Lake area (Coll. No. PW 1 48). Again the situation was damp. While more collecting is necessary to be sure, it seems that this species(or species) prefers a habitat which is much damper than the following two species.

Suborder MONOSPHYRONIDA

Family Cheliferidae

Chelifer cancrroides Geoffroy My first spring record of this species in from an old house in Barry Co., Mich. (Coll. No. PB 6 48) on April 26, 1948. I took five specimens beneath the linoleum floor covering. This species seems to be much later in coming out than the Neobisiids. This house is well populated with *Chelifer* as I made a collection here on Sept. 3, 1947 (Coll. No. LP 2 47) in which I took ten specimens. During the early part of this semester (Feb. and early March) I made two trips to this house in an attempt to find how they wintered over. I made a fine search of the areas in which they were common last summer but could find no trace of them. At about two week intervals after this I searched this house but it was not until April 26th that I located any.

I have a record for this species from Cheboygan Co., Mich. (Coll. No. LC 4 47), taken on July 28, 1947. In contrast to the Neobisiids, this species prefers a very dry habitat. So far I have only taken it

in old deserted buildings.

Family Atemnidae

To my knowledge there is no key yet made to the genera and species of this family. These specimens are the Chelanops of the old classification (Comstock '12). I have yet to take specimens of this family this year. I do have however, a record from Cheboygan co., Mich. (Coll. No. LD 10 47) for July 29, 1947 and a record from Barry Co., Mich. (Coll. No. LP 1 47) on Aug. 28, 1947. In both cases these collections came from beneath bark. They came from trees that had not been dead so very long as the bark was just loose enough that it could be pulled away. Each time I have found them they were in rather large colonies. The situation was just slightly damp in both cases.

PHALANGIDA This is a difficult group to study this time of year since all but one species die off in the fall, and winter over as eggs.

Leiobunum formosum has been taken by me in great numbers this spring. My first record is from the banks of the Huron River near Ann Arbor, Mich. on March 29, 1948. I took three specimens of this species in nearly the same spot on Oct. 23, 1947. This seems to bear out what other workers have found---that L. formosum winters over in adult form. I only have a few specimens for late fall and early spring, but these are definitely smaller than the average sized specimens taken in a lot from the Third Sister Lake area (Coll. No. PW 2 48) on May 12, 1948. I want a much more extensive series from fall and early spring before I make any definite statement, but it may possibly be that they winter over as half or three-quarters grown individuals and do not reach full size until late spring.

I have records of this species from Barry, Lake, and Washtenaw Counties.

I can say very little about the rest of the Michigan species of Phalangida at this time. My first record for newly hatched young of the year came from Barry Co., Mich. on April 6, 1948 (Coll. No. PB 3 48). These were about 1 mm in length (body) and were white except for the eyes which were black. In later collections the specimens were starting to gain pigment.

I cannot identify any of these young Phalangids. It will probably be necessary to raise the young ones to maturity in order to identify them.

I am inclosing a key to the Cheliferidae for safe keeping.

FIELD RECORD AND HABITAT BLANK
(Phalangida and Pseudoscorpionida)

Order(s) taken: () Phalangida
() Pseudoscorpionida

Sheet No. _____

Locality _____

Co. _____ Locs Key _____

Date 19 _____ Time _____

Temp _____ Sky _____

Wind _____ Field Census Blank No. _____

Collector(s) _____ Collection Method _____

Abundance _____

HABITAT DESCRIPTION

I. NATURAL

Beach, inner-, middle-, outer-; Dry beach pool; Forest floor; Swamp;
Marsh; Meadow; Pasture; Cultivated Field; Uncultivated Field; Bog;
Road-side; Stream bank

II. ARTIFICIAL

Building (Dry, Moist, Wet) (Inhabited, Uninhabited)

NAME OF THE SUBSTRATE

Flat rock; Boulders; Gravel; Sand; Clay; Mud; Black mud; Marl;
Brown peat; Fallen timber; Dead standing trees;

NAME OF THE VEGETATION (Sparse or Thick)

Barren; Weeds; Brush; Aspens, Conifers, Hardwoods
Names of more important plants and trees present

OTHER FACTORS

(Dry, moist, wet) (Cold, cool, warm, hot) (Light, Shaded)

BOULET NOS. (Temporary Nos.) _____

COLLECTOR NOS. (Permanent Nos.) _____

SPECIES NOS. _____

ADDITIONAL NOTES (Finish on back of sheet if necessary)

A SYNOPTIC REVISION OF THE GENERIC CLASSIFICATION
OF THE CHELONIID FAMILY CHELIFERINAE

Joseph Conrad Chamberlin

Can. Ent. 63:289-294

Subfamily WITHINIAE

Diagnosis: Femoral articulation of legs I and II nearly vertical and of only limited mobility except in *Philomaoria* where the articulation is typically cheliferoid. Males with specialized sternal bristle-bearing areas except in *Philomaoria* which, however, is characterized by an abundant supply of loosely clustered microlyriforms especially on the last sternite. Female with vestitural setae of genital operculum loosely clustered, not arranged in definite linear sub-lateral rows. Genital sacs of male reduced and never developed as ramiform organs; coxal sacs invariably lacking. Foreclaws of tarsus of male symmetrically developed; tarsal claws and subterminal setae single. Male genital structures generally largely membranous and simple in structure compared to those of the Cheliferinae. Males with four blades with the exception of *Afrowithius*.

DIAGNOSTIC KEY TO THE TRIBES AND GENERA OF THE SUBFAMILY WITHINIAE

1. Carapacial, tergal, and palpal setae elongate and either simple or terminally denticulo-acuminate; seta II distad of EST; male without the usual characteristic sternal bristle patches; last sternite markedly hispidously granulate.
(*Philomaorini* trib. nov.) *Philomaoria* gen. nov.

Carapacial, tergal, and palpal setae thickened or variously clavate but never acuminate; seta II proximad of EST; mature male with more or less prominently developed patches of microsetae on at least a few of the sternal segments; eleventh sternite smooth or at most tessellate2

2. First three to six tergites entire or almost so; tergites heavily sclerotized and sharply defined from the intersegmental and interscutal membranes; divided tergites with the suture linear but sharply defined; last six to eight tergites roughly serrate along their posterior margin; males with sternal bristle patches on segments 8 and 9, vestigial on 6 and 7; indistinct tergal crests (morphologically unlike the tergal crests of the Cheliferinae) present in mature males; dorsal sclerites and pedipalps coarsely granulate; vestitural setae clavate; eye-spots only present.
(*Cacodemonini* trib. nov.) *Cacodemonius* gen. nov.

All but first and last tergites longitudinally divided (first tergite frequently divided in addition) sclerotization of tergites not as in *Cacodemonius*, the scutae merging imperceptibly into the membranous portions so that the posterior margins are not, and morphologically cannot be, serrate; males with sternal bristle patches variously disposed; in almost all cases adult males do not show tergal crests; dorsal sclerites and palps granulate or squamosely tessellate; with true eyes or eye-spots.

Withini tribe nov.3

- 3. Carapace broadest across its posterior margin, converging slightly but continuously anteriorly; tactile seta of tarsus IV subterminal in position ($\frac{3}{4}$ tarsal length removed from base of tarsus); (male with bristle patches developed on segments 7-9 inclusive) Parawithius gen. nov.
 Carapace not as in Parawithius; tactile seta of tarsus IV more nearly median than in Parawithius ($\frac{1}{2}$ to $\frac{2}{3}$ tarsal length removed from base of tarsus)6
- 4. Carapace with sides sub-parallel, as wide at anterior furrow as along posterior border; (males with bristles patches on segments 4 to 9 or 4 to 10 inclusive, with true eyes).....5
 Carapace broadest at anterior furrow or slightly anterior thereof, sides converging abruptly in front and gradually to the rear (eyes or eye-spots present; sternal bristle patches as in first part of couplet or otherwise).....6
- 5. Flagellum of five blades; male with weak but distinct tergal crests Afrowithius gen. nov.
 Flagellum with the normal four blades; male without tergal crests Withius Kew
- 6. Eye-spots only present; inter-scutal bristle areas not present; sternal bristle areas of adult male of normal type, occurring on segments 4-9 or 4-10 inclusive; palpal form typical, not excessively attenuate. Metawithius gen. nov.
 True eyes present, bristle areas of adult male interscutal in position and occurring in various combinations on segments 7-9; palps excessively slender and elongate, quite atypical in general appearance Dolichowithius gen. nov.

Subfamily Cheliferinae

Diagnosis: Femoral articulation of legs I and II oblique and freely mobile. Males without the specialized sternal bristle patches of the Withiinae. Vestitural setae of genital operculum of female arranged, in part at least, in distinct sub-lateral rows. Genital sacs of male (with one rare exception) strongly developed and voluntarily extrusible as the "ramshorn organs" of sexual display. Coxal sacs almost invariably present. Foreclaws of male always more or less asymmetrically developed. Tarsal claws and subterminal setae frequently cleft. Male genital structures more complex and more heavily sclerotized than in the Withiinae. The flagellum comprises three blades in all species known to me.

DIAGNOSTIC KEY TO THE GENERA OF THE CHELIFERINAE

(Males only)

- 1. Coxal sac absent.....2
- Coxal sac present.....3

- 2. Ramshorn organs of male absent; tergal crests prominent; chelicera with three galeal setae

Ellingseni gen. nov. isidius sp. nov.

- Ramshorn organs present; tergal crests absent or vestigial; chelicera with the usual single galeal seta

Haplochelif gen. nov.

- 3. Coxal sac with well differentiated atrium; statumen convolutum of male genitalia rounded anteriorly.....4

Coxal sac without atrium; statumen convolution of male genitalia deeply invaginated anteriorly and bearing in its center a forward projecting sclerotie "rod".....5

- 4. Chelicera with three distinct galeal setae; tracheal trunks internally puncto-striate

Ellingseni gen. nov.

Chelicera with the usual single galeal seta; tracheal trunks evenly striate.....5

- 5. Tergal crests distinctly developed; tarsal claws bifid; subterminal setae dentate; chela gaping.....6

Tergal crests absent or vestigial; tarsal claws simple; subterminal setae simple or dentate; chela may or may not gape.....7

- 6. Tactile seta of tarsus IV conspicuous and sub-median in position; dorsal sclerites and pedipalps typically smooth and polished; setae simple or denticulo-acuminate

Lissochelif gen. nov.

Tactile seta of tarsus IV inconspicuous and sub-terminal in position; dorsal sclerites and pedipalps typically granulate; setae distinctly thickened, sub-clavate or clavate.

Tyrannochelif gen. nov.

- 7. Subterminal setae simple.....Ectoceras Stecker

Subterminal setae dentate.....8

- 8. Chela gaping; dental margin of movable finger with a distinct, dentate, basal or sub-basal crest which fits into a corresponding depression in the fixed finger

Lophodaetylus gen. nov.

Chela not gaping; without any atypical crests or other modifications of the dental margin of the chela

Hanseni gen. nov.

- 9. Tarsal claws simple.....10
- Tarsal claws bifid.....12

- 10. Foretarsus with terminal tarsal spine; coxal spurs present; the subterminal setae simple or forked.....11

- 1. Tarsal claws bifid; subterminal setae dentate.....2
- 2. Tarsal claws simple; subterminal setae simple or dentate.....3
- 3. Tactile seta of tarsus IV conspicuous and sub-terminal in position; dorsal setites and pedipalps typically granulate.....4
- 4. Tactile seta of tarsus IV conspicuous and sub-terminal in position; dorsal setites and pedipalps smooth and non-granulate.....5
- 5. Tarsal claws bifid; subterminal setae dentate.....6
- 6. Tarsal claws simple; subterminal setae simple or dentate.....7
- 7. Median pair of arthropod plates fused into a single central plate (inferred on basis of male structures); included species principally South American.....8
- 8. Median pair of arthropod plates separate and distinct.....9
- 9. Sub-basal seta of chelicera absent.....10
- 10. Sub-basal seta of chelicera present.....11
- 11. Sub-basal seta of chelicera present.....12
- 12. Sub-basal seta of chelicera present.....13
- 13. Sub-basal seta of chelicera present.....14
- 14. Sub-basal seta of chelicera present.....15
- 15. Sub-basal seta of chelicera present.....16
- 16. Sub-basal seta of chelicera present.....17
- 17. Sub-basal seta of chelicera present.....18
- 18. Sub-basal seta of chelicera present.....19
- 19. Sub-basal seta of chelicera present.....20
- 20. Sub-basal seta of chelicera present.....21
- 21. Sub-basal seta of chelicera present.....22
- 22. Sub-basal seta of chelicera present.....23
- 23. Sub-basal seta of chelicera present.....24
- 24. Sub-basal seta of chelicera present.....25
- 25. Sub-basal seta of chelicera present.....26
- 26. Sub-basal seta of chelicera present.....27
- 27. Sub-basal seta of chelicera present.....28
- 28. Sub-basal seta of chelicera present.....29
- 29. Sub-basal seta of chelicera present.....30
- 30. Sub-basal seta of chelicera present.....31
- 31. Sub-basal seta of chelicera present.....32
- 32. Sub-basal seta of chelicera present.....33
- 33. Sub-basal seta of chelicera present.....34
- 34. Sub-basal seta of chelicera present.....35
- 35. Sub-basal seta of chelicera present.....36
- 36. Sub-basal seta of chelicera present.....37
- 37. Sub-basal seta of chelicera present.....38
- 38. Sub-basal seta of chelicera present.....39
- 39. Sub-basal seta of chelicera present.....40
- 40. Sub-basal seta of chelicera present.....41
- 41. Sub-basal seta of chelicera present.....42
- 42. Sub-basal seta of chelicera present.....43
- 43. Sub-basal seta of chelicera present.....44
- 44. Sub-basal seta of chelicera present.....45
- 45. Sub-basal seta of chelicera present.....46
- 46. Sub-basal seta of chelicera present.....47
- 47. Sub-basal seta of chelicera present.....48
- 48. Sub-basal seta of chelicera present.....49
- 49. Sub-basal seta of chelicera present.....50
- 50. Sub-basal seta of chelicera present.....51
- 51. Sub-basal seta of chelicera present.....52
- 52. Sub-basal seta of chelicera present.....53
- 53. Sub-basal seta of chelicera present.....54
- 54. Sub-basal seta of chelicera present.....55
- 55. Sub-basal seta of chelicera present.....56
- 56. Sub-basal seta of chelicera present.....57
- 57. Sub-basal seta of chelicera present.....58
- 58. Sub-basal seta of chelicera present.....59
- 59. Sub-basal seta of chelicera present.....60
- 60. Sub-basal seta of chelicera present.....61
- 61. Sub-basal seta of chelicera present.....62
- 62. Sub-basal seta of chelicera present.....63
- 63. Sub-basal seta of chelicera present.....64
- 64. Sub-basal seta of chelicera present.....65
- 65. Sub-basal seta of chelicera present.....66
- 66. Sub-basal seta of chelicera present.....67
- 67. Sub-basal seta of chelicera present.....68
- 68. Sub-basal seta of chelicera present.....69
- 69. Sub-basal seta of chelicera present.....70
- 70. Sub-basal seta of chelicera present.....71
- 71. Sub-basal seta of chelicera present.....72
- 72. Sub-basal seta of chelicera present.....73
- 73. Sub-basal seta of chelicera present.....74
- 74. Sub-basal seta of chelicera present.....75
- 75. Sub-basal seta of chelicera present.....76
- 76. Sub-basal seta of chelicera present.....77
- 77. Sub-basal seta of chelicera present.....78
- 78. Sub-basal seta of chelicera present.....79
- 79. Sub-basal seta of chelicera present.....80
- 80. Sub-basal seta of chelicera present.....81
- 81. Sub-basal seta of chelicera present.....82
- 82. Sub-basal seta of chelicera present.....83
- 83. Sub-basal seta of chelicera present.....84
- 84. Sub-basal seta of chelicera present.....85
- 85. Sub-basal seta of chelicera present.....86
- 86. Sub-basal seta of chelicera present.....87
- 87. Sub-basal seta of chelicera present.....88
- 88. Sub-basal seta of chelicera present.....89
- 89. Sub-basal seta of chelicera present.....90
- 90. Sub-basal seta of chelicera present.....91
- 91. Sub-basal seta of chelicera present.....92
- 92. Sub-basal seta of chelicera present.....93
- 93. Sub-basal seta of chelicera present.....94
- 94. Sub-basal seta of chelicera present.....95
- 95. Sub-basal seta of chelicera present.....96
- 96. Sub-basal seta of chelicera present.....97
- 97. Sub-basal seta of chelicera present.....98
- 98. Sub-basal seta of chelicera present.....99
- 99. Sub-basal seta of chelicera present.....100

(Females only)

- 1. Subterminal setae simple; sternal concavity of male genitalia not typical, not markedly invaginated anteriorly.....1
- 2. Subterminal setae dentate; sternal concavity typical.....2
- 3. Foretarsus with prominent terminal spine; sub-basal seta of chelicera present.....3
- 4. Foretarsus without terminal spine; sub-basal seta of chelicera absent.....4
- 5. Subterminal setae simple; sternal concavity of male genitalia not typical, not markedly invaginated anteriorly.....5
- 6. Subterminal setae dentate; sternal concavity typical.....6
- 7. Foretarsus with prominent terminal spine; sub-basal seta of chelicera present.....7
- 8. Foretarsus without terminal spine; sub-basal seta of chelicera absent.....8

- 8. Median cribriform plates large and conspicuous, sub-equal in length to the diameter of the anterior tracheal trunk. Haplochelifer gen. nov.
- Cribriform plates typical, much smaller proportionally than in Haplochelifer. Idiochelifer gen. nov.
- 9. Median cribriform plates fused into a single median plate.....10
- Median cribriform plates separate and distinct. Hysterochelifer gen. nov.
- 10. Chela gaping; South American genus.....Lophodactylus gen. nov.
- Chela not gaping; African genus.....Hanseni gen. nov.

Tribe Cheliferini

Diagnosis: Male: coxal sac entire, lacking a sharply differentiated atrium; statumen convolutum of male genitalia (with a few doubtful and rare examples) anteriorly deeply invaginated or retracted and bearing medianally in the depression an anteriorly projecting sclerotic "rod". Female: median pair cribriform plates separate and distinct.

Tribe Lissocheliferini

Diagnosis: Male: Coxal sacs present (one rare exception known in Ellingseni indicus) and with a sharply differentiated atrium; statumen convolutum of male rounded anteriorly and without the "usual" median anteriorly projecting sclerotic "rod". Female: Median pair of cribriform plates fused into a single central plate.