
CLASSIFICATION OF THE ENTOMOPHILOUS WASPS, OR
THE SUPERFAMILY SPHEGOIDEA.

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In the Journal of the New York Entomological Society for March, 1899, I separated the Hymenoptera into ten superfamilies, viz.: I. Apoidea, II. Sphegoidea, III. Vespoidea, IV. Formicoidea, V. Proctotrypoidea, VI. Cynipoidea, VII. Chalcidoidea, VIII. Ichneumonoidea, IX. Siricoidea, and X. Tenthredinoidea.

In the following pages I now propose to give a classification of the second of these superfamilies, or the Sphegoidea, a large group of wasps at one time confused with the genuine fossorial wasps, but which may be readily separated from them by having the hind angles of the pronotum not extending back to the tegulæ. Of all wasps these are the ones most closely allied to the bees.

Some of the best entomologists of the past — Leach, Dahlbom, Haliday, Westwood, and others — held that the group represented many distinct families; but quite recently some of our modern systematic workers — men of the highest attainments and ability — hold quite different views, treat this vast group as a single family, and would suppress or merge into a single genus many genera that were formerly considered good and distinct.

To use a slang expression, it is the old battle between the “lumpers” and the “splitters” revived, and the evolutionary problems taking place around us are ignored or misunderstood.

I believe firmly both schools, if we may call them such, are honest in their beliefs; but since I belong to the latter, it seems to me as if the students in the former were restrained or misled by affinities, or relationships, often obscure and indefinable, and overlook the fact that evolutionary changes have already been accomplished; and, because they

find certain affinities, would treat all of these important changes that have occurred through ages of evolutionary forces as of no value or significance.

This tendency to lumping I consider a retrogression in our systematic workers, tending to confusion and to unwarrantable changes in our nomenclature ; and it is to combat this tendency and make an effort to restore to their proper standing these suppressed families and genera, in accordance with the views held by the older entomologists, that I present herewith, in tabular form, the only possible way of demonstrating thoroughly the value and utility of divisions and genera, my ideas on the classification of this great group of wasps.

Before proceeding with my tables, however, and in order to afford a basis of comparison with my own views, it may be well to call attention to the views of two leading hymenopterists who have given much time and study to this group of wasps, namely, Mr. Wm. J. Fox, of the Philadelphia Academy of Sciences, and Dr. Franz Kohn, of the Royal Hofmuseums of Vienna, Austria.

In 1894, Mr. Fox, following the opinion of some of the recent European authorities, in his paper entitled "A Proposed Classification of the Fossorial Hymenoptera of North America," treats these wasps as representing a single family. He says : "It has been evident for some time that the existing arrangement, that contained in Cresson's Synopsis, is of little value, as it is too superficial. Entirely too many families, without characters to substantiate them, were recognized. The Sphegidae, for instance, were divided into no less than nine families. Accepting these nine families would, it seems to me, necessitate the erection of families for such genera as *Neolarra*, *Bothynostethus*, *Trypoxylon*, and others, which stand more or less isolated and yet possess characters which connect them in one way or another with the formerly existing families, and would form more distinct families were they recognized than, say, the *Mellinidae*, *Ampulicidae*, *Nyssonidae* or *Bembicidae*. How these nine

supposed families have been disposed of the following pages will show."

Mr. Fox then proceeds with his classification of the Fossores *without*, however, giving a table for recognizing these families or even mentioning the salient characters that would distinguish them. He has not even given a single character for distinguishing this so-called family, Sphegidæ, but begins by saying: "I would divide this vast family into five subfamilies as follows: Spheginæ, Pemphredoninæ, Bembicinæ, Oxybelinæ, and Crabroninæ."

Fox then goes on and separates these five subfamilies into tribes: The Spheginæ he separates into two tribes, Sphegini and Ampulicini, upon most superficial and totally unreliable characters when the exotic forms are considered; the Pemphredoninæ into two tribes, Psenini and Pemphredonini; the Bembicinæ, a most conglomerate mixture, into thirteen tribes, Philanthini, Mellinini, Nyssonini, Stizini, Bembicini, Neolarrini, Bothynostethini, Astatini, Diploplectrini, Miscophini, Larrini, and Trypoxylonini; while the Crabroninæ and Oxybelinæ are without tribes.

The Oxybelinæ were first separated from the Crabronidæ in 1874 by the Swedish entomologist, C. G. Thompson. I believe they represent a distinct family and have so treated them in my work.

In 1896, Dr. Franz Kohl, who had, however, years before published much on these wasps, published his "Die Gattungen der Sphegiden," a most valuable work, in which he treats these wasps as belonging to a single large family, the Sphegidæ, which he divides into generic groups, allied groups, subgenera and species groups.

The work is a masterpiece and should be in the hands of all students of these wasps.

Dr. Kohl recognized nine generic groups, arranged in the following sequence:

GENERIC GROUPS.	SUBGENERIC GROUPS.	ALLIED GROUPS.	SUBGENERA.	SPECIES GROUPS
I.				
Crabro,.....	Crabro, s. l.....	Crabro, s. str.....	Crabro, Kohl. Rhopalum, Kohl. Brachymerus, Dahlb. Lindenius..	{ Lindenius, Dahlb. Entomognathus, Dahlb. Encopognathus, Kohl.
		Anacrabro, Pack.		
	Oxybelus, Latr.....	Belomicrus, Costa.....	{ Belomicrus, Costa., s. str. Oxybelomorpha, Brauns.	
		Oxybelus, Costa., s. str.		
II.				
Pison, Jurine...	Pison, Jur., s. l.....	Pison, Jur., s. l.....	{ Parapison. Pison.	
		Aulacophilus, Smith. Trypoxylon, Ltr.		
	Pisonopsis, Fox.			
	Nilela, Latr.			
	Solierella, Spin.....	{ Sylaon, Pisc. Solierella spinolæ, Kohl. Solierella chilensis, Kohl. Nitelopsis, Saund.		
III.				
Miscophus, Jur..	Plenocalus, Fox.			
	Miscophus, Jur.....	Miscophus.....	{ Miscophus (genuine). Miscophus chrysis, Kohl. Miscophus handlischii, Kohl.	
		Soliotethus, Brauns. Miscophus, Brauns.		

I, yroda, Say.

Tachytes, Pauz., s. l.

Gastrosericus, Spin.
Homogambrus, Kohl.
Parapiagetia, Kohl.
Prosopigastra, Costa.
Tachyspex, Kohl.
Tachytes, Pauz.
Ancistromma, Fox.

IV.

Larra, Fabr....

Larraxena, Sm.
Larra, Fabr.
Motes, Kohl.
Paraliris, Kohl.
Notogonia, Costa.
Liris, Fabr.
Piagetia, Rits.
Laphyragogus, Kohl.
Leianthrena, Bingham.

Laphyragogus, Kohl.

Dinetus, Jur.
Palarus, Latr.

Sericophorus.....

Helioryctes, Sm.
Sericophorus, Sm. (Shuck.)
Sphodrotes, Kohl.

Zoyphium, Kohl.

V.

Astata, Kohl....

Astata, Latr. { Astata, Spin.
Dryudella, Spin.

Isolated.

Diploplectron, Fox.

GENERIC GROUPS.	SUBGENERIC GROUPS.	ALLIED GROUPS.	SUBGENERA.
	Isolated.		
	Heliocausus, Kohl.		
	Bembex	{ Bembex, Fab. Microbembex, Patt. Bembidula, Burm. Steniolia, Say. Monedula, Latr. Stizus, Handl. Handlirschia, Kohl. Sphecius, Dahlb.	
VI.			
Bembex, Fab.	Stizus, Latr.		
	Exeirus, Shuck.		
	Kohlia, Handl. (Isol.)		
	Gorytes, Ltr. (Hdl.) (Isol.)		
	Entomosericus, Dahlb. (Isol.)		
	Mellinus, Fab. (Isol.)		
VII.			
Alyson, Jur.	Alyson, Jurine, s. l.		{ Alyson, Jur., s. str. Didineis, Wesm.
	Bothynostethus, Kohl, s. l.	{ Bothynostethus, Kohl. Scapheutes, Handl.	
	Nyson, Latr. (Isolated)		{ Nysson. Hyponyssus, Cress. Acanthostethus, Sm. Philanthus, Kohl. Anthophilus, Dahlb.
VIII.			
Philanthus, Fabr.	Philanthus, Kohl., s. l.	{ Philanthus, Kohl., s. str. Trachypus, Klug. Philoponus, Klug. Aphilanthops, Patt. Cerceris, Latr.	{ Cerceris, Dhlb. (genuine). Nectanebus, Spin. Didesmus, Dahlb.
	Cerceris, Latr., s. l.	{ Eucerceris, Cress.	

IX.

Sphex, L.

Sceliphron, Ill. (Kby.), s. l.	Sceliphron, Ill., s. str.	{ Pelopoeus, i. sp. Sceliphron. Chalybion, Dahlb. Podium, Fabr., s. l. Trigonopsis, Perty.
Ammophila, Kirby.	Ammophila, Dahlb.	{ Dynatus, Spin. Ammophila, Kohl. Parapsammophila, Tschbg.
	Psammophila, Dahlb. Chlorion, Fabr.	

X.

Ampulex, Jur.

Sphex, L., s. l.	Harpactopus.	{ Pseudosphex, Tschbg. Calosphex, Kohl. Parasphex, Smith. Palmodes, Kohl. Gastrosphaeria, Costa.
	Isodontia, Patt. Sphex, s. str. Aphelotoma, Westw.	
Ampulex, Jur., s. l.	Ampulex, Jur., s. str.	{ Rhinopsis, Westw. Ampulex, Jur. (genuine).

Trirogma, Westw.
Dolichurus, Latr.Psen, Ltr. (genuine) = Mesopora
Wesm. = Dahlbomia, Wesm.

XI.

Pemphredon.

Psen, Kohl.	Psen, Latr., s. str.	{ Psen annulipes, Com. Mimesa, Wesm. Aporia, Wesm.
	Psenulus, Kohl (= Psen, Dahlb.) Pemphredon, Shuck. Ceratophorus, Shuck. Diphlebus, Westm. Passaloeus, Shuck., s. str. Polemistus, Sauss.	
Pemphredon, Ltr.		
Passaloeus, Shuck., s. l.		
Diodontus, Curt. (Isol.) Harpactophilus, Sm. (Isol.)		
Stigmus, Kohl.		{ Stigmus, Jur., st. Pazu. Spilomena, Shuck. Ammoplanus, Gir.

Every one must and will appreciate the immense work performed by Dr. Kohl in this contribution, and I feel sure the thanks of all working hymenopterologists go out to him for it. His tables are excellent, and with these and the fine figures of venation, representing nearly every known genus, no student will have any difficulty in placing in its proper genus any of these wasps he may capture, provided they are described.

I think, however, some will take exception to his peculiar views in regard to the rank and value he has given his generic groups, subgeneric groups, allied groups, subgenera and species groups. Nor do I think they will always agree with him in his arrangement of some of these groups. In some cases, at least, according to my views, he has not been successful in showing the true affinities of the groups, and has brought into juxtaposition groups and genera that are widely separated. For instance, I do not consider his group *Pemphredon* (representing the old family *Pemphredonidæ*) to have any affinity whatever with *Ampulex* (*Ampulicidæ*), next to which he has placed it.

Other similar incongruities might be pointed out, but since my views in regard to the rank, affinities and arrangement of these wasps are incorporated in the following tables, it will not be necessary to call attention to them here; they will become apparent in my table, and may be readily detected on a comparison of my arrangement with his.

My arrangement of the families recognized is as follows:

SUPERFAMILY II.—Sphegoidea.

Table of Families.

Middle tibiæ always with two apical spurs.....5.

Middle tibiæ with only one apical spur (occasionally absent in some males).

Median cell in hind wings not twice as long as the submedian, the latter often the longer; front wings with two or three submarginal cells; if with one only the head transverse, not quadrate..2.

Median cell in hind wings fully twice as long as the submedian; front wings with only one submarginal cell, very rarely with an indistinctly defined areolet.

Head transverse, the temples not very broad; scutellum margined, the postscutellum armed with a spine, thorn or forked process and with squamæ; front wings with the

first discoidal cell obliterated, rarely distinct, most frequently confluent with the second discoidal cell.....Family XV., Oxybelidæ.

Head large, quadrate or trapezoidal, the temples very broad; scutellum normal, the postscutellum unarmed without squamæ; front wings with the first discoidal cell always distinct, separated from the second... Family XVI., Crabronidæ.

2. Abdomen with a strong constriction between the first and second segments; eyes often emarginate within.....4.

Abdomen without a strong constriction between the first and second segments; eyes most frequently normal, rarely emarginate within.

Abdomen sessile, never petiolate.....3.

Abdomen petiolate or subpetiolate; cubitus in hind wings usually originating before the transverse median nervure, more rarely interstitial or originating slightly beyond it; transverse median nervure not sinuate 2-shaped; ocelli distinct; labrum most frequently hidden, rarely triangularly exerted, never free.....Family XVII., Pemphredonidæ.

3. Labrum large, free, well developed and triangularly elongated, much longer than wide; cubitus in hind wings usually originating beyond the transverse median nervure, the latter sinuate or somewhat 2-shaped; ocelli aborted, represented by cicatrices.....Family XVIII., Bembicidæ.

Labrum small, not free, usually completely hidden by the clypeus; cubitus in hind wings most frequently originating beyond the transverse median nervure, the latter straight, not 2-shaped; mandibles often emarginate on under side; ocelli distinct or at most with the lateral or hind ocelli aborted or wanting, indicated by cicatrices; front wings with a distinct stigma.....Family XIX., Larridæ.

4. Head wider than the thorax, the temples not narrow, rather broad; eyes most frequently normal; rarely deeply emarginate within, although often slightly emarginate within; abdomen most frequently sessile or subsessile, rarely petiolate (*Tachypus*, Klug), not elongate, ovate or oblong-oval, and most frequently with a deep constriction between the segments, or at least always with a constriction between the first and second; front wings with three submarginal cells, the second often petiolate, the second and third each receiving a

- recurrent nervure; cubitus in hind wings variable, interstitial or nearly, or originating far beyond the transverse median nervure.....Family XX., Philanthidæ.
- Head not wider than the thorax, the temples very narrow or flat; eyes always deeply emarginate within, or reniform; abdomen elongate, clavate, the first segment elongate, petioliform; front wings with two submarginal cells, the second, however, usually more or less indistinct or subobsolete; cubitus in hind wings originating beyond the transverse median nervure.....Family XXI., Trypoxylidæ.
5. Abdomen without a constriction between the first and second segments; intermediate coxæ not contiguous.....6.
- Abdomen with a more or less distinct constriction between the first and second segments, the first segment coarctate; intermediate coxæ contiguous; mesosternal suture wanting.....Family XXII., Mellinidæ.
6. Mesosternum produced into a forked process posteriorly; mesepisternum not separated; mesonotum with distinct parapsidal furrows.....8.
- Mesosternum normal, not produced into a forked process posteriorly; mesepisternum separated; mesonotum without parapsidal furrows, or at most only vaguely defined.
- Abdomen distinctly petiolated.....7.
- Abdomen sessile or subsessile.
- Labrum not free, entirely covered by the clypeus, or at most with only its apex visible; cubitus in hind wings originating *before* the transverse median nervure, rarely slightly beyond it, the latter most frequently straight, rarely sinuate or somewhat 2-shaped.....Family XXIII., Nyssonidæ.
- Labrum free, well developed, subtriangular or semicircular, wider than long; cubitus in hind wings originating usually before the transverse median nervure, the latter strongly sinuate or somewhat 2-shaped; ocelli distinct.....Family XXIV., Stizidæ.
7. Clypeus never produced posteriorly between the antennæ, the latter inserted above the base of the clypeus; metathorax most frequently rounded posteriorly, very rarely with acute angles; cubitus in hind

wings variable, most frequently originating *beyond* the transverse median nervure, more rarely interstitial . . . Family XXV., Sphegidae.

8. Clypeus posteriorly usually carinate or produced between the insertion of the antennæ so that its basal margin is beyond a line drawn from their base; anteriorly it is often rostriform carinate, or at least more or less produced medially; metathorax usually long, abruptly truncate posteriorly with the angles acute or toothed, although sometimes the angles are rounded; pronotum rather long, conically produced Family XXVI., Ampulicidae.

CORRESPONDENCE.

SPILOSOMA CONGRUA, Walk.

SIR,—As I understand the Rev. Mr. Fyles's recent article on *Spilosoma congrua*, it is contended (1) that *S. congrua*, of Walker, is the same as *S. antigone*, Strecker, and (2) that *cunea*, Drury, is also *antigone*, not *textor*, Harris.

To the former proposition I am inclined to assent on the following grounds:

1. Grote, who made the first examination of Walker's specimens, recognized in them a distinct species.

2. Walker knew *cunea*, Dru., and well separated it from his *congrua* in these words (Cat. Brit. Mus., III., 667):

A. Alæ anticæ albæ.

B. Abdomen non maculatum.

a. Alæ sat angustæ *cunea*, Drury.

b. Alæ latæ *congrua*, Walker.

3. Prof. Smith's statement (Ent. Amer., V., 119), that Walker's description of *congrua* does not apply to *antigone* was doubtless due to his not having before him any specimens of Mr. Fyles's variety "f."

We may then return to the old synonymy of the species:

S. congrua, Walk.

antigone, Strk.

The larva has been described in the following places:

1870. Saunders, CAN. ENT., III., 36 (as *H. cunea*).

1886. Hulst. Ent. Amer., II., 15.

1889. Soule & Elliot, Psyche, V., 263.



Ashmead, William H. 1899. "Classification of the entomophilous wasps, or the superfamily Sphegoidea." *The Canadian entomologist* 31, 145–155.

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