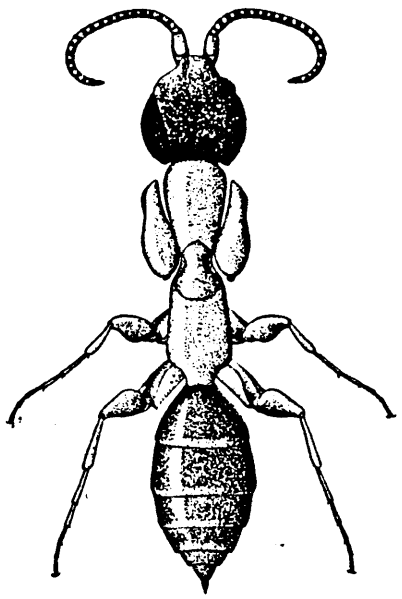
Folks

SPHECOS



A FORUM FOR ACULEATE WASP RESEARCHERS

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E. O. Wilson Says,

"One of my favorite journals is Sphecos, the insiders' newsletter notable for its exciting tales of field trips and research, gossip, feisty opinion, insouciance and above all, love of the subject, in this case wasps. Somehow it captures the aura surrounding entomology that drew me to the discipline in the first place and keeps me there. When the card-carriers gather they talk like Sphecos and not like Annals of the ESA or American Naturalist."

When your editor read this statement by one of the acknowledged "biggies" of science, it really made my day! Of course I get quite a few lauditory letters from the readership and they are appreciated, but Ed Wilson's comments really capture the essence of Sphecos.

The "aura" that Ed Wilson mentions is due largely to the steady input from you, the readers. I am somewhat amazed that Sphecos is still going strong as its tenth year approaches - lets all keep up the good work! Please keep sending in research progress, forum articles, trip reports (come on Pulawski, Carpenter, and others that have made big collecting trips the past couple of years - get off your duff and write!), and other material. We need to hear from some of the people that never send in anything. The more diversity the better. Many of you indicated on those questionnaires that you could or would send in articles on a variety of subjects (museum wasp collections was one common subject mentioned). I have to rely on you to send this material to me, because I can't possibly write letters to each of you requesting an article for the newletter. Its up to you. It only takes a few minutes in most cases to prepare a piece for Sphecos. Do it now.

In my opinion the FORUM and PET PEEVE departments offer the most interesting reading, but so far most material has been generated by those old reliables Archer, Carpenter, Snelling and Starr. How about some new faces? Surely many of you have things worth debating or discussing.

The wasp depicted on this issue's masthead is the sclerogibbid Sclerogibba vagabunda (Bridwell), a Hawaiian species (from Swezey, 1939, Proc. Hawaiian Ent. Soc. 10:261). The front legs were partially concealed and not shown in the drawing.

My apologies to Raymond Wahis. His articles in Sphecos 15 on "Pompilides de la Corse" and "De la variation des couleurs de base chez les Pompilidae Européens" contained many typographical errors that I did not notice before going to press. I would have reprinted them in this issue but we ended up with 40 pages of ms. and that is now the maximum size for an issue of Sphecos. The USDA duplicating office will only make a maximum of 25,000 xerox copies of pages. With a 50 page issue that makes only 500 copies and we now have nearly 600 people on the mailing list. So I have to keep issues to 40 pages.

This issue contains an interesting report by Colin Vardy on a collecting technique (page 17) that sounds great for capturing difficult subjects such as arboreal wasps. A newcomer to Sphecos, Don Cameron, a Greek and Latin scholar, has written two pieces included in this issue that have much wider application than just aculeate wasps. One (page 6) deals with the authorship of new names in Fourcroy's 1785 "Entomologia Parisiensis", the other (page 8) with species names ending in the suffixes -fer, -fera, -ferum. In the FORUM the boys are at it again - this time with that old war horse "subspecies". Finally Robin Edwards has provided another supplement to the literature of the Vespinae (page 29). I think that this issue has something for everyone.

Zoological Record is now essentially up-to-date thanks to computerization. Nevertheless I will maintain the "Recent Literature" section in Sphecos because it is still handy to have the wasp literature concentrated and at your fingertips. Besides many readers of Sphecos do not have ready access to ZR.

Research News

(see also p. 41)

Katsuji Tsuneki (Asahigaoka-Danchi 4-15, Mishima, Shizuoka Pref., Japan 411) has told me in a recent letter that his health is much improved and he is again doing research. Dr. Tsuneki also told me that issue 34 of the Special Publications of the Japan Hymenopterists Association has been published. In Sphecos 16:23 I announced the apparently premature cessation of this journal!

Hermann Dollfuss (Franz Hoeglgasse 4, A-3100 St. Poelten, Austria) writes "I have finished a key of Austrian Sphecidae and will now start a revision of the spheicd genus Pemphredon of the Holarctic region. I solicit loans of any Holarctic material of this genus. As I cooperate with the Museum of Natural History of Vienna, send specimens for me to Univ.-Doz. Dr. Max Fischer, 2. Zoolog. Abteilung, Naturhistorisches Museum Wien, Burgring 7, A-1014 Wien, Austria."

Allan Hook (St. Edward's University, Division of Physical and Biological Sciences, Austin, Texas 78704) reports "This spring at the Breckenridge Field Laboratory (BFL) on the Colorado River near Austin, Texas, I picked up my first Moniaecera sp? (can't see any tooth or spine, ventrally on the base of the mandible). Also, I found a Crossocerus nesting in a soft layer of a limestone bank; Trypoxylon is also nesting there. Eventually I plan to excavate some nests. Further, I reared a rhipiphorid beetle from a Cerceris fumipennis cocoon. I am aware only of Bembix serving as a host - does anyone know of any other sphecid records?

"I found Pison agile nesting at BFL. Nests and prey were a reported by Sheldon (1968). Last weekend (August) I collected a Cerceris irene female that had the head of a Lasioglossum attached to the base of her antennae. I've seen fire ants commonly attached in such fashion, but I believe I have not seen this before (although Cerceris do use bee nests).

"This spring, a large portion of BFL was treated with Logic. Presently, the fire ants are gone and ground nesting aculeates have reinvaded these areas! Other ants evidently survived this treatment (e.g. Pogonomyrmex)."

Bill Overal (Museu Paraense Emilio Goeldi, Caixa Postal 399, 66.000 Belém, Brasil) reports that "I have decided to get the Bothynostethus (Sphecidae) review out of the files and finished up."

Sean O'Donnell (College of Agricultural and Life Sciences, Department of Entomology, 237 Russell Laboratories, 1630 Linden Drive, Madison, Wisconsin 53706) writes, "I am a new graduate student under Dr. R. Jeanne at the Univ. of Wisconsin. I intend to work on Polybia occidentalis in Costa Rica, and will serve as Bob's research assistant in the field beginning in late August, 1988. My proposed thesis topic is the importance of variability in worker activity levels (elitism) to social insect colony function/caste formation."

Dick Bohart (Dept. of Entomology, Univ. of California, Davis, Calif. 95616) says, "Our chrysidid book has been accepted by Harvard press, pending an NSF publication grant proposal.

It looks like it will be at least a year before it comes out! In the meantime I have been writing papers on Pterocheilus, Maricopodynerus, and Euparagia, and they are tentatively complete. The paper on Microbembex of Argentina by Willink and me has been submitted to Philad. Acad. Sci. I suppose that will be a year, too. I spent quite a few hours on Belomicrus before temporarily laying them aside. Now I am concentrating on Solierella. F.X. Williams did a good job, considering! His key can certainly be improved, synonymy corrected, and several new species added. The inermis complex, which includes mexicana and probably lucida, as well as mirifica Pate and corizi Williams, is a real headache. It is either all one quite variable species or five or six different species. At present I lean toward the latter view. I have a good series from Costa Rica which is similar to mexicana but probably different.

Tom Piek (Farmacologisch laboratorium, Univ. of Amsterdam, Meibergdreef 15, 1105 AZ Amsterdam Zuidoost, Netherlands) writes, "In my paper in Ent. Ber. Amst. 47:96-98 (see Sphecos 16:28) I called attention to a toxinological argument in favour of the close relationship of Vespidae and Scoliidae. This argument is the presence of kinins in the venoms of these wasps. Recently Justin Schmidt and I studied ant venoms, in which we have also found kinin-like activity (Piek et al., Comp. Biochem. Physiol. 1988, in press). Currently we are preparing a paper on the toxinological argument in favour of the close relationship of Formicidae, Scoliidae and Vespidae. We may consider the presence of kinins to be equivalent to a synapomorphy.

Frank Parker (American Embassy, PSC Box 342, APO Miami, Florida 34020-3440) writes: "Collected 3 species of Pison so far and a few Liris. One Pison has apical color bands on the terga - rather different? Found a nest of Liris? under a leaf made from chewed plant fibers like an Anthidine bee - weird. Anyway, 2 males emerged so far. I'm sending everything to Logan [Bee Systematics Lab., Utah State Univ.] for safe keeping, labeling and storage. Yesterday I sent 10 full boxes - mostly aculeates plus lots of layered insects. Utah should have a great Costa Rica collection after my 6 years are up. I've sent them at least 20,000 insects so far. Have collected all kinds of neat wasps - many large Sphex at Monteverde one weekend, 3 species. Too many kinds to describe here. Great bees too."

Erik Tetens Nielsen (Sherwood Hammock Biol. Lab., 4598 South 25th St., Fort Pierce, Florida 24981) sent Karl Krombein this interesting letter in September, 1987: "Sometime ago my son-in-law, Frank D. S. Evans, happened to mention that he had seen a number of wasps flying around somewhere on the South Beach, and August 11, he took my daughter and me out there. On an old dike, shaded by mangrove and Australian pines there was an area of a couple of square meters with a beautiful colony of a large wasp; several nests were under construction. I tried to dig out a nest, but did not succeed; 84 years and a slight stroke this spring have made me a good deal less spry then when I last worked the colony of Bembex during the war. But it was such a mental lift to deal with the charming animals again that I decided to get out of it what I could.

"It was, however, not so easy. There are 14 miles out to the colony -- and I stopped driving last year. My daughter, Hedvig, would, of course, have been ideal to work with, as we have done so many times in the past, but she has her hands full of killing mosquitoes, and can only help me on Sundays. I have, however, succeeded in coming out to look after the wasps most days; once when all else failed, Dr. Lounibos from my old lab was so kind to let me borrow one of his assistants 3 half-days. But finally, Dr. Baker (present chief of my old lab) came back from vacation and with him came his 19 year old daughter, Desha. She is bright and charming and could (and would) help me the last two weeks before she returns to Chicago to the university. She did not know a thing about wasps when we started last Friday, but already after the first two days we got more done than during the previous two weeks. We have painted 12 individuals and six of them are under observation.

"I did not know which animals I was dealing with at first, but thought it was a Sphex; a visit to Archbold Station and a conversation with a very nice Dr. Deyrup, who identified the species as S. jamaicensis. Bohart & Menke (1963) has only one remark on the biology: Krombein & Evans, 1954; but there is nothing about jamaicensis unless Chlorion (Ammobia) ichneumoneum fulviventre is a synonym? [It is, ASM]

"What we have learned so far is, that the nest is provided with food, consisting of crickets (both males, females and young ones). A number of these are carried in immediately, but later on the nest is inspected and more food is carried in. At least in one case, we made a plaster cast of a nest in which a female cricket had been placed. While I tried to get the cricket out of the mould there appeared to my great surprise suddenly a large larva which devoured the cricket. Later it got one more cricket (we stole it from another wasp) after which it spun a cocoon.

"There have not been any males present in the colony during the time I have observed it, so I cannot expect it to last much longer than Desha is staying with me. We hope at least to learn more exactly about the type of provisioning and inspections; what Baerends called 'raupenlosen Besuch'.

"If you should know of anybody who knows more about my dear jamaicensis I would, of course, be happy to hear about it."

Colin R. Vardy (Dept. of Entomology, British Museum (Natural History), Cromwell Road, London SW7 5BD England) reports, "Just returned from one month in Argentina. A successful trip from study point of view. Working in 4 different institutions most of time, identified and recorded 1,300 Pepsis. Saw most of Brethes types in the genus (a few, mainly described from small private collections, are lost). Most of other days raining, so couldn't collect much. The country very depressed, e.g. inflation rate 12.5 per week. Teachers on strike for more pay. If they get it, it'll still be 2-3 months in arrears and the rise not back-dated."

Help Needed

Sean O'Donnell (Dept. of Entomology, Univ.of Wisconsin, Madison, WI 53706) needs information on variability in social insect worker (need not be wasps) activity levels, commonly called "elitism." He is studying this component of social insect caste and colony function in Polybia occidentalis, as a start, but may broaden his scope if necessary. Any suggestions of pertinent literature or sources of data would be greatly appreciated.

Guido Pagliano (Corso Corsica 6, 10134 Torino, Italy) writes that he is looking for a publication outlet for a checklist that he has compiled for all genera in the Hymenoptera. It includes subgenera, synonyms, and family and subfamily assignment. The list contains 15,000 names and is 220 pages. [How about Henry Townes at American Entomological Institute - ASM]

Raymond Wahis (Faculté des Sciences agronomiques de l'Etat, Zoologie genérale et Faunistique, B. 5800 GEMBLOUX - Belgium) writes, "I am currently studying the Pompilidae collected by C. van Achterberg (RNHLeiden) at Sulawezi in 1985 and by Michael C. Day (BMNH) at Seram in 1987. Though this material is rather limited, I found a lot of new species especially in the genera Hemipepsis, Auplopus and Irenangelus. I would be grateful to anyone who will loan me for study additional material from these areas."

New Addresses

Frank "Paco" Parker: PSC Box 342, APO Miami, Florida 34020-3440
Eduardas Budrys: Institute of Zoology and Parasitology, Lithuanian Academy of Sciences, MTP-1 Vilnius 232600, USSR.
Jay Rosenheim: Dept. of Entomology, University of Hawaii at Manoa, 3050 Maile Way Honolulu, Hawaii 96822
Christopher Starr: Dept. of Horticulture, Univ. of Georgia, Athens, Georgia 30602
Eric Eaton: 730 Riddle Road #102 N, Cincinnati, Ohio 45220
Franco Borgato: Delegation C.C.E.-Mauritanie, (by diplomatic pouch), 200 rue de la LOI, 1049 Bruxelles, Belgium
Allan Hook: St. Edward's University, Division of Physical and Biological Sciences, Austin, Texas 78704
Parker Gambino: Field Research Station, Hawaii Volcanoes National Park, Box 52, Hawaii, Hawaii 96718

Missing People

Mailings of Sphecos 16 to the following people were returned by the post office. Does anyone know what happened to them?

Norman Lin (of Brooklyn, N.Y.)
Donald Hunt (of Richmond, Calif.)
David C. Post (of Wooster, Ohio)

People in the News

Woj Pulawski's 1988 revision of North American Tachysphex (see "Current Literature") was the first place winner of the "Award of Distinction" bestowed this year by the American Association of Museums. See page 42 for a review.

Arnold Menke's 1988 revision of the New World Pison (see "Current Literature") was proclaimed by the Ashmead Club to contain the most outrageous species names of any paper published this year.

Translation

An English translation is now available of the 1978 Russian work "Keys to the Insects of the European part of the USSR." Specifically it is volume 3, Hymenoptera, part 2 which includes Chalcidoidea, Proctotrupoidea, Ceraphronoidea and Bethyloidea [=Chrysidoidea]. The chrysidoid section is contained on pages 1-38 and only covers families Bethylidae, Dryinidae and Embolemidae. For information on availability of this book contact Mr. Michael E. Thompson, Translation Liaison, Room 1402, National Agricultural Library, Beltsville, MD 20705 USA.

Notable New Book on the Sphecid Genus Philanthus

Howard Evans and Kevin O'Neill have just published a book titled "The natural history and behavior of North American beewolves" (available from Cornell University Press, 124 Roberts Place, Ithaca, NY 14850 - $23.50 softbound). This 278 page treatise on the genus Philanthus covers the North American species in detail, but the authors also review briefly the Eurasian species as well. The final chapter titled "Major features of nesting behavior, with a final look at beewolves" is perhaps the most significant in the book since it summarizes everything, and, among other things, touches upon the apparent adaptiveness of their behavior patterns and the significance of diversity in the genus. They conclude that few concordances can be found between structure and behavior. This book represents a huge investment of observation time in the field and is quite an achievement. Anyone interested in wasp behavior in particular, and in sphecid wasps in general, should get a copy.

International Society of Hymenopterists

Members of the society that attended the International Congress of Entomology at Vancouver in July got together for a meeting. Election results were announced: president - Paul Marsh, vice president - Zdenek Boucek, secretary - Jim Carpenter, and treasurer - Gary Gibson. The society now has nearly 400 members world wide. Officers terms will be for four years.

Plans for a society sponsored journal are rapidly being developed according to Jim Carpenter, chairman of the journal committee. A ballot to elect subject editors for the journal will be sent to the membership soon. The subject editors will be charged with finding an executive editor. Eventually the current 5 dollar annual membership fee will have to be raised to cover the cost of publishing the journal.

The Proceedings of the Hymenoptera Symposium, which were sponsored by the International Society of Hymenopterists, and took place at the International Congress, will be published.

New Newsletter for Ant Workers

Notes from Underground is the title of a new newsletter for myrmecologists edited by Norman Carlin, Stefan Cover and Mark Moffet, all of whom are located at the Museum of Comparative Zoology, Harvard University, Cambridge, Mass. 02138. The first issue was due out in Sept. 1988. For further information contact the editors. Notes from Underground fills a big void in the world of Hymenoptera newsletters. Now the only major group in the order without a newsletter is the Cynipoidea (are you reading this, Goran Nordlander?).

Nomenclature

CONSERVATION OF PHILANTHUS TRIANGULUM

A petition to conserve the sphecid wasp name Philanthus triangulum was recently published in the Bull. Zool. Nomencl. 45:34-35 by Woj Pulawski (see p. 39). If the name is not conserved, this common Old World bee predator would have to be called P. ruspatrix (L.)(see Sphecos 12:21). If you are concerned about saving the name triangulum NOW is the time to write to the Commission voicing your opinion. Letters should be addressed to the ICZN, c/o British Museum (Nat. Hist.) Cromwell Road, London SW7 5BD, England.

GEOFFROY IN FOURCROY, 1785

by
H. D. Cameron
(Professor of Greek & Latin, Dept. of Classical Studies,
Univ. of Michigan, Ann Arbor, Mich. 48109)

Entomologia Parisiensis by A. F. de Fourcroy, a work published in 1785, contains many new names. Taxonomists citing these names often attribute them to Fourcroy, but sometimes to E. L. Geoffroy. It is clear from Fourcroy's preface (on pages iii-v), however, that Geoffroy should get credit for all names. I have translated the Latin Preface into English. Brackets enclose my supplements and clarifications.

"Editor's Preface to the Entomological Reader"

"Twenty years ago the very distinguished Geoffroy published published an excellent work on insects, which those interested in natural history received with great favor [he refers to Histoire abrégée des insectes qui se trouvent aux environs de Paris, 1762]. For a long time many have felt the need for a Compendium of convenient size which could be carried into the field, including the nomenclature and the classification, but omitting the discussion of the biology,. Therefore the most illustrious author [Geoffroy] thought that it would not displease entomologists if a catalogue of the insects found in the vicinity of Paris were issued in a small format like the Botanicon Parisiensis. Distracted by the duties of a medical practice which is of the greatest benefit to his fellow citizens, he [Geoffroy] has not been able to complete the task which he had begun. Since I have been interested in entomology for a long time, and since I [have been able to] rely upon the assistance of the author [Geoffroy], I have made bold to present this catalogue to the public. I have scrupulously preserved the classification of the most illustrious Geoffroy, his genera, his species and his descriptions. ***Geoffroy himself added the specific names***, mostly those of Linnaeus, which he had omitted in his large work. At the same time ***he*** [Geoffroy] ***took the occasion to correct certain things in his classification and to add many more.*** Thus the genus Eulophus is omitted after the Tenthredines, since, after careful study, Eulophus turns out to be nothing but a true Cynips with ramose antennae. Consequently, this insect now marches among the Cynipes. Furthermore,

many new species of insects have been found in the Paris area in the last twenty years, which are placed in their proper genera. But in order that these new species, numbering more than 250, might be distinguished from those [already] described in the quarto edition of the Histoire abregée des insectes, I have seen to it that each of them is marked with an asterisk. I have added the measurements and habitat of the species. Therefore, as far as the number of species and the nomenclature is concerned, this catalogue is much expanded and improved over the large quarto edition, and *I acknowledge that this enhancement is due entirely to the most celebrated Geoffroy. I have only added or changed certain unimportant things which I judge superfluous to mention here. I therefore have only assumed the duty of a simple editor*, led more by the hope of being useful than the hope of fame."

"Paris April 1785."

There is no doubt of any kind that the names in Fourcroy should all be credited to Geoffroy. Fourcroy declares as much in no uncertain terms. My translation I hope makes clear that the course of the argument in the preface makes no other conclusion possible, but I will specify two points of the grammatical evidence, to convince any doubters. First autor (Fourcroy's spelling for normal auctor) refers clearly to Geoffroy at the bottom of the first page of the preface, and this argues that the autor of line 4 of the next page likewise means Geoffroy. Second, the clincher is that Fourcroy uses the first person of the verb for himself (religiose servavi) but uses the third person for Geoffroy (addidit, neglexerat). If Fourcroy were to say that he himself had added the species names, he would have had to say ipse addidi. Third, Fourcroy says explicitly on the third page of the preface (lines 7-8) that the augmentation in the number of species and the nomenclature is due entirely (omnino) to Geoffroy. It is an open and shut case; the names are Geoffroy's.

I admit that there is some small room for argument about who is responsible for the species marked with an asterisk, but the plain implication of the text is that Geoffroy wrote the description and supplied the names for the additional species. My arguments are as follows:

1. Fourcroy says Geoffroy "took the occasion to correct certain things in his classification and to add many more".
2. This sentence has two explanatory followup sentences, the first of which gives an example of correction (Cynips), and the second of which discusses additional species. The plain implication is that these new species are Geoffroy's additions.
3. Fourcroy explicitly states that he added the measurements and the habitat. To what did he add them? The plain implication is that he added them to Geoffroy's descriptions.
4. Fourcroy states explicitly that all of the substantial additions are due to Geoffroy. Anyone who wishes to claim that this is only modesty and that Fourcroy actually wrote the descriptions himself, must discredit the plain assertion of the text.

Therefore, if one wishes to argue that the species marked with an asterisk should be attributed to Fourcroy, he must appeal to some other evidence than the preface to Fourcroy's book.

Followup by A. S. Menke

H. Hagen in his Bibliotheca Entomologica, 1862, p. 246 indicates that Geoffroy should get credit for all new names in Fourcroy.

There is a different kind of problem with Fourcroy - it is not consistantly binomial, and under Article 11 (c) of the Code, the names in the work are not available. At one time I. M. Kerzhner, a hemipterist at Leningrad, was going to seek clarification from the International Commission on Zoological Nomenclature as to the status of names in Fourcroy. This is important because some generic names from the book are currently recognized (for example, Diplolepis Geoffroy, a cynipid). I do not know if Dr. Kerzhner actually followed through with his proposed action or not.

SPHECOS 17:8 - 1988

-FER VERSUS -FERUS

(thoughts on the problem of spinifer and other Latin adjectives ending in -fer)

by
H. Don Cameron
(Professor of Greek & Latin, Dept. of Classical Studies, and
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The first question is what does "latinize" mean. We find it first in Art. 11.b.i of the Code, which specifies that a name may be either Latin or latinized. The 1964 edition of the Code required that the name must be a Latin or Latinized word, but the 1985 Code appears no longer to require zoological nomenclature to be in Latin. The reason for the change is to accomodate such names as Pfrille and ziqzaq, but in so doing the language of the Code has been rendered less precise and clear. Yet the language of Art. 11.b.iii, "so constructed that it can be used as a word and deemed to be Latin," and further on in subsection vi, "A name, if not Latin, may be latinized by being given a Latin termination," both seem to indicate, in the absence of clear and unambiguous language, that the intent is to preserve the universally accepted principle, dating from the Strickland Report of 1842, the grandfather of all subsequent Codes, that zoological nomenclature should be Latin[1]. The reason for introducing the word "latinize" is, of course, that many names from the time of Linnaeus to the present are not Latin but Greek in Latin clothing. From Roman antiquity there have been standard conventions for turning a Greek word into Latin form by transliteration coupled with a grammatical transformation giving the word a Latin grammatical shape rather than a Greek one. As these conventions came to be less and less generally understood by zoologists, the successive editions of the Code specified with more and more detail the rules for doing so. As modern zoologists began to use Algonkian or Maori for their names, the custom was extended to the latinization of exotic words as well.

This usage of the Code is confirmed by Art. 29.b.iii on forming family group names, titled "Determination of stem in names of type genera," which says, "If the name of a [type] genus is or ends in a Greek word latinized with a change in termination, the stem is that appropriate for the latinized form." The example given (Leptocerus) is formed from the Greek noun κέρας 'horn' whose genitive case is κέρατος and whose stem is consequently κέρατ- . The corresponding compounding form of this noun, which will supply the second element of compound adjectives is -κέρως genitive -κέρωτος(1985 Code, Appendix D, VII, Table 2, part B, no. 7). In high class Latin these Greek borrowings usually kept their Greek grammatical stem, hence Latin rhinocerôs, genitive rhinocerôtos (compare Pliny Natural History 8.71; 18.2). But occasionally they will take a Latin stem. For instance, βουκέρως 'cowhorned' becomes Latin bucerus, -a, -um a straight first-second declension three-ending adjective (compare Lucretius De Rerum Natura 5.866). A family name built on the Latin stem would be *Buceridae rather than *Bucerotidae, which is built on the Greek stem. There are many examples given in Art. 30 of the 1985 Code (Cf. Appendix B, 6, p. 189).

The Strickland Report of 1842, in section 14 (p. 114-5) titled "Latin orthography to be adhered to," establishes unambiguously the meaning of "latinize." "On the subject of orthography it is necessary to lay down one proposition, -- §14. In writing zoological names the rules of Latin orthography must be adhered to. In Latinizing Greek words there are certain rules of orthography known to classical scholars which must never be departed from." There follow several examples, and the principle is extended to modern European languages with several illustrative examples, and then to exotic languages or "words of barbarous origin," which should be "rendered as classical in appearance as is consistent with the preservation of their original sound."

Hence it is clear that the word "latinize" applies to non-Latin words brought into Latin and given Latin grammatical form. Art. 32.c.ii specifies that if the original author incorrectly ap-

1. H. E. Strickland, "Rules for Zoological Nomenclature. Report of the 12th meeting of British Association held at Manchester in 1842." British Association for the Advancement of Science Rept. 1842:105-121. The intention was clear that zoological names should be good Latin. "In proposing a measure for the establishment of a permanent and universal zoological nomenclature, it must be premised that we refer solely to the Latin or systematic language of zoology" [ibid. p. 108]. And ... "Let us then endeavour to render perfect the Latin or Linnaean method of nomenclature." And ... "By adhering to sound principles of philology, we may avoid errors in the future ... and the language of science will thus eventually assume an aspect of more classic purity." " ... the binomial system of nomenclature, or that which indicates species by means of two Latin words." [ibid. p. 109].

plied the rules for transferring a Greek (or Algonkian) word into Latin orthography his Latin word -- providing it has Latin form -- is valid. It does not mean he is permitted to be ungrammatical. Art. 11.b.vi and g make it abundantly clear that the name is to conform to the rules of Latin grammar, and the whole tradition of zoological nomenclature rests on this premise.

Now spinifer -a -um is already a Latin word. It cannot be "latinized." It is Latin to begin with. The Code never uses "latinize" to refer to the correction (or supposed correction) of grammatical errors with Latin. Hence the ungrammatical spiniferus is in no way protected by the exceptions listed in Art. 32.c.ii.

Articles 30 and 34.b make clear that endings of specific names must have correct Latin gender form, and such changes as are necessary are to be made automatically. Spiniferus is not the masculine form of a Latin adjective; it therefore apparently contravenes a mandatory provision of Art. 30 and 31.b, and by Art. 34.b it requires a manditory spelling change.

But there is a complication. There are 197 genuine Latin adjectives in -fer, yet 4 of them and only 4 of them, have alternative forms in -ferus as well. Those are either textually doubtful or are found in ecclesiastical or medieval authors. The four are vulniferus, infructiferus, mortiferus and pestiferus. Arguably, since the Code permits "ancient, medieval, and modern Latin" (Art. 11.b.iv), these four adjectives, and these four alone, might be permitted, and others might be permitted on the plea that they are "modern Lat," even though they bruise the grammatical soul of the purist.

The upshot is that in the interests of stability the form chosen by the original describer ought be be maintained, whether -fer or -ferus, since there is no good reason in the Code or in Latin grammar (if we include medieval and "modern") for changing the one to the other (Preamble, Art. 23.b and 79.a).

MORE ON -FER VS. -FERUS

by
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I read with pleasure Professor Cameron's comments on -fer, -fera, -ferum. I think that the following should be considered. Art. 26 says "if the spelling of a scientific name ... is the same as a Greek or Latin word, that name ... is to be treated as that word ..." Now spiniferus is not the same spelling, thus it cannot be regarded as Latin (at most as barbaric Latin), regardless of what the original author thought about it. Clearly, -ferus is not an incorrect original spelling in the meaning of the Code, and has not to be automatically corrected under the provisions of Art. 32.d.

Forum

THE SUBSPECIES PROBLEM AS APPLIED TO VESPA (HYMENOPTERA: VESPIDAE)

by
Michael E. Archer
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During my studies on the hornets, Vespa, I have found many colour-forms which have usually been given subspecies status. In the literature at present perhaps some 22 species are recognised with at least an additional 64 colour-forms or subspecies. Discussing these observations with friends during my visits to the Natural History Museum in London I have been referred to the paper by Wilson and Brown (Syst. Zool. 2:99-111, 1953) where it is considered that the subspecies category should not be employed, it being replaced by a brief statement of locality or range of distribution, i.e. the subspecies nomenclature should be dropped. In answer to the B.M. critics, usually Mick Day but also Colin Vardy, I usually reply by considering the subspecies as an early stage in the speciation process and as such requiring taxonomic recognition. The speciation process to which I am referring is that of the allopatric or geographical speciation, the new species either coming from a large population of the parent population, or from a small population which is often on the periphery of the parent species. Bush (Ann. Rev. Ecol. Syst. 6:339-364, 1975) refers to these speciation processes as speciation by subdivision and by founder effect.

My concept of the subspecies is perhaps rather grand and is probably not correct for

according to Mayr the subspecies is not primarily a unit of speciation except where it happens to coincide with a geographical or other genetic isolate. In brief Mayr would define a subspecies as a sub-population of a species which is distinctive phenotypically and inhabiting a geographical subdivision of the range of the species although the allopatric part of the definition may need further elaboration for some migratory, parasite and parasitoid species.

Some of the species of Vespa are widespread with distinctive geographical colour-forms, and some of the island colour-forms could easily be genetically isolated. However other widespread species such as V. basalis Smith and V. mocsaryana du Buysson, which do not show geographical colour-forms, have not been divided into subspecies. However recently from Indo-China I have found a colour-form of V. mocsaryana rather different from the norm and no doubt sooner or later someone will describe it as a new subspecies. Some of the subspecies of particular species cannot be separated phenotypically without knowledge of their geographical location. Thus the colour-form of V. affinis (Linn.) that is found in northern New Guinea falls within the colour range of the colour-form distributed from northern India to China. Similarly the melanic forms of V. tropica (Linn.) that are found on Buru island, South Moluccas and the southern Philippine islands cannot be phenotypically separated. Clearly the concept of the polytopic subspecies has been rejected for these examples because it is assumed that the similar colour-forms have arisen independently of each other. However perhaps the polytopic subspecies concept should be applied as it is unlikely these similar colour-forms are potentially incapable of interbreeding. Clearly there is much room for confusion so perhaps it would be easier to follow Wilson and Brown and dispense with the nomenclature of the subspecies. Of course some of the subspecies, particularly those isolated in islands, could have already reached species status. To try and sort out the above confusing ideas I thought I would look at the widespread species of V. tropica which has many colour-forms, some of which are isolated on the islands.

Bequaert (Treubia 15:329-351, 1936) described 11 colour-forms of V. tropica giving each a subspecies status. Van der Vecht (Zool. Verh. Rijksmus. Nat. Hist. Leiden 34:1-83, 1957) added four further subspecies and Kojima & Reyes (Kontyû 52:260-261, 1984) one subspecies, so that with the nominate subspecies 16 subspecies have been described for V. tropica. Kojima (Kontyû 50:434-444, 1982) found that one subspecies, called V. t. philippinensis de Saussure, should be raised to specific rank, and gave a pronotal morphological character for separating the females. I have found a morphological character for separating the males. The eyes broadly touch the clypeus on males of V. philippinensis but are clearly separated on males of V. tropica. While mapping the distributions of the remaining 15 subspecies I found that some subspecies were partly sympatric although each subspecies within such an overlap area retained its distinctive colour-form indicating specific rather than subspecific status. Thus the subspecies pseudosoror v.d.Vecht overlaps haemetodes Bequaert and leefmansi v.d.Vecht while ducalis Smith, F. overlaps haemetodes. Consideration of this overlap information indicates that the 15 subspecies are really two species: V. tropica and V. ducalis. Incidently mapping of the other species of Vespa has also revealed further sympatric subspecies that remain phenotypically distinctive: thus V. velutina Lepeletier should lose V. auraria Smith (with pruthii v.d.Vecht) and V. mandarinia Smith, V. soror du Buysson.

V. ducalis with its nominate subspecies consists of five colour subspecies which, however, are very similar to each other. Even the island colour-forms are not really distinct. Thus the darker Japanese colour-form is also found in Korea and the Taiwan colour-form also occurs in Hainan island, southern China and Vietnam. Thus it is relatively easy to drop the usage of a further four subspecies.

This leaves V. tropica which, with the nominate subspecies, includes ten subspecies. Two colour-forms distributed from Sulawesi, Flores and Sumba to New Britain are called trimeres v.d.Vecht and trisignata Pérez. But trisignata is found in the widely separated areas of the island of Ceram and south-eastern New Guniea. Clearly here the more widespread trimeres has given rise to the polytopic trisignata in at least two geographical locations. I find the polytopic subspecies unacceptable as it brings together populations with different evolutionary histories. However since trimeres and trisignata are found in the same geographical area, the two subspecies can be combined into one subspecies to solve the problem. Three melanic forms of V. tropica are found in the northern Philippine islands (deusta Lepeletier), the southern Philippine and Palawan islands (anthracina Bequaert) and the isolated Buru island (unicolor Smith, F.). The colour-forms unicolor and anthracina can only be separated by knowledge of geographical location so should not be given separate subspecies names, but if combined a

polytopic subspecies would be created which I find unacceptable. Since I cannot combine unicolor and anthracina into a single geographical subspecies I am in a dilemma. What can I do now but drop the subspecies concept and become a follower of Wilson and Brown.

If I followed Wilson and Brown I could describe the colour-forms of V. tropica as follows. The Indian and south Chinese colour-form (= Indian colour-form) is characterised by reddish-brown markings on the head and thorax and only the second gastral tergite is orange. The reddish markings on the head and thorax become black in the colour-form found in Indo-China, Malaya, Sumatra and Borneo (=Malayan colour-form) although the Indian and Malayan colour-forms have a wide area of overlap with intermediate colour-forms from Sikkim to Thailand. On the Malayan colour-form the orange of the second gastral tergite sometimes extends onto the third gastral tergite while on the colour-forms from the Andaman and Nicobar islands (=Andaman colour-form) all the gastral tergites are orange except for the first. The Java and Bali colour-forms (Javan colour-form) is darker than the Malayan colour-form particularly on the second gastral sternite. The colour-form from Sulawesi, Flores and Sumba to New Britain (=Sulawezi-New Guinea colour-form) has the orange of the second gastral tergite extending onto the first tergite to a varying extent. Melanic colour-forms are found on the north Philippine islands (=north Philippine colour-form), south Philippine and Palawan islands (=south Philippine colour-form) and the island of Buru (=Buru colour-form). Among the Philippine islands the colour-form on Cebu (=Cebu colour-form) is reddish-brown rather than melanic.

I would invite comment on the subspecies problem and my attempt to solve it for the species of V. philippinensis, V. tropica and V. ducalis.

CONCERNING THE QUESTION OF SUBSPECIES IN VESPA

by
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It seems to me that Archer's treatment of Vespa is on the right track because many of the subspecific names are not useful even for purely taxonomic purposes, let alone phylogenetic implications. For example, I have found that assignment of the subspecific names (of V. tropica) trimeres and trisignata becomes almost arbitrary, even taking into account the localities, because of trivial or inconsistent differences among the specimens. On the other hand, the glaring differences between the dark (V. tropica) and the light (V. ducalis) forms cannot be ignored, especially taking into account the sympatries.

One problem in dealing with species in the Oriental region is, of course, the difficulty in obtaining large series with detailed collection data from many different stations within the region. Thus, it becomes practically impossible to know whether a suspected sympatry (judging from the given data) really involves species separated by considerable distance within the given political unit, or whether there is, for example, a distinct elevational difference on the same mountain range. Thus, my own observations have led me to believe that there is a sympatry but I could not be certain for the reasons I just gave. The differences within V. ducalis are trivial, as Archer mentions. V. tropica (sensu Archer) include a much greater phenotypic and geographic range, but even here the differences are restricted to the degree of development of the orange gastral bands. (I find it slightly amusing that even a dark color form such as V. tropica anthracina sometimes has rudimentary orange bands on the second tergite, as if to serve as a token of its relationship to the more xanthic forms.) Even if mention of a given locality causes one to have an accurate mental picture of the coloration of a species as represented there, is this sufficient reason to assign a trinomen to that locality? The study of Vespa tropica suggests that it isn't, especially when such differences become blurred in some parts of the range, and may become more so as more specimens are collected, especially from areas that are relatively remote. Indeed, Archer has referred to a few of these.

Concerning V. philippinensis, I only have been able to compare males of this species with those of V. tropica leefmansi (if I may be permitted to use this name while it is still in the books!). I see the morphological distinction here but cannot say whether it holds for V. tropica throughout its range. If it does, then I agree that V. philippinensis is a valid species.

I also have concluded that Vespa mandarinia and V. soror are distinct species. The latter appears to be sympatric with the former in at least two areas: in Laos with what is called V.

mandarinia magnifica and in Foochow, China with what is recognized as the nominate subspecies of V. mandarinia. V. soror has a proportionately thinner gena and a longer forewing length than V. mandarinia. Although the coloration of V. soror is similar to that of V. ducalis, these can be separated morphologically by the shape of the clypeus. I believe that some of the recognized subspecies (if not all) of V. mandarinia can be eliminated, and this could be done at least for some of those of V. analis (perhaps all if V. analis proves to be only one species). It is probably safe to say that V. affinis will merit the same treatment as V. tropica with the exeception that there are no parallels to V. philippinensis or V. ducalis, thus allowing all of V. affinis to be reduced to one taxon.

At this time I regret that I have no comment concerning whether V. auraria should be distinct from V. velutina.

Given the developments that are taking place in the study of the imported fire ants (Solenopsis invicta and richteri), biochemical methods of systematics should be useful in resolving some of the questions with Vespa. One goal should be to develop a technique for study of specimens that have been dried for a long time (e.g., removal of a small piece of cuticle for analysis).

SUBSPECIES IN VESPA

by
James M. Carpenter
(Museum of Comparitive Zoology, Harvard University, Cambridge, Mass.)

Archer's approach to subspecies in Vespa seems useful, especially to the extent that subspecific taxa are eliminated. As he notes, Mayr has emphasized the failure of the concept of subspecies as species in statu nascendi, and in modern evolutionary biology it is the local population which is viewed as the evolving unit. Even the concept of subspecies as a geographical race is therefore equivocal, as the subspecies of a polytypic species are not all necessarily comparable as lineages. Archer discusses some practical problems in application of the geographical race concept, namely the same diagnostic character arising in different parts of the species range. This is because these subspecies are based entirely on color differences, which in vespids are ecological correlates. MacLean et al. (1978, Great Lakes Ent. 11:105-116) have even shown experimentally that such "subspecies" in Polistes can be produced by manipulation of humidity! Under such circumstances it is better to dispense with subspecies entirely, and I would argue that taxonomy is better off without them generally. [I wholeheartedly agree with you on this point Jim - ASM]

SUBSPECIES

by
The Mud D'aub

The use of subspecies is akin to putting postage stamps into albums that have rectangles for each issue - taxonomists love to do the same thing with color variation via the description of subspecies. But the objects of our affection are not fixed in stone; color usually always varies clinally over the range of a species, sometimes in ways that mystify and defy compartmentalization. In spite of this, many taxonomists continue to describe more subspecies. Incredibly, one can still find present day "scientists" describing subspecies that are sympatric! How can this be? Well I think it simply goes back to my opening statement. People just need to have names on everything that is "different". This is a disservice to science. It is far better to simply describe the color variation in terms of populational differences without applying formal names. Fortunately, many current taxonomists are doing just that. In my opinion, about the only color forms that may warrant recognition as subspecies are island populations because they are truly allopatric - but even so they should be recognized judiciously.

BROTHER'S 1975 ACULEATE PHYLOGENY

by
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When talking at meetings and corresponding with aculeatists I hear a lot of low level grumblings about Brothers (1975) monograph "Phylogeny and classification of the aculeate

Hymenoptera, with special reference to the Mutillidae", Univ. of Kansas Science Bull. 50:483-648. Now, we must all admit that Brothers makes some pretty important changes in the traditional scheme of the relationships among the higher taxa in the Aculeata and that his contribution is important. Rather than just grumblings, I would like solid opinions about the validity of Brother's phylogeny. Is it generally accepted, and if not, why? Ok, all of you out there, how about some opinions.

My second problem is what to do with the Scoliidae. Brothers splits the traditional gross lumping within the Scolioidea into numerous parts and places them throughout the Aculeata. In particular, his Scoliidae is the sister group for the Vespidae. Is this now the general consensus about its placement; or is there still reason to place it much lower (or elsewhere) in the dendogram?

MORE ON TRIBES IN THE POLISTINAE

by
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Junichi Kojima & Jim Carpenter (Sphecos 16:6-7) show that classification within the Polistinae is unstable and inconsistent, with "Polybiini" as their main example, and maintain that we should "throw out the tribes as rubbish". I agree entirely and would like to extend the point.

Present phylogenetic knowledge shows four useful genus-groups within the Polistinae: Polistes, Mischocyttarus, the strictly Old World genera (Ropalidia and three others) and the New World swarm-founding genera (Polybia and about 17 others). By "useful" I mean that each is: a) apparently holophyletic, and b) behaviorally and ecologically unified enough that we will often want to talk about it as a unit. The enterprise of classification, insofar as it accomplishes anything, consists of giving names to just such units. Very well, then, let's name them.

The first two already have neat, accepted names, so it's really just a question of what to call "Ropalidia and associated genera" and "Polybia and associated genera". It would be perfectly orderly to designate each of the four as a tribe, but why introduce a new level of formal nomenclature just to give names to two genus-groups? My preferred solution is to refer informally to the "ropalidiine wasps" and "polybiine wasps" (But Chris, these two adjectival names are based on tribal names. There is nothing inherently wrong with using tribes in a classification. In your example it appears that there are four - why not use them? - ASM).

I'll give another example of this sort of thing. Carpenter (1982) treated what we had been calling the "Vespoidea" as a single family, Vespidae. In my view, Carpenter's classification is better than the old one, but it introduced just one problem. We often want to talk about the Vespinae + Polistinae + Stenogastrinae as a unit. Most of us had called this holophyletic group of three subfamilies the "Vespidae", but in Carpenter's classification it had no name. My preferred solution is again an informal name, the "social wasps", in the strict sense of all members of these subfamilies and no others. It should not be problematical that there are at least two eusocial sphecids and probably a very few stenogastrines are solitary, as long as "social wasps" is understood as a name, rather than a description. Similarly, we might use "land vertebrates" (or "quadrupeds") to mean exactly all amphibians + amniotes, even though many of these are aquatic (or legless) and a few fish are mainly terrestrial (or sort of have legs).

Scientific Notes

PREY OF SCAPHEUTES BRASILIENSIS HANDLIRSCH (SPHECIDAE)

by
Martin Cooper
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I caught a female of this species straddling its prey, a tettigoniid nymph (1.0 cm long in body length), on a path through a clearing in woodland in a Colombian locality (Putumayo, Villa Garzon, 500m. 24-XII-1987). The only other prey record for the Scapheutini is also an orthopteran, an acridid nymph carried by Bohartella scapheutoides Menke (Vardy, 1987, Three new taxa of Neotropical Larrinae (Hym., Sphecidae) and a new prey record. Ent. Mon. Mag. 123:99-106.)

ANOTHER CASE OF INTER-SPECIFIC USURPATION IN DOLICHOVESPULA

by
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Robin Edwards (in Sphecos No. 5, 5th February 1982) reported an incident in which a Dolichovespula sylvestris nest had been taken over by a D. norwegica queen. Unfortunately he only discovered this when, some weeks after obeserving the sylvestris queen and her first workers, he found that the nest was occupied by norwegica workers. On 27th April 1987 two D. sylvestris queens adopted some specially desiqned 'wasp boxes' in my garden. On 17th May I discovered a norwegica queen in residence at one of the nests, with the dead sylvestris foundress lying on the floor of the box. At this nest the first sylvestris worker emerged on 23rd May and the first norwegica worker on 17th June. Males and queens of norwegica began to appear during the forst week of July.

Events at the nest were abnormal. From the appearance of the first sylvestris workers, eggs, larvae and pupae were ejected from the nest, and once a queen-sized larva; also the appearance of the first norwegica workers was delayed for about a week beyond the date one would expect from the known development period, indicating that several must have been killed in their early stages. This was adequately supported by many of the survivors being crippled, with injuries ranging from damaged legs to damage to one or both wings, some having had both wings completely chewed off. Additionally, after the emergence of the norwegica workers, callow sylvestris males (obviously produced by the sylvestris workers) were thrown out. Clearly there was aggression between the sylvestris workers towards the norwegica, though observation showed that this was not directed towards fully adult workers. The nest, though successful in producing sone norwegica sexuals, was well below average size. Although outnumbered, some sylvestris workers survived throughout the colony's history and continued to depress the number of fully functional norwegica workers. A good photographic record of the nest and its inhabitants was obtained, many transparencies showing the two species side by side on the envelope.

EUMENINE WASPS OF BRACKENRIDGE FIELD LABORATORY

compiled by
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determinations by
James M. Carpenter
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Presently, 13 genera encompassing 34 eumenine species are recorded from BFL, of these, 8 species are unknown biologically. The vast majority of these wasps were hand netted, although a few have been reared from Polistes nests. It is likely additional species well be discovered at BFL, as these records are based upon about two years of collecting.

Eumenine species list

1. Dolichodynerus tanynotus (Cameron)
2. Stenodynerus anormis (Say)
3. Stenodynerus histrionalis (Robertson)
4. Stenodynerus microstictus (Viereck)
5. Stenodynerus propinquus (Sassure)
6. Parancistrocerus fulvipes (Saussure)
7. Parancistrocerus minimofer (Bohart)
8. Parancistrocerus pedestris (Saussure)
9. Parancistrocerus perennis (Saussure)
10. Parancistrocerus rectangulis (Viereck)
11. Parancistrocerus vagus vagus (Saussure)
12. Euodynerus annulatus (Say)

13. Euodynerus barberi (Bohart)
14. Euodynerus boscii (Lepeletier)
15. Euodynerus castigatus (Saussure)
16. Euodynerus crypticus (Say)
17. Euodynerus foraminatus (Saussure)
18. Euodynerus hidalgo (Saussure)
19. Euodynerus megaera (Lepeletier)
20. Monobia quadridens (Linnaeus)
21. Pachodynerus nasidens (Latreille)
22. Pachodynerus praecox (Saussure)
23. Pachodynerus quadrisectus (Say)
24. Paranortonia symmorphus (Saussure)
25. Ancistrocerus adiabatus (Saussure)
26. Ancistrocerus campestris (Saussure)
27. Ancistrocerus catskill (Saussure)
28. Ancistrocerus spinolae (Saussure)
29. Ancistrocerus unifasciatus (Saussure)
30. Symmorphus canadensis (Saussure)
31. Eumenes fraternus Say
32. Eumenes smithii Saussure
33. Zethus spinipes Say
34. Leptochilus bellulus (Cresson)

Collection News

TSUNEKI HYMENOPTERA COLLECTION TO SMITHSONIAN

by

Beth Norden, Karl Krombein & Arnold Menke

The National Museum of Natural History (USNM) recently acquired over 45,000 specimens of wasps and bees from the outstanding personal collection of Dr. Katsuji Tsuneki of Mishima, Japan. For over 40 years, Dr. Tsuneki has been a leading taxonomist on Aculeata in the Oriental and eastern Palearctic Regions, and has been a prodigious producer of papers on wasps and bees. He amassed extensive material from Japan, from China and Korea during his military service in the late 1930's, and from Taiwan during two trips of six months in the mid 1960's. Dr. Tsuneki retired from active work for a period of time due to illness, but in a letter to Menke received in September he indicates that his health is much better and he is again actively doing research - good news!.

During the 1950's, a letter to Dr. Karl Krombein initiated a professional acquaintance that over the years grew into a deep friendship. This permitted Dr. Krombein during a visit to Japan in 1972 to discuss the possibility of depositing the Tsuneki Collection in the Smithsonian Institution. In 1985 Dr. Tsuneki made a donation of 38,322 wasps and bees (including 42 holotypes and numerous paratypes) from Japan, China, Korea, Mongolia, and the Philippines. Then in 1987 the Smithsonian purchased his Taiwanese collection of 6,785 specimens which included 122 holotypes and 893 paratypes.

The Sphecidae make up the bulk of the Tsuneki material and it is especially rich in Pemphredoninae and Crabroninae. The material is currently being incorporated into the sphecid collection which has been greatly augmented by this fine addition. We did not receive all of Dr. Tsuneki's holotypes; he kept the bulk of the Japanese types for deposit at some institution in his country. We are particularly grateful to Dr. Tsuneki for placing his valuable collection in the Smithsonian, where it will be available for study by aculeate systematists now and in the future.

Techniques

PAINT PENS: A BETTER WAY OF MARKING WASPS

by
Robert L. Jeanne
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Many of us who find it necessary to mark wasps for individual recognition in the course of behavioral studies have been in the habit of using model airplane dope for color coding. If your experience has been similar to mine when it comes to using this stuff, you know that messing with those little bottles leaves much to be desired. When the paints are fresh, all goes well. Inevitably, however, the paints begin to thicken with repeated openings of the bottles. Paint that is too thick does not adhere adequately to the insect surface; when dry, the slightly domed dots readily flake off the cuticle, leaving you with no evidence of who's who. Thinning the paint provides a remedy, if not overdone, but paint that is too thin flows over the cuticular surface, often running into wing or leg joints, where it restricts locomotion after it dries. Even if one is able to persist through thick and thin, it is almost impossible to avoid the eventual snafu of the screwcap getting hopelessly fouled with dried and semi-dried paint.

Abandon all your Testor's bottles, ye who color mark wasps! There is now a new product available that drastically reduces all these problems. They are known generically as "paint pens." Yosiaki Ito (Laboratory of Applied Entomology and Nematology, Nagoya University, Chikusa-ku, Nagoya 464, Japan) first introduced me to them last year when he and I were both in Townsville (Qld.), Australia. He graciously left me a set when he left and I've been hooked ever since. His were called "Opaque Color" (the rest of the label is in Japanese). I subsequently found a brand called "Texta" available through an art supply store in Townsville. Here in Madison, at the University Bookstore (pen department, not art department), they are called "Decocolor" and are made (imported?) by Uchida of America (Garden City, NY and Compton, CA). The price at the latter outlet is $2.39 each. Despite being available under different brand names, all are morphologically identical and all are made in Japan, probably by the same company. They come in fine and broad tips. I find the fine tip best for marking social wasps.

The pens are 11 mm in diameter and 130 mm long. The paint is contained in an aluminum barrel and feeds into a hard but porous spring-loaded tip. You start the paint flowing in a new pen by shaking it vigorously up and down a few times. Then remove the cap and press the point repeatedly against a clean substrate, causing the tip to retract, until the paint flows to the tip. Each new use usually requires only a few pushes on the tip to get fresh paint flowing. With practice I found I could use these pens to apply very small spots of paint just where I wanted them, even on very small (8 mm) wasps. Occasionally a bit too much paint reaches the tip. A few light touches to a scrap of paper blots this away and you're ready to go.

The colors are opaque, and appear in every way to have the properties of model airplane enamels and lasting just as long (for the life of the insect, with rare exceptions). If one is careful to keep the cap reasonably clean and tightly in place between uses, these pens last a whole season. The problem of too-thick of too-thin paint is completely eliminated. In short, they are a joy to use.

DIFFERENT METHODS TO STABILIZE NESTS OF BEES, WASPS AND ANTS

by
Till Osten
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In Sphecos 16:15 Chris Starr describes a durable but complicated method of preserving paper nests, especially those of Stenogastrinae (Acetone + pingpong ball). Our museum has similar problems with conserving and repairing nests of Hymenoptera. The paper nests of Vespidae and Formicidae, and the mud nests of Eumeninae, Sphecidae, Apidae and also Isoptera are often damaged when removed from their substrate and by subsequent transport.

About ten years ago we started to test different hair sprays for stabilizing the nests of Hymenoptera. Those sprays that are not sticky give the best results because after drying the nest does not look too shiny. Hair spray is convenient in the field because it dries very quickly. The procedure is always the same: spray only a little of the stabilizer on the nest, let it dry, and repeat the same procedure 3 to 4 times.

Later we had good results with a special wood glue (PONAL). THis white coloured glue dilutes with water. This dilution (about 1:3) is applied using a normal flower-spray (small hand sprayer). After drying the white colour of the glue vanishes. The glue is only a little shiny. This method is very suitable for repairing old, damaged paper nests. After use, immediately clean the hand sprayer with water!

For about two years we have had the best results with ZAMIFORM- ISO (obtainable from: Öl- Sauer, Wilhelm Sauer GmbH, Breitlacher Strasse 40 - 44, D 6000 Frankfort/ M. 90). It is an acrylacid-ester with a special admixture which the firm understandably does not describe. Normally it is used for stabilizing brittle masonry and wood. We also spray ZEMIFORM- ISO with a normal flower-spray on the different types of paper and mud nests and repeat this procedure 3 to 4 times. After this procedure old paper nests look very colourful again, but not shiny, and mud nests become quite stable. Now they are ready for further investigations of their insides. If the nests are opened, we repeat the procedure on the inside to stabilize the inner architecture. In this connection I would like to thank our preparator Uwe Döser for his experimental work and ideas of strengthening the different types of insect nests.

STRENGTHENING WASPS NESTS: A FURTHER NOTE

by
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Further to Chris Starr's note on strengthening wasps nests for preservation (Sphecos 16:15), the technique we recommend in BMNH is to spray or brush diluted PVC glue on to the surface of nests. This substance is simpler to obtain and much easier to use. It has the further advantage of drying transparent, so avoiding a possible white deposit produced by the other method.

THE CHLOROFORM GUN: A MULTI-PURPOSE COLLECTING TECHNIQUE

by
Colin Vardy

Have you ever gone insect shooting? Many years ago Jim Grant, who was at the time working in BMNH on New Forest Cicadas, mentioned his "alcohol-gun" technique to me. It was designed to "shoot" elusive cicadas, grasshoppers and the like, so that they would be wetted and thus immobilized for long enough to be more easily caught. The apparatus consisted of a toy water-pistol filled with strong alcohol. I experimented with this idea for some time, but encountered several problems. Basically, only 2 types of gun barrel were available; one, made of cast metal with a rubber bulb, had too short a barrel to be accurate; the other was made of polystyrene which was gradually softened by the alcohol. Finally, field tests with actual insects showed that alcohol was not very effective in delaying them, even when you scored a direct hit.

After further experimenting, it emerged that all the necessary criteria were met very well indeed by shooting chloroform from a large hypodermic syringe fitted with a coarse needle. Even a "near-miss" usually has a marked delaying effect on the target, so that there is the chance of a second shot. The liquid does not disperse as broadly as one might imagine; there is still a "spread" of only about half a metre even at a range of six mitres (about the maximum in either a horizontal or a verticle direction). With only very little practice it is quite easy to shoot down a large insect in flight, since the chloroform acts almost instantly. Before listing the purposes for which I have used the technique, it is necessary to draw attention to the following matters:

1. There is no good substitute for chloroform in my experience. I have experimented with ether, for example, with very disappointing results.

2. Syringes MUST be made of polypropylene NOT polystyrene, because the latter will collapse instantly on contact with chloroform.

3. Don't let spray drift into your eyes when shooting upwards - it stings.

Individual techniques.

1. For nests of Social Wasps out of reach, e.g. on the ends of hanging branches well away from the trunk of the tree, and too high to pull down. First, make notes on the nest structure. Then hold out a net immediately under the nest (or spread a sheet on the ground) and spray the nest with chloroform, when a few wasps will be sufficiently affected to fall into the net. However, you will have to be fairly quick to seize them, not only because they recover quite quickly, but also some of their less affected brethren many show their displeasure. It's good sport because it's not all one-sided.

2. For securing insects e.g. bees visiting flowers out of reach (either because they are high up, or because they are on spiny bushes). The technique will easily bring down even large bees like Bombus or Xylocopa.

3. For shooting down insects in flight, e.g. Pepsis wasps ("Tarantula Hawks").

4. For collecting wasps or bees which are on mud at lake margins etc. It is only necessary to locate a well-visited patch of mud of hoof-print by observing for a few minutes, then crouch down with a chloroform gun and shoot the insects as they arrive; of one can often succeed by carefully creeping up on them, bearing in mind that they are usually facing downwards, so that you can see their rear ends and shoot them before they can see you. This saves much frustrating time and effort with nets which usually remain persistently empty or get horribly messed up with mud, according to your technique.

5. For collecting female Mutillidae or ants which run fast and/or sting painfully. The technique saves much time and effort; the specimens are simply picked up with a pair of fine-pointed forceps and placed in the killing jar for "finishing-off"; there is no chasing them under herbage with a glass tube, ending up with a tube half-full of sand and a very dusty insect to sort out as best one can.

6. For taking wary insects visiting flowers (e.g. fast-flying bees and wasps); or wasps or grasshoppers on the ground which are difficult to approach closely enough to catch with a net. Such insects often take flight at about 2 metres distance, i.e. just beyond the reach of a hand-held net. The chloroform gun will get them at up to 6 metres, which they certainly don't expect. If you completely miss, you may well find they are not so badly frightened that they will disappear far away or for long (depending on species); even a near-miss will often give them enough of a dose to slow them down considerably.

7. For securing large moths etc. high up on tree trunks. If the moths are too high to reach with this technique, you probably won't be able to spot them anyway.

8. If you have, say, a dangerous insect such as a Hornet or large Pepsis in your net on the ground (held close with your foot, not your hand!), it is a simple matter to push the needle through the net to contact the insect, and a slight pressure on the plunger will produce an instant effect; they can then simply be lifted out of the net with forceps.

For use in techniques 1-3, use a 30ml syringe fitted with a coarse (say 50mm, 19G) needle. For close-quarter techniques such as 5 or 8, a much finer needle fitted to a 20ml syringe is sufficient, as well as economizing on chloroform. However, even when using a coarse needle, it is surprising how little chloroform is used up. You will quickly learn by experience which size of needle to choose for a given job; if in doubt, err on the side of large needle/large syringe.

The obvious difficulty with this collecting method is obtaining chloroform. In the case of travel to countries where it is very difficult to obtain, whether you are prepared to risk taking it (marked "insect repellent") in airline cabin baggage is your problem; if you do, the chloroform should be in the special, strong bottles made for it. For a short trip of, say, two weeks, if should be sufficient to take 2 x 25ml bottles (with some space above the liquid) each packed

with plenty of wadding inside another airtight container, such as a wide-mouth polythene jar with a screw top. This should withstand almost any impact or pressure change. It is best to have more than one container of chloroform not only in case of breakage but in case some is lost in any other way.

The chloroform-gun technique has proved its worth many times in my own collecting; indeed, it is sometimes the only way to collect certain insects. For example, we found a blue-flowered shrub some 4m high growing beside a narrow track around the mountainside at Macchu Pijchu; the flowers were being visited by a reddish-brown bumble bee. It was not possible to reach the flowers, not only because of their height but also because it would have been impossible to reach up through or around the rather dense branches without disturbing the bees. Two males and three workers were quite easily secured with a chloroform gun: they proved to be the rarely-collected Bombus handlirschii.

Collecting Report

COLLECTING IN FUERTEVENTURA, CANARY ISLANDS

by
Colin and Martha Vardy
(Dept. of Enomology, British Museum (Natural History),
Cromwell Road, London SW7 5BD, England)

Our two weeks stay in the Canary Islands over Christmas and the New Year was really a holiday, but as we also collected, a report is in order (to use Arnold Menke's phrase). It was great to have a holiday instead of a car crash. The rains were both heavy and early this season, so that when we arrived the desert was like a garden. We also had the great good luck to be introduced to a German amateur entomologist and his wife, who knew the island quite well. We made several most enjoyable and rewarding trips together. Apart from bees, Pompilidae were easily the most common group of Aculeata, albeit with considerably fewer species than bees or sphecids. Amongst Eumenidae, we took a Delta dimidiatipennis, a genus new to the Canaries; Katamenes nigra, Ancistrocerus kerneri, and Euleptochilus fortunatus. An old nest of Delta was found on the stonework above a hearth open to the outside, while the Ancistrocerus was nesting in the ends of some horizontal bamboos forming a shading-screen some 2.5m above the ground. Another interesting capture was the bee Anthrophora alluaudi, which was collected in the past in at least two other localities on the island, at similar altitudes; also on rather high ground in Lanzarote; its foodplant, however (Echium species, Boraginaceae) occurred virtually everywhere. The bee is basically black in these two islands, but occurs in a paler form in, at least, Tenerife, La Palma and Hierro. It remains to be seen whether these are merely colour forms of a Sahelian species; at present they are regarded as endemic to the Canaries. Most of our collecting was done on the south-east coast of Jandia, the large southern peninsula of Fuerteventura. Apart from Hymenoptera, we collected some exciting-looking caterpillars. They were about 6cm long, and white with black and orange spots. They were, of course, very easy to see on their foodplant, Dipcadi serotinum (Liliaceae). This looks very like a brown-flowered Bluebell growing in the desert. A few weeks after being collected, these larvae produced the beautiful noctuid moth Polytela cliens, another new record for the Canary Islands. This species, as also many of the Hymenoptera, is basically Sahelian. Since many show marked differences from the Saharan forms (some people call them "subspecies"), they may well have been there ever since the easternmost islands drifted away from the Ifni Gap in West Africa a few years ago (geologically speaking).

We later heard that about a week after we left the island a violent storm had caused a flash flood in the barranco (=wadi) near where we had stayed, and changed the face of the coast. We had collected there just in time....

T-Shirts Available

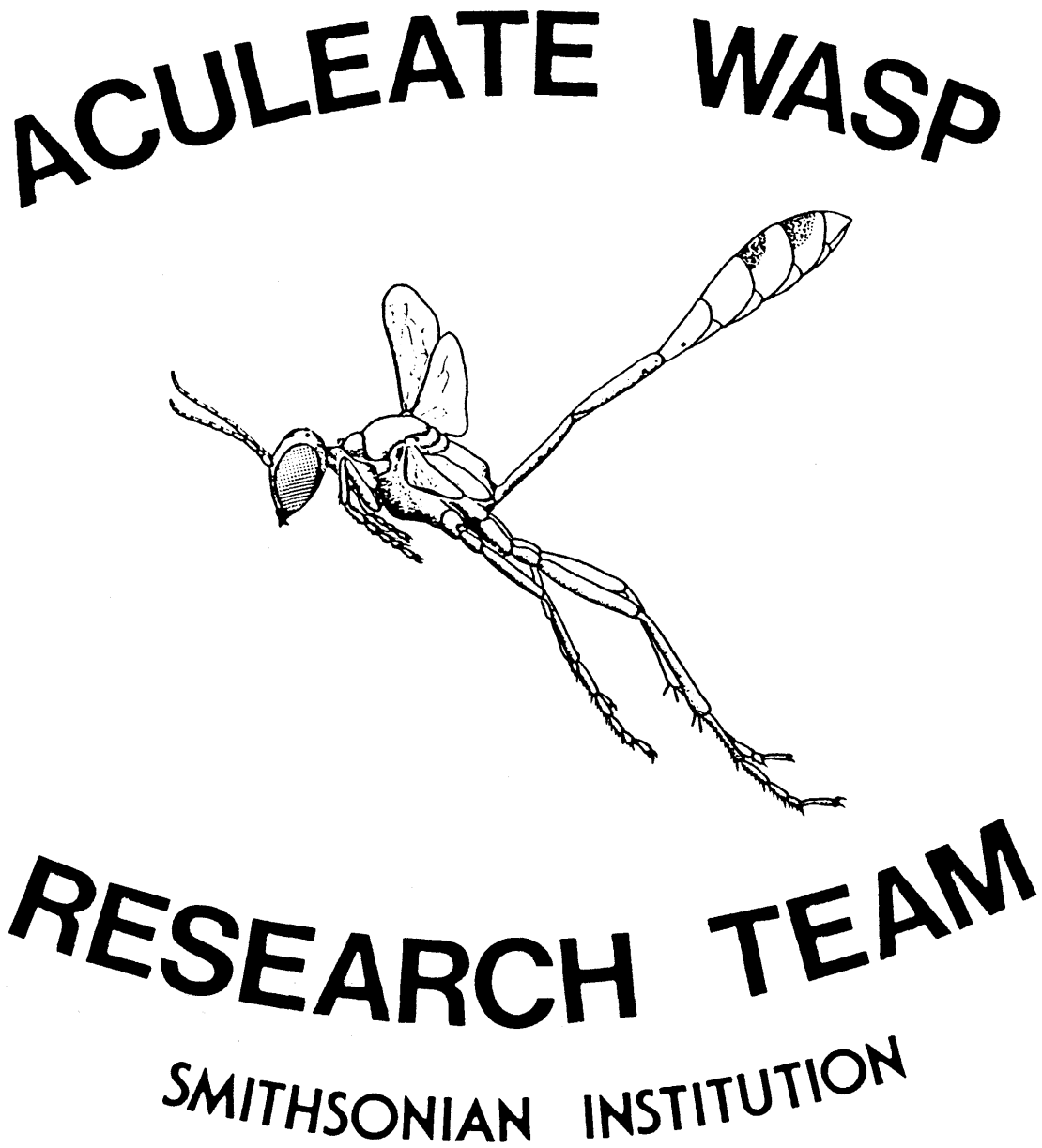
Two T-shirts are now available. One is the now widely sought after "Aculeate Wasp Research Team" logo (AWRT) depicted below. The other shirt is printed front and back with two different designs depicting the now infamous Bill Ashmead. One of the designs on the Ashmead shirt - "The Ashmead Club" - was shown on page 48 of Sphecos 9 (1984). The other design on the Ashmead shirt will be the scandalous "Club Ashmed" shown on next page (preliminary design).

The AWRT shirt will cost $11.00 (includes postage). If you want one (or more), send me (A.S. Menke) a check. State your shirt size (S, M, L, XL), and color preference (give more than one color in case your first choice is unavailable - silver gray, beige, gold, red, white, etc.). Shirts will be high quality 100% cotton.

Shirt number two (Ashmead) will also cost $11 per shirt (includes postage). Be sure to indicate your shirt size, color preference, and send in a check for the proper amount.

Do not expect your shirt to arrive quickly - I will wait a month or so after mailing this issue so that I can accumulate all orders before having the shirts printed.

A. S. Menke, prop.



GET CEREBRAL GUMMA

at

Club Ashmed

Announcements

Taxonomy and Biology of European Hymenoptera to be held at Sheffield England, 3-9 September 1989. 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 accommodation and board will be approximately £150.00; some travel bursaries may be available.

Please write to: Donald Quicke, Department of Animal Biology, Sheffield University, Sheffield, S10 2TN, England, for further details.

Parasitic Hymenoptera Course. The Hymenopterists (USDA Systematic Entomology Laboratory, Biosystematics Research Center, Ottawa, Canada and the American Entomological Institute) who produce the annual Parasitic Hymenoptera identification short course for the Maryland Center for Systematic Entomology are considering holding their course in Honolulu, probably in the summer of 1989. The course would be co-sponsered by Bishop Museum and the University

of Hawaii. Please let the Bishop Museum know if you are interested in participating: a mailing list is being developed for further information. Bishop Museum, Department of Entomology. P.O. Box 19000-A, Honolulu, HI 96817, U.S.A.

Center for the Study of Social Insects. The Universidade Estadual Paulista (UNESP) in Rio Claro, SP has established a Center for the Study of Social Insects. Currently, 20 professors work intensively with social insects, which is one of the largest, if not the largest, concentrations of researchers of social insects in the world. The center is especially strong in bee genetics, apiculture, social wasp biology, insect anatomy and histology, and myrmecology. A major impetus of the center is to try to rectify a tremendous shortage of systematic and taxonomic expertise, as well as to provide a frame work for interdisciplinary research, both among the researchers of the center, as well as in collaboration with other national and international researchers and institutions. Preliminary contacts have been established with several European, Latin American and North American institutions, and persons interested in further information or cooperative projects, or even a research base in the Neotropics, should contact either Osmer Malaspina or Harold Fowler, Instituto de Biociencias, UNESP, 13500 Rio Claro, Sao Paulo, BRAZIL.

Hawaii Arthropod Database and Hawaiian Invertebrate Survey Pilot Program. Bishop Museum's card file on Hawaiian arthropods has been converted into a computer database covering basic taxonomic and distributional information. Gordon Nishida and Al Samuelson are coordinating efforts to check and update data on over 8000 species (over 13 Mb of data so far). This database will provide the foundation for renewed efforts to survey the Hawaiian fauna.

The John D. and Catherine T. MacArthur Foundation has just awarded a grant to the Museum's Departments of Entomology and Zoology to develop the means for filling the major gaps in conservation efforts that are currently overlooked owing to lack of knowledge of the invertebrate fauna of Hawaii (some 8000+ arthropods and 1000 land snails).

This pilot program supports the completion of the arthropod database, extablishing a baseline from which the foundation of a large scale project may be launched. It will sponsor a definitive workshop to establish the problems, discuss approaches, and develop the directions to implement the larger project.

For more information: Scott E. Miller, Dept. of Entomology, Bishop Museum, P.O. Box 19000-A, Honolulu, Hawaii 96817.

Bishop Museum initiates rainforest canopy insect research in Papua New Guinea. With a grant from the New England Biolabs Foundation, the Bishop Museum's Departments of Entomology and Zoology are initiating the first phase of a long-term project to explore the diversity and ecology of insects in the treetop canopies of rainforests in Papua New Guinea. The program, which is a cooperative venture with the Wau Ecology Institute (Wau, Papua New Guinea), is led by the Chairmen of the Museum's Departments of Zoology and Entomology, Drs. Allen Allison and Scott Miller, respectively. This effort is an outgrowth of earlier work by Dr. Allison and Museum entomologist Dr. Wayne Gagné.

Along with developing a database on diversity and ecology in New Guinea, results will be compared with those of Dr. Terry Erwin (Smithsonian Institution) in South America, Dr. Nigel Stork (British Museum) in Southeast Asia, and Dr. Wayne Gagné in Hawaii. Erwin's work has revised basic concepts in tropical ecology, especially by postulating that there may be as many as 30 million species of insects in the world.

For more information: Scott E. Miller, Dept. of Entomology, Bishop Museum, P.O. Box 19000-A, Honolulu, Hawaii 96817.

CONOPID RECORDING SCHEME

(excerps from the newsletter, Conopid Recording Scheme)

Hello Hymenopterists!

As most of you will know, the conopids are a parasitic group, preying entirely on Hymenoptera in Britain (as far as we are aware). Since there is such a close relationship between the Conopidae and the Hymenoptera, it seems most sensible that there should be a

similarly close relationship between Conopid recorders and the Bees, Wasps and Ants Recording Scheme. This Newsletter will therefore be circulated to the the BWARS participants, as well as to everyone on the Diptera Recording Scheme register, at least in the first instance. However, subsequent issues will only be circulated to people listed under either 'C' of 'All' on the most recent Diptera Schemes address list (Dec., 1987), and to anyone else who has specifically requested it.

Collection of hosts - If you see a conopid wrestling with a Hymenopteran, or ovipositing on one, or interacting in any other way with one, COLLECT THE HYMENOPTERAN as well as the Conopid. It is always possible to get the host identified (contact me), and the specimen may yield a bounty of valuable data - the site of oviposition perhaps, or the caste and condition of the host. The Conopid ovum will probably never have been described, still less reared through, and with the host securely pinned next to its Conopid antagonist, its scientific testimony is preserved for others to ponder. Remember, it is vital to keep the host and parasite specimens (and any associated bits and pieces) mounted together, or clearly labelled with full, duplicate data, so that they can always be associated with each other in the future.

For more information: Brian Eversham (Inst. Terr. Biol., Monks Wood Exp. Sta., Abbots Ripton, HUNTINGDON, Cambs. PE17 2LS England).

ACULEATE HYMENOPTERA WORKSHOPS - UNIVERSITY OF TEXAS' BRACKENRIDGE FIELD LABORATORY

by
Allen Hook
(Dept. of Zoology, Univ. of Texas, Austin, Texas 78712)

Three Saturday workshops on aculeate Hymenoptera systematics and biology were held during April 1988, at UT's Brackenridge Field Laboratory (BFL). Wasps, bee, and ants were the groups surveyed during these workshops. Jim Carpenter, Joan Strassman and A. Hook organized the wasp workshop; George Eikwort and Jack Neff led the bee workshop; while Bill MacKay and Sanford Porter directed the ant session. Without bias, I can state that all three sessions were extremely successful - at least I greatly benefited from attending them. Aculeates were chosen, in part, because of resident BFL specialists on wasps, bees and ants, and because local collections of the fauna were available for study during the lab sessions. Furthermore, given the area BFL encompassess (ca. 80 acres along the Colorado River within Austin), aculeate diversity is quite impressive. Presently, about 180 bees; 50 ants; 120 sphecids, 40 vespids and 30 mutillids are known from BFL. Pompilids (yet unworked) must represent another 30 or more species. Thus, we are talking of over 400 aculeate species recorded at BFL, even though this figure does not include several other important groups (yet unworked).

Larry Gilbert (BLF Director) initiated, scheduled, and secured funding for these workshops, so as to promote BLF and central Texas as excellent resources for researchers in hymenopteran biology. Anyone desiring further information on the facilities at BLF should contact Larry at the zoology dept., UT-Austin.

Workshops were attended by faculty, postdocs, graduate and undergraduate students of the the University of Texas, Texas A&M University, and Rice University; also in attendence were officials of the Texas Dept. of Agriculture. Each workshop had from 20-25 participants; registration and copies of taxonomic literature were provided at no cost to everyone in attendence. Sessions began with specialists giving brief talks on the systematics and biology of their groups. After this, lab studies commenced, running until early afternoon. The remainder of the day was spent in the field at BFL, experiencing the ecologies and lifestyles of the groups studied in the lab.

I shall now limit this report to those events surrounding the 1st workshop on wasps. Jim Carpenter, our invited wasp expert, arrived Wednesday afternoon (13 April). Thursday, in addition to preparing for the upcoming workshop, Jim gave a lecture in Dave Hillis' Systematics class, and finally a departmental seminar on the evolution of wasp social behavior.

Friday, Joan Strassman and Dave Queller pulled in from Houston, and then took a group of us out to their Polistes annularis site at Lake Travis. Here, nests were attached to the face of a 30m high cliff with an overhang. Steep stairs led down to the base of this cliff,

only they stopped 3m short of the actual landing, which consisted of jagged boulders. This was not the sort of trip (coming and going) one cares to make too often! Some of Joan's students had been camping at this site, collecting wasps for a relatedness study. After taking pictures of Polistes (and of Joan changing into her swim suit) a few of us briefly collected in the scrub habitat above the cliff. On the return trip to Austin, Jim, Sanford and I stopped and collected along the Pedernales river and at Hamilton Pool (spring that enters the river). While walking along the trail to Hamilton Pool, we passed some red-necks that snickered as we passed them - needless to say, we stomped their butts into the ground.

That evening we took Jim to a Texas barbecue resturant that is famous for its quantity and quality of food. We stategically sat on the deck overlooking a creek filled with large snapping turtles - as we soon had our fill and began to feed the snappers (they even ate the hot peppers we threw to them).

Saturday morning Jim began the workshop by making a presentation of the taxonomy and biology of about 12 major wasp groups; particularly nice were his slides of wasps, nests, key morphological characters, and phylogenies. Following, Joan introduced the vespines and polistines, emphasizing their usefulness in social research. Next, I tried to convince the audience that sphecids are by far the most interesting aculeates. The field trip went fine, except an overcast sky and some light showers reduced wasp activity. Jim really put a lot of effort into this workshop, and its success can largely be attributed to this fact. Also, it was easy to see that Jim has a new group of interest - Sclerogibbidae; in fact, he kept raving about how there should be sclerogibbids at BFL, and why had I not collected any, and that I should find some!

Sunday morning the weather was still suspect, so Jim took time to put some finishing touches on the BFL vespid collection. Late morning the clouds began to break and so we drove east to Bastrop State Park and its sandy pinelands. Soon, a wall of thunderstorms stood in our way, thus we turned around to head 30mi. west of Austin to Pendernales Falls State Park. There we experienced some excellent collecting, and in about 3 hrs. we picked up slightly over 100 eumenines (only 2 were males). Most females were taken as they landed along a dirt road, and some were collected at nests located in a vertical dirt bank. All total, we took 12 species that Jim determined as follows: Eumenes bollii. E. smithii, Ancistrocerus adiabatus, Euodynerus foraminatus scutellaris, E. annulatus, E. castigatus, Parancistrocerus austrinus, P. fulvipes, Stenodynerus microstictus, S. taos, S. propinquus, and S. ventones.

Additional Errata for the Big Blue Book

Again I have Woj Pulawski to thank for much of this stuff. He is relentless in his search for mistakes and omissions. The Mud D'aub.

P. 483: Key to genera of Gorytini.

Austrogorytes Bohart is misplaced in the key. The following modification to couplet 3 will permit identification of this genus.

3. Inner orbits converging below, least interocular distance about half that measured at middle of ocellar triangle or less (fig. 159 D, H) 3a

\- Inner orbits essentially parallel or converging only slightly below (fig. 159 G, I); least interocular distance not less than two-thirds that measured at middle of ocellar triangle 4

3a. Mesopleuron with carina above subalar pit that extends from scutal margin to mesopleural suture; jugal lobe same size as tegula or smaller; inner veinlet of submarginal cell II arcuate before angulation near RS+M (fig. 157C); Australia . . . . . Austrogorytes Bohart, p. 498.

\- Mesopleuron without carina above subalar pit; jugal lobe larger than tegula; inner veinlet of submarginal cell II essentially straight until angulation near RS+M; North America . . . . . Hapalomellinus Ashmead, p. 496.

p. 124, LC, L 20: 1898 is correct, not 1897
p. 153, RC, L 31: 1898 is correct, not 1897
p. 154, RC, L 3: 1898 is correct, not 1897
p. 173, RC, insert as species after L 26: patei Arnold, 1940; Zimbabwe
p. 174, LC, insert as species after L 8: stevensoni Arnold, 1940; Zimbabwe
p. 179, RC, L 22: Turkmen SSR is correct, not Mongolia (as reported incorrectly in Sphecos 14:33)
p. 185, RC, L 32: (Passaloecus); Liberia is correct, not (Pemphredon); Zaire
p. 238, LC, L 12 from bottom: ssp. luzonensis is correct
p. 291, LC, insert below L 13 as subspecies: spp. croesus Arnold, 1951; Ethiopia
p. 295, LC, L 29: frontalis is correct
p. 304, RC, L 12-14: change endings from -us to -a.
p. 347, LC, L 11: Uganda is correct, not Zaire
p. 347, LC, L 12: insulsum is correct
p. 382, RC, L 9: change entry to: 1926:344 (Thyreopus)
p. 401, RC, L 10: 1971, not 1970
p. 402, LC, L 6 from bottom: minutulus is correct
p. 420, RC, L 17-19 from bottom: change species entry as follows and transfer to: p. 421, LC:
vumbuiensis (Arnold), 1940 (Crabro); Zaire, Burundi, Ruanda, Zimbabwe
collaris Arnold, 1932 (Thyreopus), nec Crabro collaris Matsumura, 1912
p. 421, LC, L 18 from bottom: stevensonianus is correct name for species, not stevensoni. Arnold, 1940:135 proposed stevensonianus as a replacement name for stevensoni Arnold, 1926:344. Entire species entry should read:
stevensonianus (Arnold), 1940 (Crabro); Ethiopian Region
stevensoni (Arnold), 1926:369 (Thyreopus), nec stevensoni (Arnold), 1926:369, not stevensoni Arnold, 1926:344 (Thyreopus),
occidentalis Arnold, 1951 (Crabro)
p. 424, RC, insert as species after L 6: arrogans (Arnold), 1958 (Crabro); Zimbabwe
p. 458, LC, L 23: Ukrainian SSR is correct, not Poland
P. 484: Eliminate couplet 11 and substitute "Pterygortes Bohart, p. 523" for "11" at end of L 35.
p. 496, LC, L 11 from bottom: Lesotho is correct, not Ethiopia
p. 513, LC, L 9 from bottom: 1898 is correct, not 1897
p. 522, RC, L 2 from bottom: (fig. 159 O) is correct
p. 531, LC, insert as subspecies after L 28: ssp. chirindensis Arnold, 1936; Zimbabwe
p. 545, LC, L 16: albata is correct
p. 545, LC, L 21: albopilosa is junior synonym of albata
p. 546, LC, L 16 from bottom: flavicincta is correct
p. 546, RC, L 6 from bottom: tenebrosa is a synonym of diversipennis
p. 547, LC, L 10: Arnold 1931:219 synonymized laeta with intermedia which is tentatively synonymized under olivata on p. 548.
p. 547, RC, L 13: Mozambique is correct, not Ethiopia
p. 548, RC, L 31: speciosa is junior synonym of regnata
p. 548, LC, L 18: opinabilis is a synonym of stadelmanni
p. 548, LC, L 22 from bottom: stevensoni is a synonym of fuscipennis
p. 584, LC, L 2 from bottom: 1898 is correct, not 1897

Intrepid Explorers Develop Ursine Tendencies

The alarming news has recently been received that explorers who travel too far on foot by certain routes may be taking unanticipated risks.

The latest Sphecos (16:20) contains a report on three entomologists who went on foot for 80 miles, passing the end of a short road which bearly penetrated a mysterious mountain region known as Kings Canyon, and apparently developed ursine tendencies as a result. These tendencies were doubtless exacerbated by the fact that the travellers passed through Paradise Valley en route; this location is said to be very attractive to bears.

This unusual syndrome, apparently hitherto unreported in the literature, may be analogous to the Piscean Syndrome. The latter is brought about by spending too long a period living in

a "diving bell" under the sea, and is characterized by the development of a fish-like mentality.

The "Ursine Syndrome" awaits further investigation; Dr. Arnold Menke, the leader of the above-mentioned expedition, is requesting volunteers for further experiments. It is understood that he is bearly containing his excitement at the prospect of further results.

Colin Vardy

Social Wasp News

DOLICHOVESPULA MEDIA

Robin Edwards says that this wasp is established in southeastern England. The BM has 2 nests.

VESPA SIMILLIMA XANTHOPTERA

Robert Jacobson reports that he identified a queen of this Japanese wasp collected in a garden at Shawnigan Lake, British Colombia in August, 1977. It is not known if it is established. [Bob, is this a valid subspecies?]

SUMMARY OF VESPINE WASP REFERENCES, 1951 TO 1985

by
Robin Edwards MSc*, FRES**, FFUCC***
(Rentokil Ltd., Felcourt, East Grinstead, West Sussex RH19 2JY, England)

With 35 years of references now in my computer database, I thought it would be interesting to summarise some of the data. I have considered most of the figures in five-year groups.

First, however, the block diagram (Fig. 1) shows the total number of records for each of the 35 years. The surge of interest in the Vespinae starting in the 1970s is largely due to the

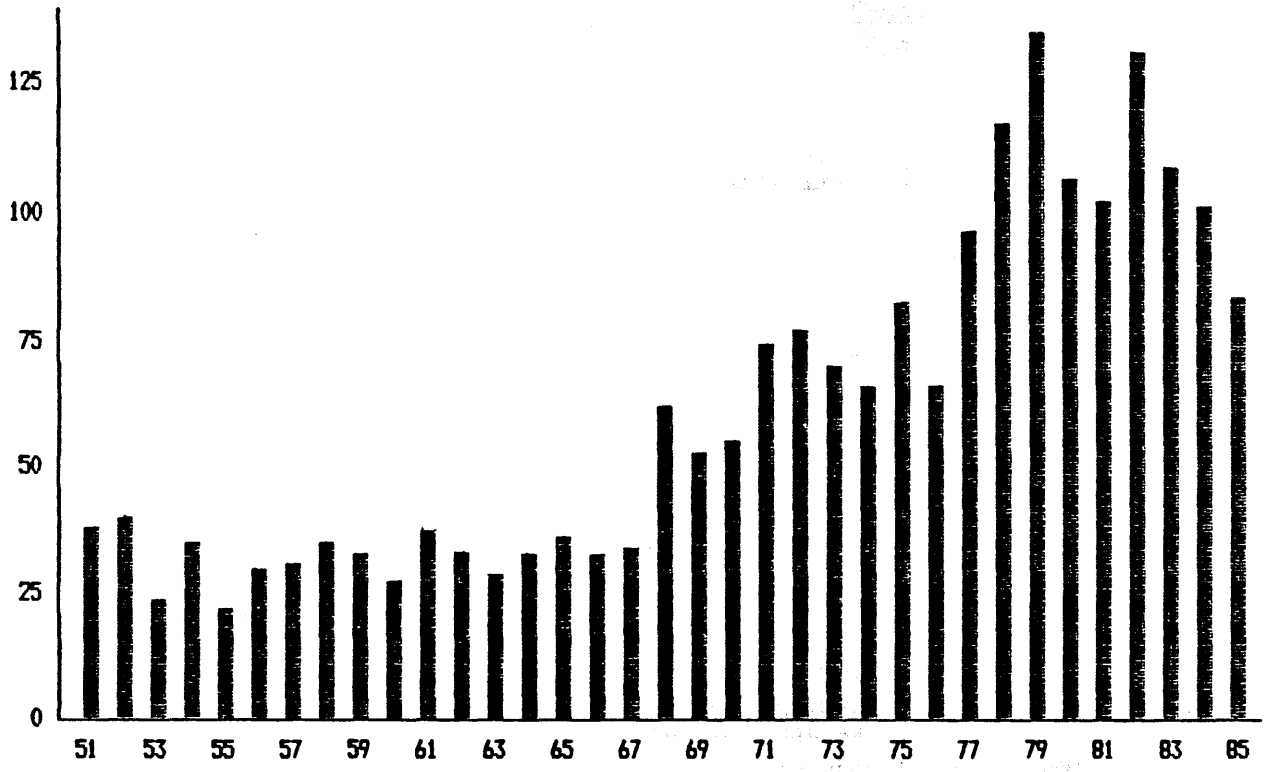


Fig. 1. Total Records per Year, 1951 - 1985

* member, Much Swearing at the Computer association
** needs no explanation
*** Fellow of the Fed Up with Carpenter Club

work of Roger Akre and his band of merry men (no women, Roger!) and at the same time the building of a team of workers by Jacob Ishay in Israel. The main peak of activity in 1978 to 1984 has come about, as we shall see in a moment, from the superimposition of much work in the medical field. Today, the trend is downhill - 83 records in 1985, and so far, 85 in 1986 and only 54 in 1987.

One thing this does show is that I wrote my book, "Social Wasps" (published 1980) at the wrong time! I should have waited another five years before completing the work. On the other hand, Philip Spradbery got his in at the beginning (1973), and it is tempting to think that his book may have given some impetus to the vespinologist's movement.

I remember looking at a very large number of papers when researching my book, and now, with the records on computer, it is easy to see just how many I read at that time. This is shown in Table 1. My records indicate whether I have a reprint, photocopy or notes, or whether I just read the item in a library and made no notes. In the thirty years from 1951 to 1980, I saw nearly a thousand articles (over 60%)! And of course this does not include the many pre-1951 publications.

The number of contributions in the major languages are shown in Table 2. This must be viewed with caution - there appears to be a big reduction in the numbers in German and in Dutch, but this could in part be due to fewer workers in those countries now. However, I know

5-year periods	Total Records	Reprint or copy No. : %	Seen, but no notes No. : %	Not seen No. : %
51-55	159	45 : 28·3	33 : 20·7	81 : 50·9
56-60	156	33 : 21·1	53 : 33·9	70 : 44·8
61-65	168	38 : 22·6	57 : 33·9	73 : 43·4
66-70	237	69 : 29·1	82 : 34·5	86 : 36·2
71-75	370	146 : 39·4	100 : 27·0	114 : 30·8
76-80	519	230 : 44·3	93 : 17·9	179 : 34·4
81-85	524	204 : 38·9	25 : 4·7	294 : 56·1
35-yrs	2133	765 : 35·8	443 : 20·7	897 : 42·0

Table 1. Number of papers seen by the author.

5-year periods	EN	DE	FR	JA	RU	NL	IT	ES	Others
51-55	40·8	27·6	7·5	6·2	1·2	10·0	3·7	0·6	6·2
56-60	58·9	18·5	5·1	3·8	1·2	4·4	3·2	1·2	8·3
61-65	52·9	21·4	10·7	7·7	1·7	1·7	0·5	0·0	3·5
66-70	67·5	10·5	7·5	8·8	0·4	2·1	1·2	0·4	4·2
71-75	79·4	5·4	7·0	4·0	1·0	0·2	0·5	0·5	2·7
76-80	85·1	4·4	2·8	2·5	1·9	0·0	0·9	1·1	3·0
81-85	84·3	4·1	3·2	1·5	3·2	0·1	0·1	0·3	3·0
35-yrs	74·2	9·3	5·3	4·0	1·8	1·5	1·0	0·6	3·7

Table 2. The percentage of records in the major languages.

that the number of papers by the Japanese is still quite high - they have clearly made a great effort to change to writing in English, and we must thank them for making their valuable work more readily available to us.

Lastly, Table 3 gives the percentage of records for most of my broad subject areas. Determing a set of subject codes was not easy, due to much overlap of subjects in some publications. One area where I could, perhaps, have improved things was to have a category for

5-year periods	AM	BE	CN	EX	FB	GR	GW	IS	NA
51-55	3·1	10·0	5·0	3·1	7·5	8·1	4·4	2·5	7·5
56-60	5·7	5·7	5·1	3·2	9·6	14·1	5·1	1·2	11·5
61-65	3·5	8·3	2·9	1·1	14·2	10·7	5·3	0·5	9·5
66-70	6·3	8·4	0·8	4·6	5·4	10·5	4·6	1·2	12·2
71-75	2·7	8·3	1·3	5·4	5·4	9·1	5·9	1·0	8·9
76-80	3·2	4·2	2·8	5·7	8·2	9·6	3·0	0·3	3·8
81-85	3·0	4·9	4·3	5·5	5·1	9·7	5·1	0·0	2·4
35-yrs	3·6	6·4	3·0	4·7	7·2	9·9	4·6	0·7	6·6

Table 3 (above and below) The percentage of records dealing with the major subject areas used in the database.

5-year periods	NE	PC	PD	PH	SL	SP	SA	SM	VE
51-55	13·8	12·5	1·2	2·5	3·1	0·6	0·0	5·0	2·5
56-60	7·0	8·9	0·6	1·9	3·2	2·5	0·6	8·3	4·4
61-65	7·1	6·5	4·1	2·3	5·9	0·0	0·0	11·9	3·5
66-70	5·4	10·5	0·8	6·7	4·2	0·4	1·6	10·1	3·7
71-75	4·8	9·1	2·4	7·0	5·6	0·5	1·3	11·8	7·0
76-80	6·3	5·9	2·6	4·6	5·3	1·7	0·5	19·8	10·2
81-85	7·4	3·8	2·4	6·2	4·9	1·9	0·9	19·8	12·7
35-yrs	6·9	7·2	2·2	5·1	4·9	1·2	0·8	14·8	8·0

Codes:
- AM Anatomy and Morphology
- BE Behaviour
- CN Classification, Nomenclature, Identification
- EX Experimental
- FB Food and Feeding Behaviour
- GR Geographical Range; Species lists
- GW General Works
- IS Immature Stages
- NA Nest Associates and Predators
- NE Nests and nesting behaviour
- PC Wasps as Pests and their Control
- PD Population Dynamics
- PH Physiology
- SL Social Life
- SP Social Parasitism
- SA Sting Anatomy and use
- SM Stings; Medical aspects
- VE Venom; chemistry and physiology

single-species monographs - these now come under the heading, General Works.

It is difficult to explain some of the trends shown, and one wonders why there was so much interest in food and feeding behaviour (FB) in the 1956-1965 period. Lists of vespinae in specific areas (GR) has continued at a surprisingly high level throughout the 35 years, but study of the immature stages (IS) has been minimal.

What can be explained is the great expansion of research in the medical field (SM) and the associated work on the venum (VE). This has followed the discovery of immunoglobulins and the explanation of the way venums produce their various effects on people. Also, improved analytical methods in the 70's allowed workders the opportunity to discover the complexity of insect venoms.

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(compiled by Robin Edwards)

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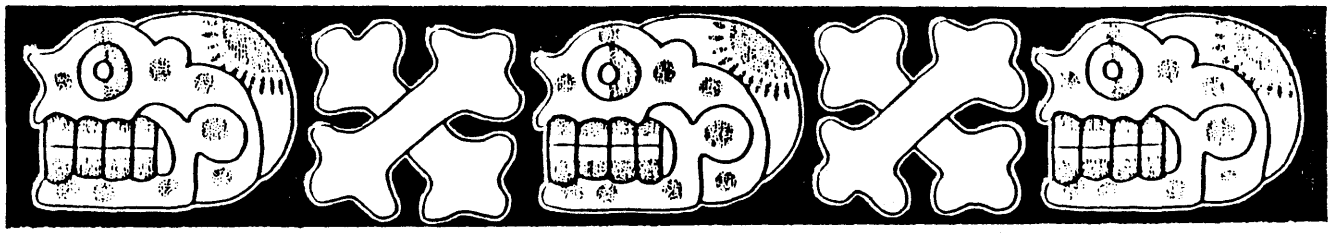
ADDENDUM DE DUM DUM

Late Breaking Research News

David McCorquodale (Dept. of Environmental Biology, Univ. of Guelph, Guelph, Ontario, N1G 2W1, Canada - note this is a new address) writes: I have just completed my Ph.D. thesis entitled "Nest sharing in the sphecid, Cerceris antipodes Smith", at the Department of Zoology, Australian National University. Papers from this thesis on nest defense, relatedness among nestmates, and soil hardness and nest initiation have recently been accepted for publication. I am continuing to write up material on Cerceris antipodes here in Guelph.

Sérvio Tulio Pires Amarante (Museu de Zoologia da Universidade de Sao Paulo, Caixa Postal 7172, 01051 - Sao Paulo, Brasil) says: My main interest is ethology and systematics of neotropical Sphecidae. I am especially interested in male and hunting behaviors and in the relations between females in the subgenus Trypargilum of Trypoxylon. Now I am beginning my graduate studies (MS) in Zoology at the Museu de Zoologia here in Sao Paulo. I am studying the ethology of Trypoxylon albitarse F. under the guidance of Dr. Carlos Roberto Ferreira Brandao.

Rodrigo Torres N. (A. A. 19149, Bogotá, Colombia) writes "Habiendo creado con varios de mis estudiantes un grupo de estudio sobre las avispas solitarias colombianas, estamos adelantando un trabajo faunístico que incluye especies colombianas de las familias Sphecidae, Pompilidae, Mutillidae y afines. Simultáneamente estamos adelantando observaciones sobre el comportamiento de anidamiento de especies de esfécidos de los géneros: Ammophila, Prionyx, Tachysphex y Trypoxylon.



the mojo-temblor entomological institute Dr. David "The Philatelist" Wahl, prop.

NOTABLE REVISION OF NORTH AMERICAN TACHYSPHEX

Revision of North American Tachysphex wasps including Central American and Caribbean species (Hymenoptera: Sphecidae) by W. J. Pulawski - 1988. Mem. California Acad. Sci. 10, 211 p. Price $50. Available from: Scientific Publications, California Academy of Sciences, Golden Gate Park, San Francisco, Calif. 94118.

The sphecid genus Tachysphex is one of the larger genera in the family, and it is also one of the most difficult in terms of species discrimination. Woj Pulawski has made this genus one of his "life" projects. He has published revisions of Tachysphex occurring in the Palearctic, Neotropical and Australian Regions already, and his monograph of the North American species of the genus appeared early this year, culminating a research period of a dozen or more years that involved over 40,000 specimens!

The North American fauna (including Central America and the Caribbean) now contains 83 species, 20 of which were newly described in this revision. Of course Pulawski published 19 new species during the course of the work, so that he has at least doubled the number of species known. The species are divided among 4 species groups.

Glancing through the pages one is immediately impressed by the unusually high quality of the many scanning electron photomicrographs used to illustrate various species characters. Seldom, if ever, have I seen such fine SEM pictures! Obviously the material used was carefully cleaned or chosen with care. Unfortunately, Pulawski does not tell us anything about the techniques or type of machine used in making these SEM photos. There are only a few line drawings but they also are first rate. Distribution maps show the known ranges of species at a glance.

The introductory section includes discussions of morphology, life history, geographic distribution, classification (i.e. species groups), and unsolved problems. The morphology section seems inappropriately titled since it basically deals with character states of the genus, and it is prefaced by the remark that Tachysphex does not have a single autapomorphy. This section supposedly includes discussion of "all pertinent structural characters of the genus currently known ... " but some characters discussed in the generic description of the genus in Sphecid Wasps of the World by Bohart and Menke are unaccountably absent. The life history and classification discussions are global in nature. The section on classificaton is introduced by the statement that the supraspecific classification employed in the paper was arrived at intuitively, but that a worldwide cladistic analysis will follow. However, Pulawski did cladistically analyze the members of the terminatus species group. Apparently the other groups were not similarly treated because they may not be monophyletic - but all the more reason to have analyzed them cladistically! In his section on unsolved problems it would have been instructive if Pulawski had cited specific examples of things in need of further study such as the possibility that pompiliformis may be a complex of species. One generic synonym, Schistosphex Arnold, was omitted from the synonymy of the genus on p. 3.

The species treatments are preceded by an identification key that contains references to figures. The species treatments are extensive and generally excellent. Distribution records are sometimes exhaustive.

This is an excellent piece of research and one can appreciate why this publication was given the Award of Distinction by the American Association of Museums!

A. S. Menke