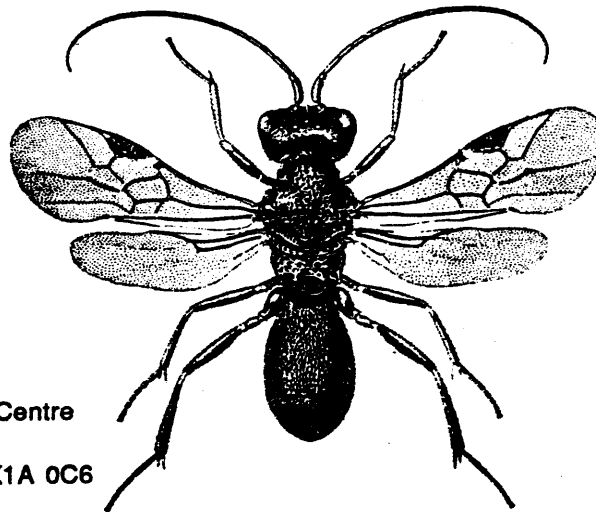


ICHNEWS



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EDITORIAL

Well, we are getting a little bit better; this issue gained two months on the last one. With this record we should be back on schedule by 1992 and have each issue of ICHNEWS out early in the year. The next issue of ICHNEWS will be edited by Dave Wahl; he will be sending out the 1990 questionnaire soon and it should be sent to him at the address above. Dave will also be preparing a new membership/ mailing list with up-to-date information, so there is no list of names in this issue again.

This issue is smaller and most of the space is taken up by references for 1988 and additions for 1987. With the help of Bob Carlson and Virendra Gupta, for whom I am grateful, I have spent considerable time searching computerized reference systems for as many references on Ichneumonoidea as possible. This includes many biological or non-taxonomic papers. I would like to know if this is worth it to the membership. It does take lots of time, but if most people on the mailing list are interested in taxonomic papers only, then we will not waste our time. Let us know by your comments. I have also decided to list only your papers that are in print, deleting those that are in press, thus saving duplication in the next issue. Your in press references are listed under the What's Happening section.

Another reason this issue is smaller is that there was not much information or news listed in the returned questionnaires. I have made notes for whatever I thought was of interest to us all. The only article that was received was a comment on wing venation by Bob Wharton. The other editors and I feel that we do not want ICHNEWS to get out of hand and become a primary publication source. On the other hand, as Wharton says, it can and should be a place for discussing important issues. So please keep those ideas and comments coming in and we will publish them as we see fit. What will be the next topic for discussion? Of course the wing venation discussion is far from over, but maybe it is closer to a resolution.

The answer to the quiz about the wasp on the cover of last issue is the family Apozygidae, genus Apozyx. There were only two people who offered an answer and both were wrong!

Those of you who are dissatisfied in not seeing further adventures of the Incredible Ichman, you will have to wait until next issue.

* * * * *

ICHNEUMONOID WING VENATION

A Comment on Sharkey's Proposal in ICHNEWS #11, 1988

by Robert A. Wharton

I congratulate Mike Sharkey for his attempt to propose a uniform terminology for wing veins - something that is desperately needed. Future workers will justifiably castigate us for the morass of confusing terminology we've created in the last few years. As so eloquently stated by Eady (1974), it is long past time for us to develop a system we can all use, and to apply it uniformly.

Nevertheless, I believe a modified Jurinean system (as exemplified by Sharkey's figures for Pentado-Dias and Marsh) is more practical for terminology than the system Mike advocates. There are three reasons for this: 1) over the last 30-40 years, this system has been used more widely than any other for taxonomic publications on Ichneumonoidea; 2) it does not reflect current ideas on evolution of hymenopteran venation, and is thus less subject to change when new evidence becomes available (i.e., it is a neutral system); and 3) I use it. A modified Jurinean system is of greatest value for the standardization of taxonomic descriptions, but this does not preclude its use in studies on hymenopteran phylogeny or evolution of wing veins. For example, in discussing the evolution of the Radial Sector, one might wish to hypothesize that it extends along the 1st cubital, up the 1st intercubital and along the 2nd and 3rd radials to the wing margin. A bit awkward, perhaps, but much less confusing than changing the system with each new idea.

Actually, I am more interested in stability than in defending any one system. The remainder of my comments thus pertain to the system Mike has proposed. This system is more complete than the one suggested by Eady, and certainly merits consideration.

1. Since stability is the goal, why dredge up poor Redtenbacher? Comstock gives ample credit to Redtenbacher, and that should suffice. We've called it the Comstock-Needham System for at least 70 years now, and those who want an historical perspective can read the voluminous early literature. After all, despite the significant advances made by Redtenbacher, five of the six names he proposed for longitudinal veins and several of the other ideas he put forth were all taken from earlier workers. Other reasons for not calling it the Redtenbacher System: cross-veins were not named, and Roman Numerals (rather than abbreviations) were used for veins. The heavy emphasis on abbreviations in the system proposed by Sharkey makes it more logical to call it the Comstock-Needham System, since these authors were responsible for the abbreviations.

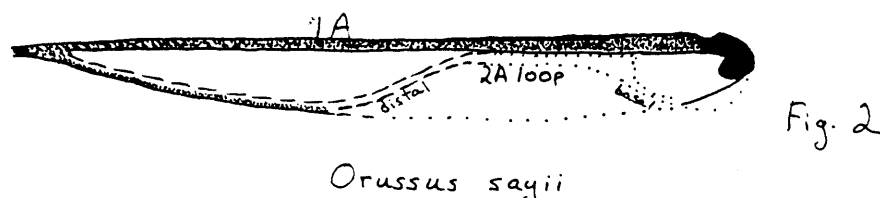
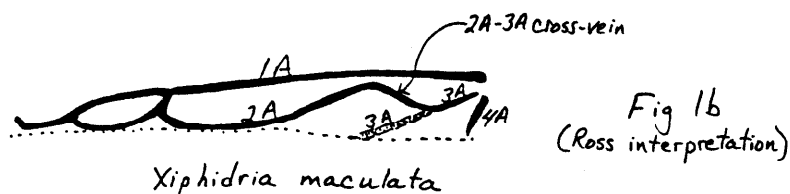
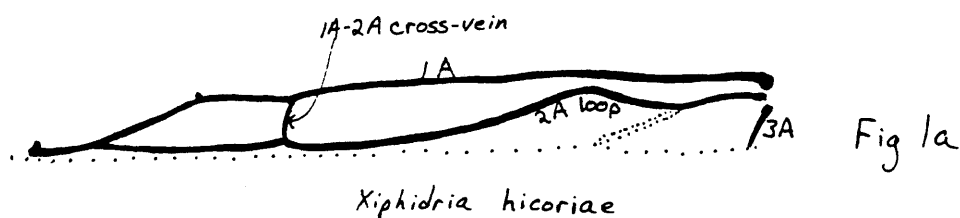
2. COSTAL VEIN (Fore wing). For the avowed purpose of stability and simplicity, Mike advocates C+R for the fused costal and radial veins basal to the stigma and R1 for the portion distal to the stigma. It would actually be simpler to designate them as C and R respectively. In Mike's Table 3, three workers use C for the portion basal to the stigma and only one uses C+R. The recent handbook on Hymenoptera edited by Gauld and Bolton uses R for the portion distal to the stigma, so there is some precedence for this usage as well. Although Comstock used R1, the majority of authors today still call it the metacarpus, so stability is not really an issue here. The suggestion that the costal vein ends before the stigma did not originate with Ross (1936), and was proposed for quite different reasons than suggested by Sharkey. Comstock provides a more detailed summary.

3. SUBCOSTAL VEIN (Fore wing). There is ample evidence of a subcostal vein in the Symphyta. It is true, as Mike notes, that this vein is relatively weak in some Xyelidae. As Comstock noted, however, it is very well developed in other xyelids (my specimens of Pleuroneura, for example) and in pamphilids. The Subcosta shows varying degrees of fusion with R in several other sawflies I have examined. Thus I have no difficulty in referring to the anterior margin of the fore wing basal to the stigma as C+Sc+R, even though I prefer C for simplicity. Also, since all of the elements are not completely fused in at least some ichneumonids, is the + sign appropriate when using C+R or C+Sc+R?

4. STIGMA. I never had any difficulty with the origin of the stigma until I took Mike's advice and looked at it more closely. All my observations were made on beasts with a costal cell, and it's not at all clear that the vein along the anterior margin is solely of costal origin. In many of the Hymenoptera I examined, the presumptive Radius fans out into a stigma. In others, the Radius appears to bifurcate. In these cases, the anterior margin of the stigma thus appears to have at least some contribution from the Radius. The stigma might even be a radial cell rather than a costal cell! I therefore agree with Mike that the stigma should be called just that rather than attempt to name it as a specific cell. Since everything is abbreviated, why not abbreviate the stigma as S?

5. RADIAL, MEDIAL and STIGMAL VEINS (Fore wing). The homologies here are still a matter of some debate. Although I do not entirely agree with the derivations Mike outlined, the suggested terminology is certainly acceptable, and I particularly like the idea of two cu-a cross-veins.

6. ANAL VEIN (Fore wing). It isn't really obvious that the anal cross-veins (labelled as 2 and 3 in Sharkey's Fig. 9) are "spurious" or "secondarily derived," since they are readily derived from symphytan venation. Although orussids are of rather limited value for a complete understanding of derivations since their venation is fairly reduced, Orussus sayii Westwood clearly shows one possibility for the origin of the anal cross-veins. In xiphidriids (and many others, but not cephids), 2A has a sharp anterior bend, producing a loop which closely approaches 1A (Fig 1a). In O. sayii, the anterior portion of the loop is contiguous with (but at least in some specimens not completely fused to) part of 1A (Fig. 2). The basal and



distal portions of this loop are clearly visible in most specimens I examined, with the distal portion nebulous to tubular and the basal portion spectral. The two anal cross-veins in braconids may thus be remnants of 2A, and that the portion of 1A between them would then actually be 1A+2A. Ross interprets the loop slightly differently than this. He provides evidence that the portion basal to the loop is 3A, the basal, transverse portion of the loop is a cross-vein between 2A and 3A, and the remainder of the loop and the distal part of the vein are 2A (Fig. 1b). This implies that the basal portion of 2A and the distal portion of 3A have been lost. I would also like to point out that in nearly all sawflies except orussids there is well-developed cross-veins distally between 1A and 2A, thus providing a second hypothesis for the origin of the two cross-veins in braconids: the basal braconid cross-vein is a remnant of the loop and the distal cross-vein the true 1A-2A cross-vein.

What, then, is Sharkey's 2A? According to Ross, it is 4A, but I would interpret it as 3A since it is the 3rd of three completely separated basal veins in the anal region of xiphidriids and other sawflies. However, I don't mind calling the remnants of 2A anal cross-veins, and abbreviating them 1a and 2a as Mike suggests, but 1-2A and 3-2A might be more appropriate.

7. OTHER "SPURIOUS" VEINS (Hind wing, see Sharkey's Fig 9). It might be worthwhile at the start to distinguish between spurious and secondary veins. Spurious (or adventitious) indicates a de novo origin, with no ancestry. Secondary, however, indicates a reversal (e.g., a character state may be masked in an immediate ancestor but expressed in the descendant and an earlier ancestor). The veins in braconids could thus be interpreted either as reversals or as persistent remnants with independent losses in the other taxa (if you believe the phylogeny in Mike's Fig. 8). Treating spurious and secondary synonymously is therefore misleading.

Now back to the veins themselves: as with the anal cross-veins discussed above, the remaining "spurious veins" in Braconidae can be similarly (though not always as easily) derived from veins still present in many extant symphytans. "Spurious vein 4" (in the radial cell) is present in xiphidriids, for example. "Spurious vein 7" may be interpreted in two ways. In xiphidriids and some others, the true 2A (not vein p of Mike's Fig. 7, which is 3A, not 2A: see above discussion of anal veins in fore wing), loops into 1A as a smooth curve. In *Xyela* and at least some siricids, 2A bends abruptly anteriorly to meet 1A, suggesting a cross-vein between 1A and 2A rather than 2A bending gradually into 1A. Thus spurious vein 7 is either the cross-vein between 1A and 2A (2A having been lost), or the distal portion of 2A (assuming a cross-vein was not present in the ancestor of the ichneumonid line).

Similarly, the postnervellus (Mike's vein 6 in Fig. 9) is readily derived from the xiphidriid m-cu, since it is in exactly the right place. As Mike notes, this makes for an interesting difference between cyclostomes (including alysiines and opiines) and non-cyclostomes. The break-up of the 1M cell in the hind wing must have taken place at about the same time as the divergence of the cyclostome and non-cyclostome groups in order to produce the two different patterns we see today (the loss of m-cu in nearly all non-cyclostomes and retention of 2-Cu in a number of them; and the loss of 2-Cu in cyclostomes and retention of m-cu in some of them). Although 2-Cu and m-cu are rarely (if ever) present together in Braconidae, the Odontobraconini and genera such as *Acrophasmus* may be particularly useful for discerning the true origin of m-cu.

My major criticism is Mike's apparent failure to appreciate the plasticity of apocritan venation, and in particular the relative ease with which veins come and go. Thus it's a waste of time looking for the origin of braconid

veins in extant ichneumonids, aculeates, and orussids since they all show considerable reduction from the patterns seen in other symphytans. I have therefore chosen xiphidriids in the above discussions because their venation pattern is similar to orussids, but much more complete. But I claim no particular insight to apocritan evolution, and could just have easily used other symphytans for the same arguments. In any case, the veins are there in braconids, and it seems much more logical to me to derive them from a primitive venation pattern, either as retentions or reversals, than to treat them as spurious.

Despite minor reservations about Mike's proposal, I'm really excited about the possibility of developing this into a system we can all use. ICHNEWS is the obvious place to air our views on the subject and work out an acceptable solution. The referred literature is already replete with attempts to develop standard terminology, and I see no need to contribute to the confusion which now exists. ICHNEWS has the advantage of informality and greater potential for exchange of ideas, and should provide us with an opportunity to resolve the question in a reasonable amount of time. I urge those of you using other systems or modifications to seriously consider Mike's proposal, and to use ICHNEWS to discuss alternatives if you have strong preferences.

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Obituary

GILBERT EDWARD JAMES NIXON
1905-1987

(Taken from an obituary prepared by T. Huddleston, 1987, Entomol. Mont. Mag. 124:255-260)

Dr. G. E. J. Nixon, distinguished Hymenopterist with the CAB International Institute of Entomology at the British Museum (Natural History) and specialist on the Proctotrupoidea and Braconidae, died August 22, 1987 after a short illness. At the age of 19 he was appointed to a temporary position at the British Museum where he developed his interest in Hymenoptera and later particularly the parasitic groups. His work on economic Proctotrupoidea led to his appointment on the staff of the Imperial Bureau of Entomology (later known as CIE and now as CAB Int'l. Inst. Entomol.). He remained in this position until his retirement in 1970 and continued to work in the Museum for one or two days each week until shortly before his death.

"Gilbert Nixon worked in the Department of Entomology for more than 60 years, a period that covered the tenure of all heads of that department... . During 56 of these years Nixon published over 90 papers, many of them of substantial length. In his early work he set new standards - standards which are now accepted as normal but were then exceptional in taxonomic work on parasitic Hymenoptera; he based his work on the examination of large amounts of material, his keys were comprehensive including much more than a single character for each separation and were fully illustrated. Nixon aimed to produce papers that anyone could use to identify the species about which he wrote. His pragmatic approach left little room for phylogenetic speculation that he stigmatised as being of little practical use. The only real fault to be found with his work is that he did not always give to nomenclatural matters the same scrupulous attention that he gave to the discrimination of the taxa."

His revisionary taxonomic work on the Braconidae and the Proctotrupoidea earned him a world-wide reputation as a first-rate taxonomist. He also wrote a series of papers on Aculeate wasps and hornets embodying his observations and interpretations of their behavior.

A complete list of publications by Nixon can be found in the obituary published by Huddleston cited above.

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MEETINGS, WORKSHOPS, etc.

Taxonomy and Biology of European Hymenoptera. September 3-9, 1989. Sheffield, England. The course will include lectures, practicals and demonstrations of techniques and it is hoped to link this with a one day symposium on current research on European Hymenoptera. The course is aimed principally at PhD students and other workers starting out on the study of Hymenoptera who wish to become more widely acquainted with this diverse and important insect order. The cost of the course including accomodation and board will be approximately 150. Contact: Donald Quicke, Department of Animal Biology, Sheffield University, Sheffield S10 2TN, England.

8th Parasitic Hymenoptera Traing Course. June 3-9, 1990 (tentative). University of Maryland, College Park, Maryland. This popular course is aimed at biological control workers or technicians as well as graduate students. Coverage will be to the family and subfamily level of all the major parasitic groups. Instructors are Paul Marsh, Eric Grissell, Mike Schauff, Arnold Menke, Dave Smith, Lubomir Masner and Dave Wahl. Costs will probably be \$300 (\$200 for students) not including accomodations. Contact Dr. Charles Mitter, Department of Entomology, University of Maryland, College Park, Maryland 20742.

Because of its popularity, the above course has had several invitations to present the course outside of Maryland, including Venezuela, Costa Rica and China. During the week of May 21-27, this course was presented at the University of Hawaii and sponsored by the Bishop Museum. Paul Marsh, Mike Schauff and Arnold Menke were joined by Lubo Masner, Dave Wahl and Jack Beardsley as instructors. The 22 participants in the workshop were mostly biological control workers from various areas of the Pacific Region including Australia, New Zealand, Guam, Papua New Guinea, Taiwan and Samoa as well as Hawaii. Plans are to expand the course to all Hymenoptera and present it again in Hawaii in a few years.

Entomological Society of America Annual Meeting. December 10-14, 1989. San Antonio, Texas. A meeting of the International Society of Hymenopterists will be held in conjunction with the ESA meetings. Contact Paul Marsh for further details.

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TECHNIQUES

The following is taken from Sharkey, M. J. 1988. A taxonomic revision of Alabagrus (Hymenoptera: Braconidae). Bull. Brit. Mus. (Nat. Hist.) Entomol. 57:311-437. It seems like an easy and good way to prepare specimens for not only light microscope observation but for scanning electron microscope work.

"If specimens are collected into alcohol, which is usual for Malaise traps, care must be taken when they are prepared for mounting. If they are air-dried directly from alcohol, setae often adhere to the cuticle, obscuring many morphological structures. Air-drying also causes the soft tissues of the

abdominal sternum to collapse and interesting characters are thereby lost. Critical-point drying avoids these problems and usually produces high-quality specimens, but this method is expensive and rather time consuming for large specimens. A simple method that achieves better or equal results is to immerse the specimens in 95% ETOH and 100% ETOH each for 24 hours, then in chloroform for two hours, after which time they are air-dried. This procedure stops the shrinking of soft membranes and all pilosity stands erect, away from the body. If sets of small cages or perforated polyester bags are used, the method is very rapid and great quantities of braconids may be processed in one run."

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COLLECTIONS

Part of Schmiedeknecht Collection Found in Kiev. Nikolaj Narolsky (Schmalhausen Institute of Zoology, 15 Lenin Str., Kiev-1, 252601 Ukraine, USSR) reports that he has found part of the old collection of Schmiedeknecht in the Department of Entomology collection at the Schmalhausen Institute. This collection is composed of 481 specimens in 374 species and varieties of 73 genera in the Ichneumonidae. The majority of the specimens belong to the Ichneumoninae (68 species), Campopleginae (50 species), Tryphoninae (50 species), Banchinae (31 species), Gelinae (98 species) and Ctenopelmatinae (62 species) with a few species from Pimplinae, Phrudinae, Microleptinae, Ophioninae and Anomaloninae. Dr. Narolsky states that this is possibly part of the collection bought by N. Kokujew from Schmiedeknecht. Anyone interested in seeing parts of this collection should contact Dr. Narolsky at the above address.

American Entomological Institute. The American Entomological Institute, Gainesville, Florida was recently awarded a Collection Improvement Grant from The National Science Foundation. The grant started in December 1988 and will run for three years. The funding is mostly for new collection storage equipment and a collection manager. To date, 90 new insect cases and 2,700 new cardboard storage boxes have been purchased (allowing addition of about 500,000 new specimens), as well as standard Cornell cabinets and drawers for better management of the type collection. David Wahl has been hired as collection manager; his duties include processing of loans, helping take care of visitors, handling the incorporation of new specimens into the collection, and enhancing the arrangement of the collection. With respect to the latter goal, all unsorted diplazontine, metopiine, microleptine (sensu Townes, 1969), banchine and ctenopelmatine specimens are now sorted to genus. A major effort is being made to update the ichneumonine collection. 15,000 Holarctic specimens have been sorted to genus and the arrangement of the main collection is being completely revamped. A number of researchers have visited the Institute to help with curation of various groups: Jim "Baby Hand" Carpenter (Vespidae), Bill Mason (microgastrine braconids), and Bob Wharton (opline and hormiine braconids). Anticipated visitors include Paul Marsh (rogadine braconids) and Mick Day (Pompilidae). As to collecting plans, the Institute is planning to support a collecting trip to South Korea in the Spring of 1990. Currently, 8 Malaise traps are being run in Japan by Mike Sharkey.

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BOOK REVIEW

The following review, prepared by Arnold Menke, will be published in the next issue of SPHECOS and is printed here with Arnold's permission.

THE HYMENOPTERA - Edited by Ian Gauld and Barry Bolton with contributions by Gauld, Bolton, T. Huddleston, M. G. Fitton, M. R. Shaw, J. S. Noyes, M. C. Day, G. R. Else, N. D. M. Fergusson and S. L. Ward; 332 p., published 1988 by British Museum (Nat. Hist.), London; 35 lbs.

"I have finally got my hands on a copy of this long awaited book and it is an impressive tome. It is divided into a broad spectrum of chapters that cover biology, economic importance, collecting and storage, adult and immature morphology, classification and systematics, evolution, key to superfamilies occurring in Britain, and finally overview treatments of the Symphyta, Parasitica and Aculeata including keys to families and individual family writeups. These overviews make up two thirds of the book. Included is an up-to-date terminal bibliography that is referenced throughout the text to document each chapter's presentation. Responsibilities of the various authors is not given unfortunately, but one can assume that Mick Day wrote the treatment of the Pompilidae and Nigel Fergusson the section on Cynipoidea.

"This book is designed to cover the fauna of the British Isles, but as the editors point out, it is generally applicable to western Europe and to a lesser extent the Holarctic Region. In spite of this regional approach, The Hymenoptera is a modern, up-to-date synthesis of the order and it includes much that is of general usefulness to a hymenopterist working anywhere in the world. This is particularly true of the chapters on biology, collecting and preservation, morphology, and evolution where the subject matter is quite basic. Many fine illustrations are scattered through the book including 8 pages of high quality color photographs depicting immature stages in particular but also some adults.

"Not being particularly well versed in biology I found the chapter treating this subject enlightening. The word parasitoid is defined and used instead of the less appropriate word parasite, and each time a different biological term is used and explained it is highlighted in capital letters to make it stand out (ENDOPARASITOID, SYNOVIGENIC, etc.).

"The chapter on mounting is generally ok but I personally find that gluing small wasps to the side of pin, a practice espoused here, is not too wonderful because viewing the dorsal and ventral parts of the thorax in particular can be difficult due to the pin itself. The discussion of mounting small hymens on points ("card pointing" in their parlance) is flawed. The authors advise that the specimen should be glued by its thoracic venter to the tip of the point. But this makes viewing the venter of the thorax impossible or nearly so. When mounting a small wasp to a point, it should be glued to the right side of the thorax so that the left side, the dorsum and the venter are all visible. This is essentially how the authors indicate that specimens directly glued to pins should be mounted. Personal whimsy seems to have crept into the discussion on point vs. rectangular card mounting. I see no rational explanation for stating that chalcidoids "should be mounted directly onto card rectangles", while it is ok to mount cynipoids and proctotrupoids on points. The entire discussion on mounting could have been improved with the addition of illustrations. There are none.

"I was glad to see a section on how to label insects, particularly the examples showing what should be included. However, insect labels should always include the name of the country! The first example simply states "NORTHANTS." (Northamptonshire, a county in England), while their second example gives the name of the country, AUSTRIA. These days taxonomy is global and material may be borrowed from all over the world. It is critical that

labels include country names. Northants. may be meaningless to someone outside of England.

"The section on morphology is excellent and, as in the biology section, each term is highlighted in capitol letters and explained. Synonymous terms are often mentioned in parenthesis. Morphology is an area where personal preference has generated considerable duplicity of terms. The authors are to be congratulated for generally making rational choices. I quibble with their rather arbitrary subdivision of the occipital carina into a ventral part that they term the "genal carina". Better to simply call the entire thing the occipital carina. One can always describe the condition of it if necessary. The description of the antenna is somewhat flawed. The authors fail to note that the flagellum is actually a single segment subdivided into units or "flagellomeres" or antennomeres. They continue the incorrect use of the word "segment" to denote these subdivisions (see my diatribe on this subject in Sphecos 14:28 and Chalcid Forum 9:12-13), and also continue to use those quaint chalcidological things called the funicle, clavus, and "anelli". The last is incorrectly spelled. The diminutive of the Latin word annulus (= segment) is annellus; hence annelli is the correct spelling.

"I was chagrined to see yet another term introduced for the thorax, i.e., "alitrunk"! It is bad enough that we have the mesosoma/thorax wars (see Sphecos 12:3), but then I guess the Brits always have to do things differently. Alitrunk has been used primarily for the thorax of ants up to now--it should have stayed put! The authors' apparently did not consult the rather extensive morphological discussion of the sphecid thorax in Sphecid Wasps of the World, and I think they should have, especially in reference to their remarks on pleural structure on pages 64-66. Many of the pleural structures that they discuss are not illustrated (epicnemial carina, epicnemium, prepectus, subalar pit, etc.), and because the usage of these and other terms is non-universal, it would have been helpful to know exactly what their terms refer to. The term suture is abused especially in the thoracic discussion. As Snodgrass has clarified (Smithsonian Misc. Coll. 146:1-48, 1963) most grooves should be called sulci. Their "pleural suture" is an example of correct usage. The metapleuron is subdivided in many Sphecidae contrary to their statement that it is undivided in "apocritans". Again they should have examined the Big Blue Book. Unfortunately (I think) the authors have continued O. W. Richards use of the nautical term "keel" for ridges and carinae on the thorax and elsewhere.

"The wing terminology employed is based on the Ross/Needham system, but the recent work of Wootton (1978, Syst. Ent. 4:81-93) has been incorporated. Wing terminology will be familiar to most aculeate taxonomists, but lovers of "radial cell", "cubita; cell" and so forth, will doubtless find fault. Hopefully they are in the minority of the user community (but see cell terminology proposed by Sharkey in ICHNEWS 11:1-12). Our current duplicity of wing terminology is unfortunate. It would be nice if all hymenopterists adopted the wing system used in The Hymenoptera, but that is like hoping for world peace. One change in wing terminology adopted from Wootton's work is "claval lobe" for the anal lobe of the hindwing. Use of this term is in the realm of scientific progress through sound research, and I personally have no strong objection to it.

"The small pads found apicoventrally on the tarsi of some Hymenoptera were termed plantulae by Bohart and Menke in Sphecid Wasps of the World. In The Hymenoptera they are called plantar lobes, but in any event they are not recorded as occurring in the Sphecidae, where in fact, they are fairly common.

"Although Snodgrass (1963, see above) makes it clear that tergum and sternum are the proper words for the major abdominal plates, the authors of The Hymenoptera continue the common error of tergite and sternite. "Laterotergite" and "-sternite" are correct, however, since they are parts of the respective terga and sterna. I found inconsistency in how these terms are spelled in the book. On page 241 in the description of the Pompilidae, the

terms terga and sterna are used correctly. The authors avoid the term metasoma by calling the apparent abdomen the gaster, but they then insist on calling the first gastral segment, segment 2! That is confusing to say the least, and inconsistent also, because on their figures 7 and 8 they use tergite 1 and sternite 1 for the first gastral segment. Oh well. On page 74 the authors find it necessary to indicate in parenthesis that abdominal segments 2-8 means "1-7 of gaster"! This would have been avoided if they simply called the first gastral segment 1. People who do these kind of things never think of the user! I was amused and pleasantly surprised to see that my tongue-in-cheek term "Day's Organ", first proposed by me in Sphecos 6:5, is now established (p. 74), although the origin of the name is not mentioned by the editors.

"In the discussion of larvae, the omission of any mention of the important papers of Evans on the Sphecidae, and the ordinal treatment edited by Evans that appeared in Stehr's 1987 book, is unfortunate. Perhaps the last appeared to late for inclusion but papers published as late as 1988 are in the book.

"The classification presented in Chapter 6 is noteworthy from an aculeate point of view since the authors recognize only three superfamilies: Chrysidoidea, Vespoidea and Apoidea (containing the sphecids and bees). The Vespoidea contains the ants, the scolioids, the tiphioids, the pompiloids, the vespoids and related groups. The big bombshell is the Apoidea. Most New World bee workers will not accept a single bee family Apidae, but that is precisely what is presented in this book. They point out that Sphecidae may be paraphyletic with respect to Apidae and they may be right. I applaud the reduction in number of bee families, but bringing it down to one is perhaps a bit to far. The authors are certainly inconsistent in their recognition of families in the Aculeata. Although they recognize only Apidae, they maintain the families Masaridae, Eumenidae and Vespidae while noting (p. 232) that Carpenter has united them under Vespidae in his cladistic analysis! They go on to remark that "whether this apparently logical step gains widespread acceptance awaits the test of time....". Well they didn't wait for time to pass, they simply rejected Carpenter's landmark study and maintained the three families. This is rather amazing in light of their declaration on p. 88 that "Where two classifications differ, and only one of them recognizes demonstrably holophyletic [monophyletic] groups, we have accepted the cladistic classification". Oh yeah? Then why Masaridae, Eumenidae and Vespidae? They point out that prior to the introduction of the cladistic method by Hennig, that "acrimonious disagreements between experts were common." Well apparently cladistics hasn't changed anything! They sidestep the issue by declaring on page 232 that "....for the purposes of this book the eumenids are regarded as separate from the vespids at family-level". That smacks of sentimentalism for sure. Is this the way to advance the foreskin of science? Come on you guys, give us a break! By the way, in spite of the 1982 date on the journal, Carpenter's landmark paper on the Vespidae appeared in December, 1981 (that is when my copy of Syst. Ent. arrived here).

"I was amused to see that the authors of The Hymenoptera recognize 21 families in the Chalcidoidea, while admitting that the group is about the same size as the Ichneumonoidea in which they recognize only two families. Isn't it about time that chalcid workers break away from tradition and begin reducing the number of families? After all it is well recognized by chalcid workers, at least the younger ones, that chalcidoid families are almost impossible to define. The logic espoused by the authors of The Hymenoptera in defense of placing all bees in one family applies equally well to the Chalcidoidea where at best only a handful of families are defensible. Again tradition dies hard.

"I haven't tried out the keys to superfamilies or families to see how they work, but they are based largely on the British fauna. I was intrigued by the wing fold characters used to separate Sphecidae and Apidae in the key to families (p. 221) and wonder if it will hold up on a world basis in all genera.

"In passing through the familial treatments, I noted perpetuation in the Eucollidae of the inept term "cup", coined by Lewis Weld, for the elevated, flat plate on the scutellum. "Cup" does not convey the appearance of this unique structure; scutellar plate is a far better descriptor. Tradition dies hard doesn't it! Trybliographa is misspelled on pages 142-143. The discussion under Chrysidoidea (page 223) does not include mention of Carpenter's 1986 cladistic analysis of the included families even though the paper is in the References section at the end of the volume and is listed after some of the family treatments. The use of the superfamily name Apoidea for Sphecidae and the bees may come as a shock to some, but Apoidea has priority over Sphecoidea. On page 248 the authors elaborate on their rationale for putting all bees in a single family Apidae, and it is a reasonable argument, but again their pragmatism is clouded by retaining Masaridae, Eumenidae and Vespidae! Their argument for using Apidae applies equally well for recognizing a single family Vespidae.

"In summary The Hymenoptera is a valuable resource on the order and the book should be on the shelf of any hymen lover. The deficiencies noted are relatively minor and do not detract from its overall usefulness. I feel, however, that the authors lost an opportunity to present a system of family recognition that comes closer to making them equivalent units (in their defense, however, I must add that a) modern analyses are needed in some superfamilies before realistic family limits can be achieved, and b) true equivalency of families probably will never be achieved since such concepts vary from one person to the next!)."

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WHAT'S HAPPENING

(As in last issue, this should be called What's Happened! Many of the papers listed as in press are probably published by the time you receive this issue. Also, I have not listed complete addresses for those mentioned since there will be an up-dated mailing list completed next year.)

C. van ACHTERBERG, Leiden. Papers in press: Revision of western palaearctic Phanerotomini; Pheloura gen. nov., a neotropical genus with an extremely long pseudo-ovipositor; Four new genera of Braconinae and Rogadinae from the Oriental Region; Notes on the Odontoscopus varistigma-group; Revision of the subtribe Pseudohelconina nov.; Revision of the subtribe Mesocoelina Viereck. Current projects: Studies of the genera Foersteria and Polydegmon; Euagathis from Sulawesi; phylogeny of the subfamilies of Braconidae; Afrotropical Rogadini; European species of the genus Aleiodes; genera of Agathidinae from Indo-Australian Region; subfamily Betylobraconinae; catalog and reclassification of Braconidae described by Haliday; Palaearctic species of Macrocentrus; Paleotropical species of Macrocentrinae; key to the families and subfamilies of the Hymenoptera in Europe.

B. K. AGARWALA, India. Papers in press: Biology, ecology and control efficiency of aphid parasitoid Trioxys indicus: a review and bibliography. Current projects: parasitoid complex of pine aphid Cinara atrotibialis.

A. D. AUSTIN, Australia. Papers in press: A new genus of baeine wasp from New Zealand associated with moss; Revision of the genus Buluka; A revision of the Old World Parabaeus; The taxonomy of New World Microgastrine Braconids parasitic on Diatraea spp.; Two new species of Bracon from Australia parasitic on eucalyptus leaf-mining sawflies, Phylacteophaga spp.. Current projects: genera of Australian Microgastrinae; species Revision of Microplitis and Miropotes; revision of the Cercobraconinae.

- S. A. BELOKOBYLSKIJ, Leningrad. Papers in press: A new and little known taxa of braconids of the subfamily Helconinae from the Far East of the USSR; Palaearctic braconids of the genus Spathius: labdacus, urios and leucippus species groups; Revision of the Palaearctic species of the genus Braunsia; Far Eastern species of braconid of the genera Dirrhope and Mirax; systematics of braconids of the genus Diospilus; Genera of braconids new to the USSR.
- A. BEYARSLAN, Turkey. Current projects: faunistic study of the Braconidae of the Thracian part of Turkey.
- S. BORDERA, Spain. Papers in press: Study of the genera Ophion and Eremotylus in Spain. Current projects: studies of the subfamily Cryptinae of Spain.
- J. BRAMBILA, Florida. Current projects: Mesostenini of Florida; checklist of insects in San Felasco Hammock State Preserve, Florida.
- M. CAPEK, Czechoslovakia. Papers in press: The Braconidae as parasitoids of clearwing moth larvae. Current projects: Braconidae as parasitoids of forest tortricids and geometrids.
- D. CAVE, Honduras. Current projects: parasitoids of Noctuidae in crops, particularly Mocis latipes; catalog of parasitic Hymenoptera in Honduras; introduction of Cotesia plutellae against the diamondback moth; re-introduction of Cotesia flavipes against stem borers.
- CHEN Xuexin, Peoples Republic of China. Papers in press: Descriptions of two new species of Pachymelos from China. Current projects: studies of the genera Brachyscleroma (Ichneumonidae) and Aleiodes and Phanerotomella in China; cataloguing the species of natural enemies of rice insect pests in China.
- CHOU Liang-yih, Taiwan. Current projects: taxonomy of the Alysiinae of Taiwan.
- C. DASCH, Ohio. Current projects: starting a revision of Nearctic microleptine Ichneumonids.
- M. FISCHER, Vienna. Current projects: revision of the Opiinae of the Townes collection from New Guinea; review of Opiinae collected by Macek, Haeselbarth and Munk; Scandinavian Opiinae and Phaenocarpa collected by Haeselbarth.
- T. FINLAYSON, Canada. Current projects: classification of the final instar larvae of Aphidiidae.
- M. FITTON, London. Current projects: book-length introduction to Ichneumonidae based on British/European fauna; British Oedemopsini (Ich., Tryphoninae).
- I. GAULD, London. Current projects: the taxonomy of Costa Rican Pimplinae, Xoridae, Lycorinae, Anomaloninae, Phurdinae and some Mesostenini; writing "An introduction to Ichneumonidae of tropical Central America"; projected - a volume entitled Hymenoptera of Central America: an introduction.
- S. GUPTA, Florida. Current projects: survey of Ichneumonidae of Florida, their distribution and abundance with reference to climate, etc.
- V. K. GUPTA, Florida. Papers in press: Contributions of Gerd Heinrich to the study of subfamily Ichneumoninae together with a bibliography of his publications; Two new genera of porizontine ichneumonids. Current projects: monographing the Ichneumonidae of Florida; distribution and abundance of ichneumon-flies of Florida; revisions of Tryphoninae ichneumonids.

E. HAESELBARTH, Munich. Papers in press: Erasmus plans to retire in 1989 and will be finishing up several projects, mainly revisions of European Ichneutes and Perilitini (Braconidae).

HE Junhua, China. Papers in press: Descriptions of two new species of Pachyumelos from China; Five new records of Zeles from China. Current projects: taxonomic studies of Brachyscleroma, Collyria (Ichneumonidae) and Aleiodes, Phanerotomella (Braconidae); cataloging the species of natural enemies of rice pests from China; studies on the intraspecific variety of Trichogramma dendrolimi in China..

K. S. HEBLE, India. Papers in press: Biology and biometry of Goryphus nursei (Cam.), a pupal parasite of spotted bollworm. Current projects: taxonomic studies on ichneumonids from Maharashtra, India; pests of cotton and castor, their control; biology of Chirotica sp..

R. HINZ, Germany. Current projects: taxonomic studies of the genera Lithades, Sympherta and Delopia, particularly the eastern Palaearctic region.

K. HORSTMANN, Germany. Current projects: revision of western Palearctic Cryptinae with brachypterous females; revision of western palearctic Listrognathus species and related genera; revision of some species groups of Diadegma; revision of western and southern European Pristomerus species; type revisions of Ichneumonidae described by Schmiedeknecht.

J. W. JOHNSON, Michigan. Jim has recently moved from Missouri to Michigan where he will be on the staff of Michigan State University. His new address: Department of Entomology, Michigan State University, 243 Natural Sciences Building, East Lansing, Michigan 48824-1115.

R. KLUNKER, Germany. Current projects: side effects of larvicide Neoporex on parasitoids; faunistic investigations on parasitoids of dung-breeding flies in dependence from season and dung-management; rearing of parasitoids for biocontrol experiments.

J. A. KOLAROV, Bulgaria. Current projects: check list of Bulgarian Ichneumonidae.

M. KOPONEN, Finland. Current projects: check list of Braconidae of eastern Fennoscandia; list of Braconidae types described by Wolter Hellen.

D. M. LANFRANCO LEVERTON, Chile. Current projects: phylogeny and biogeography of the Labeninae.

L. LEBLANC, Quebec. Current projects: rearing and description of the larvae of the Nearctic species of Dolerus (Tenthredinidae) that feed on horsetails.

K. MAETO, Japan. Current projects: Microgastrinae of Japan and Far East, especially Cotesia and Glyptapanteles; braconid parasitoids of Asphondylia; Braconidae of Krakatau Islands; parasitoid complex of Dendrolimus spp.; karyotypes of Microgastrinae species.

P. M. MARSH, Washington. Papers in press: Hymenoptera of Bermuda Islands. Current projects: revision of the Nearctic species of Aleiodes (with S. R. Shaw); revision of the Western Hemisphere species of Heterospilus;

identification manual for the braconid parasitoids of the Russian wheat aphid; description of a new Pauesia introduced into South Africa against Cinara; starting major project on an identification manual of genera of Braconidae for Central and South America (with S. R. Shaw, R. A. Wharton, M. J. Sharkey, D. Quicke, and J. B. Whitfield).

W. R. M. MASON, Ottawa. Current projects: phylogeny of the Hymenoptera; generic revisions of the Cardiochilini and Miracinae. Bill is happy to note that he is fully recovered from recent heart surgery.

A. A. NASROLLAHI, Iran Current projects: biological control of corn stem borer using larval and egg parasites.

H. H. J. OEHLKE, Germany. Papers in press: "Zur Preparation xylobionter Insekten larven; zum Stabd der Erfassung von Hymenoptera in der DDR, die als Parasitoide oder Pradatoren voitskam werder; zu Aspekten des Biotop- und Artenschutzes; Fauna DDR: Sphecidae. Current projects: Katalog Ichneumonoidea, Revision Pimplinae (westpal.); Fauna DDR: Aculeata." My appologies to Joachim but your handwriting was difficult to read!

A. M. PENTADO-DIAS, Brazil. Papers in press: Morphology and biology of Glyptapanteles concinnus; Biology and morphology of Gnathopleura quadridentata. Current projects: taxonomy and biology of parasitoids in the Sao Carlos region, Sao Paulo, Brazil.

C. C. PORTER, New York. Papers in press: Revision of the Groteini of Chile; The genera Hoplismenus and Platylabus in the primera Region of Tarapaca; Athyreodon in the northern Neotropics; Natural history notes on Zacremnops in Florida and south Texas. Current projects: Monograph of the South American Trachysphyrus generic group.

D. L. J. QUICKE, England. Papers in press: Reclassification of some Braconinae described by Fabricius; Reclassification of some Neotropical Braconinae; Four new genera of the Plesiobracon Cameron group; Inter-generic variation in the male genitalia of the Braconinae; A new Neotropical genus and species of Coeloidini; A new genus and species of Adeshini; Two new genera and species of Braconinae from Brunei; A new Indo-Australian genus of Braconinae parasitic on Hispidae; Reclassification of some New World species of Braconinae; A new species of Myosoma parasitic on the stem-borer pest, Chilo partellus in Kenya; New host records for genera and species of Braconinae; Parasitic wasps of the genus Archibracon Saussure; The Indo-Australian and E. Palaearctic braconine genus Euurobracon. Current projects: revision of world braconine genera; revision of selected Australian braconine genera; function of metasomal scent glands; preliminary studies for revision of W. Palaearctic species of Bracon; phylogeny of braconidae subfamilies.

D. ROSEN, Israel. Current projects: completing a series of papers on the Aphidiidae of Israel.

C. REY DEL CASTILLO, Spain. Papers in press: Palaearctic species of Banchini and Glyptini represented in the National Museum of Natural Science of Madrid; Contribution to the knowledge of the Lissonotini of Spain: II. the genus Lissonota. Current projects: revision of the Palaearctic species of the subgenus Loxonota; the genus Odinophora and the nomenclature of the species; new records of species of Lissonota in the west Palaearctic Region; systematics and biology of Pimplinae of Spain.

G. van ROSSEM, The Netherlands. Papers in press: Data regarding the genus Cryptus from the Canary Islands. Current projects: studies of Palaearctic Oxytorinae.

E. RUIZ C., Mexico. Current projects: Ichneumonidae of Tamaulipas; hymenoptera from "Rancho El Cielo", Gomez Farias, Tam., Mexico.

J. SAWONIEWICZ, Poland. Papers in press: Revision of some type-species of European Ichneumonidae, 4 and 5; Revision of European species of the subtribe Endaseina, II. Genus Amphibulus; Revision of European species of the subtribe Endaseina, III. Genus Endasys; Ichneumonidae of meadow research sites on the Masovian Lowland. Current projects: revision of western Palaearctic Thrybius and Xylophrurus; the species of Cryptus (Cryptus) described by J. L. C. Gravenhorst.

P. L. SCARAMOZZINO, Italy. Current projects: List of generic names of Hymenoptera.

H. SCHNEE, Germany. Papers in press: Revision of Anomaloninae described by Gravenhorst; Phaenology and host records of some Anomaloninae.

M. SCHWARZ, Austria. Papers in press: Ergebnisse von Typenuntersuchungen bei Schlupfwespen (Hym., Ich., Cryptinae). Current projects: revisions of various genera of Cryptini in the western palaearctic Region (Enclisis, Caenocryptus, Nippocryptus, Agrothereutes, Mesostenus) and also Gelis.

J. SELFA, Spain. Papers in press: Two new Spanish species of the genus Ichneumon. Current projects: revision of the Spanish Ichneumoninae; study of the biology of Chilo supressalis and associated parasitoids in the Valencian Community.

M. J. SHARKEY, Ottawa. Papers in press: A hypothesis-independent method of character weighting for cladistic analysis; A key and notes on genera of Braconinae from American north of Mexico with descriptions of two new genera and three new species. Current projects: tribal classification of the Agathidinae; phylogeny of the Braconidae defining major lineages within the family; key to the subfamilies of Braconidae of the world; biology and keys to the parasitoids of the apple ermine moth; new method of weighting cladistic characters using character compatibility (a new compatibility technique); revision of Zacremnops; revision of the Agathidinae of Taiwan. Mike is presently on a one year fellowship until March 1990 at the National Institute of Agro-Environmental Sciences in Japan where he will be doing collecting and preparing a synopsis of the Japanese Agathidinae. His address: c/o Dr. Matsumura, Division of Entomology, National Institute of Agro-Environmental Sciences, Kannondai 3-1-1 Yatabe, Tsukuba, Ibaraki 305, Japan.

M. R. SHAW, Scotland. Papers in press: Parasitoids of European butterflies and their study; A host record for Stilbops limneriaeformis in Scotland; Survey of parasitoids of British butterflies; Cosmophorus cembrae new to Britain; More Trigonalis hahnii in Norfolk. Current projects: biology and host associations of W. European Ichneumonoidea; revision of W. Palaearctic Aleiodes; introductory handbook to British Braconidae.

S. R. SHAW, Wyoming. Current projects: revision of Nearctic Aleiodes (with P. Marsh); studies of Neotropical genera of Rogadinae. Scott has recently moved

from the Museum of Comparative Zoology, Harvard to the University of Wyoming where he will be teaching insect systematics and be in charge of the departmental collection (his new address: Department of Plant, Soil and Insect Sciences, Box 3354, University of Wyoming, Laramie, Wyoming 82071). Congratulations Scott!

A. TAEGER, Germany. Current projects: additions to the revision of Palaearctic Orgilus; studies in Nearctic Orgilus.

C. THIRION, Belgium. Current projects: Gasteruptiidae of Belgium and adjacent areas; genus Cratichneumon of Belgium and adjacent areas.

H. K. TOWNES, Florida. Current projects: Tryphonini and Eclitini of the Nearctic Region. Henry reports that the American Entomological Institute has received a three year grant from the National Science Foundation to finance a collection manager (Dave Wahl) and for additional insect cabinets and boxes. Congratulations Henry, Marjorie, and Dave!

D. B. WAHL, Florida. Papers in press: A revision of Benjamina; Further notes on preparation of exuviae of parasitic Hymenoptera; The biology, egg and larvae of Acoenitos dubitator (Panzer). Current projects: generic revision of Alomyini; higher level relationships with Campopleginae; phylogeny of Polysphenotini; phylogeny of Labeninae and placement of Brachycyrtus; Ichneumoninae of Costa Rica

A. K. WALKER, London. Papers in press: Synonymy of two Apanteles species parasitizing the coconut flat moth, Agonoxena argaula; Annotated checklist of New Zealand Hymenoptera.

A. and W. WALTER, Austria. Current projects: distribution of Austrian Ichneumoninae.

D. WILLIAMS, Canada. Current projects: revision of the braconid genus Pseudognaptodon. Daryl reports that he recently took a position with the Canadian Forestry Service as a technician in the Forest Insect and Disease Survey program; in addition to being curatorial assistant in the forest insect museum, he will also assist in insect pest management research.

J. B. WHITFIELD, Missouri. Papers in press: Identity and phylogenetic significance of the metapostnotum in the non-aculeate Hymenoptera; A revision of the Nearctic genus Pholetesor; Larval hosts of the microlepidoptera of the San Bruno Mountains. Current projects: tribal classification of the Rogadinae excluding Rogadini (Exothecini, Hormiini, Pambolini, Rhysipolini, Gnaptodontini, etc.); descriptions of Apanteles spp. reared from leafmining Lepidoptera, with keys; phylogeny of a Microgastrinae group (most likely Glyptapanteles or Microplitis) and its symbiotic viruses.

YOU Lan-shao, China. Current projects: studies of Braconidae of tea gardens in China; Microgaster and Microplitis of China; taxonomy of the genus Apanteles in China; study of Macrocentrus of Chilo niponella in reeds.

D. YU, California. Current projects: computerization of the family Ichneumonidae of the world including all published names, synonyms, distribution, hosts, type depository and pertinent taxonomical information.

H. ZETTEL, Austria. Papers in press: Revision of the genera of Cheloninae with descriptions of new genera and species; The Australian species of the genus Phanerotoma; Two new Phanerotoma species from the Mediterranean Region; The genus Phanerotomella.

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Additional Publications for 1987

- Adashkevich, B. P. and E. K. Saidove. 1987. Features of the development of Habrobracon hebetor (Hymenoptera: Braconidae) during rearing in the laboratory. Zool. Zhur. 66:1509-1515.
- Aktumsek, A. and M. Y. Aksoylar. 1987. Fatty acid composition of Pimpla turionellae (L.) (Hymenoptera: Ichneumonidae). Doga. Biyol. Serisi 11:10-18.
- Alvarado-Rodriguez, B. 1987. Parasites and disease associated with larvae of beet armyworm Spodoptera exigua (Lepidoptera: Noctuidae), infesting processing tomatoes in Sinaloa, Mexico. Fla. Entomol. 70:444-449.
- Aubert, J. F. 1987. Mise au point pour une nouvelle revision des Ichneumonides Pimplinae, Tryphoninae, Xoridinae et Cryptinae Gelini (1) (Hymenoptera). Nouv. Rev. Entomol. 4:283-293.
- Aubert, J. F. 1987. Deuxieme prelude a une revision des Ichneumonides Scolobatinae. Bull. Soc. Entomol. Mulhouse 1987:33-40.
- Avinent, L. and R. Jimenez. 1987. Opiinae from the collection of the Zoology Department in the University of Valencia I. Madrid, Palencia and Segovia, Spain. Bol. Asoc. Esp. Entomol. 11:121-134.
- Barron, J. R. 1987. Adults and larvae of two new species of Gelis (Hymenoptera: Ichneumonidae) parasitizing eggs of spiders Agelenopsis potteri (Araneae: Agelenidae) and Lycosa rabida (Araneae: Lycosidae). Ann. Entomol. Soc. Amer. 80:21-28.
- Belokobylskij, S. A. 1987. Palaearctic species of braconids of subfamily Doryctinae (Hymenoptera, Braconidae) described by C. Watanabe from Japan. In New Data on the Systematics of Far Eastern Insects, pp. 79-87.
- Belokobylskij, S. A. 1987. On status of the genus Dolopsidea Hincks (Hymenoptera, Braconidae, Doryctinae). In New Data on the Systematics of Far Eastern Insects, pp. 73-78.
- Berberet, R. C., L. J. Wilson and M. Odejar. 1987. Probabilities for encapsulation of eggs of Bathyplectes curculionis (Hymenoptera: Ichneumonidae) by larvae of Hypera postica (Coleoptera: Curculionidae) and resulting reduction in effective parasitism. Ann. Entomol. Soc. Amer. 80:483-485.
- Bordera, S., J. Selfa and R. Jimenez. 1987. Contribution to the knowledge of the genus Enicospilus Stephens (1835) (Hymenoptera: Ichneumonidae) in Spain. Bol. Asoc. Esp. Entomol. 11:221-234.
- Brajkovic, M. M. 1987. New species of the genus Orgilus (Braconidae: Hymenoptera) in Yugoslavia. Biosistematika 13:145-149.
- Burgess, E. P. J. 1987. Population dynamics of Mythima separata and its parasitoid, Cotesia ruficrus, on maize in New Zealand. N. Z. J. Agric. Res. 30:203-208.
- Campadelli, G. 1987. Galleria mellonella L. as a substitute host for insect parasites. Boll. Ist. Entomol. "G. Grandi" Univ. Bologna 42:47-56.
- Campadelli, G. and M. L. Dindo. 1987. Recent progress in rearing insect parasitoids on artificial media: an overview. Boll. Ist. Entomol. "G. Grandi" Univ. Bologna 42:101-118.

- Cave, R. D. and G. L. Miller. 1987. Notes on Anacharis melanoneura (Hymenoptera: Figitidae) and Charitopes mellicornis (Hymenoptera: Ichneumonidae) parasitizing Micromus posticus (Neuroptera: Hemerobiidae). Entomol. News 98:211-216.
- Celik, S. 1987. Quantitative essential amino acid requirements of Pimpla turionellae (L.) (Hymenoptera, Ichneumonidae). Doga. Kim. Serisi 11:89-99.
- Chang, W. Y., C. H. Chang and Z. T. Wang. 1987. Occurencs of Cotesia flavipes Cameron (Hym.: Braconidae) in autumn cane fields. Rept. Taiwan Sugar Res. Inst. 117:31-41.
- Chaudhary, R. N. and V. K. Sharma. 1987. Parasitization in diapausing larvae of Chilo partellus (Swinhoe) by Apanteles flavipes (Cameron). Indian J. Ecol. 14:155-157.
- Chernoguz, D. G. and S. Y. Resnik. 1987. Aetiological and physiological components of parasite-host specificity of the braconid Alysia manducator Panz. (Hymenoptera, Braconidae). Entomol. Obozr. 66:499-510.
- Chernoguz, D. C. and N. P. Vagina. 1987. Experimental investigation of the period of morphogenetic activity in relation to the host in the ontogenesis of the braconid Alysia manducator. Zool. Zhur. 66:1209-1213.
- Cossentine, J. E. and L. C. Lewis. 1987. Development of Macrocentrus grandii Goidanich within microsporidian-infected Ostrinia nubilalis (Hubner) host larvae. Can. J. Zool. 65:2532-2535.
- Dijkerman, H. J. 1987. Notes on the parasitisation behaviour and larval development of Campoplex rufinator and Diadegma armillata (Hymenoptera, Ichneumonidae), endoparasitoids of the genus Yponomeuta (Lepidoptera, Yponomeutidae). Proc. K. Ned. Akad. Wet. Ser C Biol. Med. Sci. 90:271-280.
- Dindo, M. L. 1987. Effects induced by parasitic Hymenoptera in their hosts. Boll. Ist. Entomol. "G. Grandi" Univ. Bologna 42:1-46.
- Donovan, B. J. and P. E. C. Reed. 1987. Attempted biological control of social wasps, Vespa spp. (Hymenoptera: Vespidae) with Sphecochaga vesparum (Curtis) (Hymenoptera: Ichneumonidae) in New Zealand. N. Z. J. Zool. 14:329-336.
- Dover, B. A., D. H. Davies, M. R. Strand, R. S. Gray, L. L. Keeley and S. B. Vinson. 1987. Ecdysteroid-titre reduction and developmental arrest of last-instar Heliothis virescens larvae by calyx fluid from the parasitoid Campoletis sonorensis. J. Ins. Physiol. 33:333-338.
- Feng, J. G., G. S. Shi, X. Tao, Y. Zhang and S. Y. Jiang. 1987. Biology of Macrocentrus linearis (Nees) and its use against asian corn borer, Ostrinia furnacalis. Chinese J. Biol. Contr. 3:102-105.
- Fischer, M. 1987. Hymenoptera, Opiinae III - Äthiopische, orientalische, australische und ozeanische region. Das Tierreich no. 104, 734 pp. Verlag W. de Gruyter, Berlin.
- Fischer, M. 1987. Zusammenfassung des subgenus Tolbia Cameron mit beschreibung einer neuen art von den Philippinen (Genus Opius Wesmael, Hym., Braconidae, Opiinae). Z. Arbeit. Öst. Entomol. 39:27-32.
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