SPHECOS

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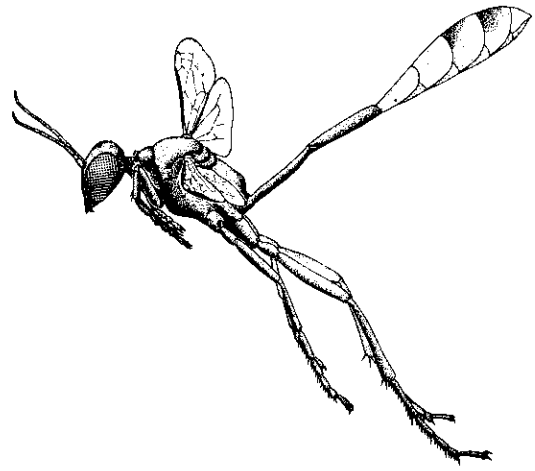
A Forum for Aculeate Wasp Researchers



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Editorial Meconia

Here is another fun packed issue of Sphecos. Highlights include several lengthy scientific notes most of which involve vespids, including care and handling of their paper nests; the reproduction of an unknown A. Girault paper; collecting reports; and a report on the International Hymenopterists Society.

Sphecos 8 is accompanied by the long promised directory of wasp researchers, hymen lovers, frustrated bee workers, etc. Henceforth, when presenting your research and other news in future issues of Sphecos, I won't have to include your address (unless, of course, you are not in the directory).

Issue 2 of Sphecos has been reprinted (albeit poorly), and is now available to anyone that would like a copy. All other issues of Sphecos are still available also - just ask. If you joined the mailing list recently you may not have received some of the early issues.

Finally I would like to thank Vivian Wallace and Terry Nuhn for typing most of the manuscript for issue 8. Ludmila Kasianoff graciously translated some Russian titles for me, and Rebecca Friedman clarified some French.

Research News/Help Needed

Hal C. Reed (Natural Science Dept., Oral Roberts Univ., 7777 S. Lewis, Tulsa, Okla. 74171) is in a new teaching job. He says that "I have been able to initiate a few research projects. One involves attractancy of yellowjackets to heptyl butyrate in Oklahoma, and another deals with ovarian analysis of two Polybia occidentalis colonies collected in Peru. This past summer Dr. John Nelson and I collected Hymenoptera throughout Oklahoma for the Insect Museum at Oklahoma State University. In conjunction with this, we conducted a distributional study of vespid wasps within the state. We are presently collating county records for three vespine species and eight Polistes species encountered in Oklahoma. We are having difficulty distinguishing between adult females of the two red wasp species, P. perplexus and P. carolina. We can distinguish larvae and males but have trouble with the females. Any help from Sphecos readers would be greatly appreciated." [Roy Snelling where are you??]

Dr. Marcel Leclercq (rue Professeur Malvoz, B-4610 Beyne-Heusay, Belgium) is a well-known dipterist interested mainly in Tabanidae. He is also interested in social wasp and honeybee stings: their frequency, effects, and treatment. Marcel has several papers available or in preparation on these subjects. He is Prof. Jean Leclercq's brother, and is a collaborator in the Departement de Zoologie generale & Faunistique, Gembloux, of which Jean is the head. Marcel

works also in co-operation with the Departments of Physiology and of Legal Medicine of the University of Liege.

Bill Wcislo (Dept. of Entomology, Univ. of Kansas, Lawrence, Kansas 66045) is starting a review of the ontogeny of nesting aggregations, and the origins of group-living in bees and wasps, and would appreciate any reprints in those areas.

Robert S. Jacobson (Dept. of Pathology, East Carolina University, Greenville, N.C. 27834) writes: "I am working with Dr. Donald R. Hoffman on insect sting allergy. Basically, I am responsible for the collection of insects from which venom is then extracted; more correctly, the insects are made to sting and leave droplets of venom for analytical and immunological study. This project should last at least through next June, but perhaps will be renewed for another year. Bob is looking for suggestions or explanations concerning the gigantic size (relative to the female) of the male of Polistes gigas and its greatly developed head, genae, and mandibles." Do these males engage in some behaviour that is different from other species of Polistes?

Ken Guichard (14 Bolton Gardens, London SW5, England) writes: "At present I am engaged on a paper dealing with the Eumenidae of Arabia. I visited Saudi Arabia again January-February 1983, and paid another visit to the Yemen border-to Mt. Fayfa. Very rich in African species and typical of the Yemen itself. The African connection in the eumenids is fascinating and several common African species turned up for the first recorded time. But only the surface was scratched I feel. I spent beginning of April collecting around Cairo but some of the old classic localities seem to have disappeared - although a new (?) Bembix near Gisa was a surprise (male, female).

Part May and June was spent in Morocco mostly in the mountains and no accomodation problems. Lots of chrysidids which I was able to show Bohart during his recent visit to London. In a few days I go to Gambia for a fort night and hardly know what to expect right at the end of the rains - nothing perhaps unless the (your) marines turn up - good luck to them".

Roy Snelling (Natural History Museum of Los Angeles Co., 900 Exposition Blvd., Los Angeles Calif. 90007) offers the following tid bits: First of all, the Bohart Special of Pan-Pac notwithstanding, I am not, repeat NOT, reentering the field of vespid systematics. Several years ago Chris Starr had indicated a strong interest in Polistes taxonomy, and I immediately extended most heartily, my blessings and condolences, and breathed a great sigh of RELIEF! The fact that I am presently playing with Microtrimeria and (more or less) Trimeria is wholly irrelevant.

My trip to the East Coast in October was a pleasant, though hurried, break from my routine. Spent ten days at MCZ, mostly working on ants, but did look at a few polistines (nothing serious, understand). One day in Washington was hardly ample, but had to suffice. Did very much enjoy that visit and was pleased to meet some new faces: Jim Carpenter, Sandy Gingras, and Ron McGinley, as well as renewing old acquaintances. Also stopped in Athens, Ga., for one day and chatted too briefly with Bob Matthews. Then, on to Gainesville, visiting Stange, but mainly to load up the Buren ant collection, then endure the long drive home. When I crossed the Sabine River, even Texas looked good for once! Don't see how people can stand living surrounded by trees all the time, with no real horizon. Claustrophobic!

Curiosity department. A malaise trap was operated through the summer months at a moderate elevation in the San Bernardino Mts. and the catch was emptied

weekly. One result was a series of hundreds of specimens, mostly males, of Fedtschenkia anthracina (SAPYGIDAE). Although the host species of Pterocheilus was nesting, and abundant, in the field where the trap was placed, hardly any turned up in the trap. Next summer, time permitting, I'm going to try to do some work on the two species; actually, it'll be opportune since the period of greatest activity will pretty closely coincide with the period of most intense Olympic Games activity in L.A. and I had already planned on being elsewhere during the madness.

Lee Tie-sheng (Institute of Zoology, Academia Sinica, 7 Zhongguancun Lu, Haitien, Beijing, Peoples Republic of China) writes that he is studying the Vespula and Dolichovespula of China. He would greatly appreciate hearing from anyone sharing his interest.

Michael Archer (Dept. of Biology, College of Ripon & York St. John, York YO3 7EX, England) writes that he is reviewing the world species of Vespa in collaboration with Jack van der Vecht. Michael also has plans to produce a well-illustrated key to the world species and subspecies of Vespula and Dolichovespula. He proposes to circulate copies a rough draft edition to interested people for "testing" before publishing it. He will inform you of its availability in a future issue of Sphecos.

Arkady Lelej (Institute of Biology and Pedology, Far Eastern Scientific Center, Vladivostok 22, 690022 USSR) writes: I am now preparing a monograph of the Mutillidae of the USSR. Besides 170 species of our country, 90 species from adjacent regions will be include in this work. Many new species, especially in Tricholabiodes, Dentilla, and Smicromyrme, and some new genera and subgenera will be described. Not so long ago the paper on Australian Mutillidae was published. The new tribe Odontomutillini, 2 new genera (Odontomyrme, Australotilla) and 3 new species were described. The new genus and species of Myrmosinae from Burma was described in other paper (Zool. J., in press). I would appreciate receiving palaearctic and oriental specimens of Myrmosinae for study.

Tom Piek (Universiteit van Amsterdam, Farmacologisch laboratorium, Polderweg 104, 1093 KP Amsterdam, The Netherlands) says: "Currently I am editing for Academic Press a book on Venoms of Hymenoptera, with chapters on the morphology of the venom apparatus (Charles Kugler, Radford), stinging behaviour of solitary wasps (Andre Steiner, Edmonton), venoms of solitary wasps (Willem Spanjer and myself), social wasp venoms (Terumi Nakajima, Tokyo), bee venoms (Rudolph Shipolini and Barbara Banks, London), ant venoms (Justin Schmidt, Tucson), and human allergy to venoms of Hymenoptera (Justin Schmidt). Reviews on hymenopteran venoms are in press for Comprehensive Insect Physiology, Biochemistry and Pharmacology, Vol. 11, chap. 14, Ed. G. A. Kerkut and L. I. Gilbert, Pergamon, 1984; and Handbook of Natural Toxins, Ed. A. T. Tu, Volume 2, chapter 5. Marcel Dekker Inc., 1984."

Henry R. Hermann (Department of Entomology, University of Georgia, Athens, Georgia 30602) has the following papers in press: Venom apparatus manipulation and venom dispersal in formicine ants (Sociobiol.); Furcula, a major component of the hymenopterous venom apparatus (with J. T. Chao) (Inter. J. Insect Morph. & Embryol.); Nesting Biology and Defensive Behaviour in Mischocyttarus mexicanus cubicola (with J. T. Chao) (Psyche); and Elaboration and reduction in the venom apparatus of social insects (Chapter in his forthcoming book, "Defensive Mechanisms in the Social Insects," Praeger Scientific, New York). His book on defensive mechanisms should be out in early 1984. He is currently working on the venom apparatus in sphecid wasps with Al Hook, distribution of Mischocyttarus

mexicanus cubicola in the U. S. (with J. T. Chao and M. L. Manderfeld), and wing movements of defense in Polistes exclamans.

Jung Tia Chao (Department of Entomology, University of Georgia, Athens, Georgia 30602) has the following paper (with H. R. Hermann) in press in Insectes Sociaux: Spinning and external ontogenetic changes in the pupae of Polistes annularis (Hymenoptera: Vespidae: Polistinae). He is currently working on dominance behaviors in P. annularis and the venom apparatus of a species of Odontomachus.

Woj Pulawski (California Academy of Sciences, San Francisco, Calif. 94118) sent in the following status report on his revision of the North American Tachysphex. "It is hard to tell exactly how far I am with the Tachysphex project. I must be entering the final stage. The numbers of specimens examined is almost 33,200 (it was 8,600 when I left Washington, and 23,000 when I came to San Francisco). The number of species with complete descriptions is 71. This past summer I completed a key to the species. Most of the distributional maps have been redrawn in San Francisco (using 3 mm dots instead of previously used 5 mm size). What still has to be done? The unstudied specimens represent an equivalent of some 10 Schmitt boxes. I studied all of these specimens, most of them many times, and I am not able to define them as species or individual variants. The number of species still to be described is somewhere between 5 and 20. All sources of material have been used, except for the San Diego Museum (a shipment is expected, NSDA (specimens ordered), and current accumulations. The remaining material is very difficult because of lack of any prominent diagnostic characters and strong variation. The situation may not be hopeless, however: again and again progress is realized and additional species clearly defined to my own satisfaction. In the worst cases, I will simply discuss the remainder in a chapter titled Unresolved Taxonomic Problems, or something like that."

George Ferguson (Dept. of Entomology, Oregon State University, Corvallis, Ore. 97331) writes: "I am now working on a manuscript designed to define and key the North American and Caribbean species groups of Cerceris - some 18 groups including, by redefinition, two holarctic groups. Pulawski has reviewed my first draft and made many valuable comments as he knows the palaearctic Cerceris very well. My next paper will then be a key to Eucerceris, and following that, keys to the species of Cerceris on a group by group basis."

Ali Moalif (Univ. of Basrah, College of Agriculture, Dept. of Plant Protection, Basrah, Iraq) writes: "I finished my Ph.D. thesis on Euodynerus at Utah State University and returned home to Iraq. I am presently employed by the University of Basrah, 500 kms. to the south of Baghdad. During the 82, and 83 seasons, I did extensive collecting in Basrah and other citites in the southern part of the country. I will write in more detail regarding my research and collecting activities."

Justin Schmidt (Dept. of Entomology, Univ. of Arizona, Tucson, Ariz. 85721) says, "My interests in the area of defensive and survival strategies of aculeates is ongoing, albeit a bit more slowly because of constraints caused by my 'mission' which I am to fulfill for my employer (I am only an adjunct in the Department above). Nevertheless, a large contribution on harvester ants is projected to be written up soon and more work on Polistes is then slated. Perhaps of greatest interest at the moment is the study my wife Pat and I are performing relating to the comparative effectiveness of aculeate venoms vis-a-vis vertebrate predators and the evolution of venoms and venom usage in the group.

Our biggest snags at present are a lack of good sources of (large dissectable) bethylids, sapygids, or (believe it or not) sphecids. If anybody you know has any of these available or can tell me how I could get some, I'd be most appreciative."

Jeong Gie-Joon (Dept. of Biology, College of Education, Gyeongsang National University, Jinju 620, South Korea) is studying the biology of social wasps, especially Vespa, in connection with his Ph.D. program. He is also generally interested in the taxonomy of vespoid wasps in his country, and would appreciate receiving reprints dealing with any aspect of these wasps because libraries in his area have poor representation of entomological journals.

Murilo Sergio Drummond (Depto. de Biologia, Faculdade de Filosofia, Ciencias e Letras de Ribeirao Preto-U.S.P., 14.100 Ribeirao Preto-Sao Paulo, Brasil) would like to get in touch with scientists studying the biology and behavior of eumenids and stenogastrines. He is currently working on Zethus miniatus. Murilo would like to exchange papers, ideas, etc.

People in the News

Dr. R. T. Simon Thomas retired from the Pharmacological Laboratory on January 1st 1984. He will continue to work on Sphecidae (Hym.) at home to which all correspondence should then be addressed: Mythsteelaan 32, 8072 PZ Nunspeet, Netherlands.

Chris Starr writes "In late 1983 I was granted the Dennis Leston Award for my work at the Visayas State College of Agriculture. This award is named (by me, right now, for the first time) in honor of the late entomologist who was more than once, so I understand, fired by narrow-minded, inferior superiors for refusing to bend over and say Yes, sir. Although I never met Leston, I admire what I know of him and am deeply honored at this recognition that I have followed his example in at least one way."

"More soberly, it is a severe blow to me to get kicked out of a place where the bugs were so fabulous. Aside from being a bad decision, it was all done in an amateurish and contemptible manner, and I don't mind publicly expressing my disgust. My new job is in Manila (see address changes, p. 6). This is very poor for getting into the field (the nearest stenogastrines are about 50 km away) and very good for access to other kinds of information. It also allows me at long last to live with my wife, who works at the same school; a most wonderful coincidence. I teach Zoology and Entomology and assist in developing the research collections. This last duty is especially interesting, and I have a great deal of enthusiasm for it. We have no long-term plans at this point, but I definitely don't want to leave the Philippines without visiting Mindanao. It is culturally the most interesting island and biologically second only to Palawan."

Peter Landolt has been transferred to a USDA Lab in Gainesville, Florida (new address on p. 6). He says that current wasp related activities are limited to collecting Sphecidae and Vespidae.

Address Changes

David McCorquodale, Department of Zoology, Australian National University, G.P.O Box 4, Canberra, ACT, 2600, Australia.

Mr. Enrico Sismondo, 10 Garlick Ave., Singapore 1027, Republic of Singapore.

Dr. Paul Westrich, Eduard-Spranger-Str. 41, D-7400 Tuebingen, West Germany.

C. K. Starr, Biology Department, De La Salle University, P.O. Box 3819, Manila, Philippines.

T. Iida, Shinohara-honmachi 3-5-22, Nada-ku, Kobe City, Japan 657

Hal C. Reed, Natural Science Dept. Oral Roberts Univ., 7777 S. Lewis Tulsa, Oklahoma 74171.

David Legrys, Rt. 9, Box 467, Chapel Hill, North Carolina 27574.

Dr. Paul A. Opler, Editorial Office, U.S. Fish and Wildlife Service, Room 259, Aylesworth Hall, Colorado State University, Fort Collins, Colorado 80523.

Bill Wcislo, Department of Entomology, University of Kansas, Lawrence, Kansas 66045.

Peter Landolt, Insect Attractants, Behavior and Basic Biology Lab., USDA, P.O. Box 14565, Gainesville, Fla. 32604.

Robert S. Jacobson, Dept. of Pathology, School of Medicine, East Carolina Univ., Greenville, N.C. 27834.

Dr. Ali S. Moalif, University of Basrah, College of Agriculture, Department of Plant Protection, Basrah - Iraq.

Missing Person

If anyone knows the current address of Ivone R. Diniz Rocha, please let me (Menke) know.

International Hymenopterists Society, 1983 Report

About 40 members of the Hymenopterists Society met on Nov. 30, 1983, during the Annual Meeting of the Entomological Society of America in Detroit, Michigan, USA. Acting president Lubomir Masner presided. Total society membership to date is about 300 world-wide.

At the first meeting of the society in Dec., 1982 (Toronto, Canada), several committees were formed. The included a nominating committee for officers (headed by Ronald McGinley, Smithsonian Institution), Committee on Incorporation and By-Laws (headed by Henry Townes, American Entomological Institute), Committee on Fees, Dues, and Registration (headed by Henri Goulet, Biosystematics Research Institute, Ottawa), Journal (headed by Virendra Gupta, Center for Parasitic Hymenoptera, Florida), Directory of Hymenoptera Collections (headed by Paul Marsh, Systematic Entomology Laboratory, USDA), and Directory of Hymenopterists (headed by Robert Wharton, Texas A&M University). The chairmen of these committees reported at the second meeting in Detroit. Ballots for 1985 officers were mailed to the membership and the results of the ballotting will be revealed at the International Congress of Entomology in Hamburg. This information will also be sent to the members following the Entomological Society of America meetings in Dec., 1984.

At the Detroit meeting, we decided not to incorporate. Dr. Townes has drawn up a draft of a constitution which will be considered at a later date. Since we will not incorporate at the present time, there is no need for registration fees. However, it was felt that there should be some dues to cover mailing costs and society projects (such as directories). We therefore voted to have dues of US $5 starting in 1985. A bank account will be set up by the acting secretary in Texas, until a permanent home for the society can be established.

The possibilities for a journal were discussed at both the Toronto and Detroit meetings, and it was decided to postpone further discussion on this topic until the society is more firmly established. Dr. Ross Arnett is also compiling a directory of museums world-wide; and it was therefore decided to await the results of his study before compiling a directory of Hymenoptera collections.

The Directory of Hymenopterists will be started from the mailing lists of the society, and will be sent out initially as a computer print-out. Several formats are included in this mailing, and I would appreciate receiving your comments on these. The list will be up-dated for several years before a final product is ready.

The society currently has 5 regional representatives, who have kindly volunteered their services. These are Jeno Papp (Eastern Europe), Tetsusaburo Tachikawa (Far East Asia), Denis Brothers (Africa), Ian Naumann (Indo-Pacific), and Cornelius van Achterberg (Western Europe). Their duties, and the activities of the society as a whole, will be decided in detail at the International Congress, and a notice for this meeting should appear in the 3rd mailing of the Congress. At both the Toronto and Detroit meetings, emphasis was placed on the broad nature of this society. Participation by all hymenopterists is encouraged, not just taxonomists. Biologists, behaviorists, physiologists, morphologists and all the other -gists should feel that this is their society. Returns of our initial questionnaire indicate that about 90% of the 314 respondants favored the society; and about 1/2 of those responding were from the Nearctic Region (reflecting only the fact that the initial mailing list was composed largely of Nearctic workers). Of the remaining returns, most were from the Palearctic Region, with smaller representation from the remaining regions. At present, about 1/2 the society members are interested primarily in Hymenoptera biology, and the other 1/2 are primarily taxonomists.

Robert Wharton - Secretary

Arsene Girault's First Privately Published Paper

In 1979 Gordh, Menke, Dahms and Hall (Mem. Amer. Ent. Inst. 28) reproduced what was then considered a complete collection of Girault's privately published papers. However, Karl Krombein recently discovered an additional Girault paper in the Hymenoptera reprint collection at the Smithsonian Institution. This paper has been overlooked because Girault used a pseudonym, Peter Poorfellow, instead of his real name. This 1916 paper is essentially a criticism of the Peckham's 1898 book "On the instincts and habits of solitary wasps", at least those parts that discuss mud dauber (Sceliphron) biology. This paper was printed 9 months earlier than the oldest paper reprinted in Gordh, Menke, et al, 1979, and thus it is the first of Girault's many ventures into private publishing. Presumably it was printed in Washington DC. The four pages are unnumbered. It is reproduced here for all to see.

Some Sham Sights at a Muddauber

By PETER POORFELLOW

July 6, 1916

Some Sham Sights at a Muddauber

THIS idea that there is no longer any difference between man and man; and that one man's opinion is as good as another's; and that we must love each other through and through, in spite of good and bad and so much so as altogether to overloook such little things as lies and the like, not seeing them because our love must needs be blind (for if allowed to use its rather good eyes it would stir up some nasty feelings upon occasion and thus likely turn love into horrible hate); I say this idea or ideas is prevalent enough today and works such mischief as we may see. But that the select of mankind, those who are intelligent and consequently those who ought to be good or good-tending (as such evil as is in them has been discovered and uprooted or ought to have been so, wholly or in part) should often be guilty of like thought and opinion is sad indeed and one knows not what harm results therefrom. Were all the wholly wise and partly wise men all evil and took to lying and thieving one knows not what incalculable damage to mankind would result. There would be disorder of a terrible sort, no matter how smooth and unfrictioned were manners, not likely smooth and unfrictioned long thus. I say the all-wise men and some-wise men, the select and noble men of mankind, must not be all-evil; and that when one such proves evil and is detected therein, detected in lying for instance, it is the duty of other wise men, or of any man soever, to expose this liar without mercy or fear. And such a one exposed must suffer penalties in consequence.

Now no matter how well a book is written, it cannot be beautiful and of worth unless true through and through. It must be all white light. It is a sham, make-believe or thing of mere handicraft and paint, unless it is wholly constructed of truth. It has no reason for being and ought not to be tolerated but burnt to dead ashes forthwith. If this be true of all books how true particularly and especially of nature books or books scientific, books on order itself. How orderly these needs must be!

Not careless nor lying; a careless book is a lying book too and as contemptible a thing. A careless man has no business writing books, ought not to write anything, ought rather to sit very still and let such matter as is in him go up in smoke and lose itself in thick cumulus clouds or elswhere. What a benefit to mankind could we get from such, hard downpours of rain! What a blessed substitute this for careless books and line on line of shiftless words. It would make a barren thing sweet and fertile and, I say, what a blessing this would be to all mankind!

I have not lived years enough nor had the leisure to observe enough to be able to say that George W. Peckham and Elizabeth G. ditto have written an altogether careless or lying book "On the Instincts and Habits of the Solitary Wasps" (Madison, Wisconsin, 1898. Bull. No. 2, Wisconsin Geological and Natural History Survey). But what I have observed makes this likely; because it nowise agrees with what is said therein regarding those things which I have myself seen, without spectacles and out in the broad sunlight of the heavens, with no cumulus clouds about to obscure somewhat. The book has some reputation in its corner but we learn nothing from that—for so does the Champion Pugilist of the World likewise have reputation and our Bathhouse Johns', Weary Simkinses, Greatest Corn-Contest Promoters, Pancho Villas and the like famous persons. Reputation nowadays is akin to noise, is nonmusical. It is better to have none of it, to be well hidden away from it. It's a meaningless thing. Our Wasp Book gains nothing thereby—must have truth or it is a dead thing, likely enough to rot or cause decay and hence ought to be labelled at once "Poison Herein." We should say, this thing is paper printed on and that only. We must judge a book by its heart-matter and red corpuscular matter, by its rugged life matter and robust vitals. These are all that concern us. Other things therein are adventitious or else organic disease in need of surgical knifings.

This Peckhams' Wasp Book, then, let us respect it only in accordance with its vitality or truth, its real viability. It has life for us or should have such, only where harmonious and musical with truth. It is not the highest truth we may look for therein but only matter of fact, snap-sights at material bodies called insects.

Yet, these snap-sights form the warp and woof of greater truth and are not the less sinful if false. That man who tells me false little things is as contemptible as a devil; he is a diabolical man. He must be pointed at and scorned as being of Tophet; a dark man, all distended with sulphurous vapors. Not likely from such to extract luminosity!

Snap-sights at common objects can be repeated. If we snap-sight at a common muddauber wasp [the *Sceliphron cementarium* (Drury)] and preserve it in a written book, repeating this time and again and then later find that these writings agree among themselves but disagree with the writings of other persons on the same matters, notably among these other persons, these Peckhams' in a *published* Wasp Book, it is right to believe our snap-sights are true, those of others false. For we ought to believe according to our external experience in these sort of things, the more so as we are the more sensitive and intelligent and have made effort on effort, carefully and humbly, to see that which is.

Therefore, when I look at this muddauber wasp, this one and the blue one (*S. coeruleum*), a large number of times and at different places, with an humble and single look and find that the first is always building a nest and the second never doing so, what am I to think when these Peckhams' write "Almost invariably she decides to build for herself, although now and then she uses an old nest" (l. c., p. 176); the "she" referring to both kinds? I say, "This is careless and a lie withal", though very softly to myself. But, then thinking what a sin and waste it is to be careless, the heat of anger makes me want to speak out this lie. And this instinct to protest with vigor against what is wrong is right and good; it makes for health. Error sticks in our throats and strangles us; it endangers our life if tolerated. It is excrementitious matter which clogs and which must be cast off. It is opacity obstructing light.

In the chapter on the two kinds of muddauber wasps named, these Peckhams' in their printed book, run all to barrenness and opacity then, as witness:

On page 177, "She will use almost any kind of earth if only it be damp enough"; but sand is impossible of use.

On pages 178-179, "Almost all the cells that we have collected during the past six years, or, to be more exact, five hundred and forty-six nests out of five hundred and seventy-three had their openings at the top, the longitudinal axis being nearly vertical, while twenty-seven were placed horizontally, with the opening at the side. (Pl. X., figs 2-3)." Whereas, almost all the nests that I have observed during the past six years, or to be more exact, nine hundred and ninety-nine out of nine hundred and ninety-nine had their openings at the side, the longitudinal axis being nearly *horizontal* with a slight inclination to the vertical!

On page 179, "So soon as the cell is done, even if it be late in the afternoon, the wasp begins to lay in the food supply for her offspring." I have repeatedly seen a cell finished and left empty until the following day (i. e. by species *cementarium*).

On page 179 again, "In favorable weather the blue wasp often builds and stores a nest in a single day." In seven years I have never seen this kind of a muddauber carrying mud or at home anywhere though in great abundance around the nests of the larger and variegated kind. It is a cowbird wasp. How doctors disagree when fools among them be!

On page 187, "Our wasps did not show the habit of those observed in France, in laying the egg upon the first spider placed in the cell. Indeed we found that it was only after the nest was completely provisioned that the egg was laid on the abdomen of one of the last spiders brought in." A contrary and perverse statement of what occurs, astonishing for these days but not unlike what Machiavelli relates of a certain notorious Pope Alexander of remote and darker ones.

A contrary and perverse chapter, ye Peckhams'; and if so why not a contrary and perverse book of chapters? Careless and therefore wicked. Mayhap, intentionally base, thus criminally wicked. All I can say is that thy chapter XIV had better not have been written, ye Peckhams. It has likely led thee to Tophet and will not be profitable to thy memories or elsewise. If thy whole book be false like thy printed chapter of it, who knows if mankind is not incalculably harmed and polluted thereby?

THE END.

SYMPHYTOS - a new newsletter

The first issue of Symphytos (34 pages) appeared in February, 1984. It is edited by David Smith of the Systematic Entomology Laboratory, USDA, c/o U.S. National Museum, Washington DC 20560 and Henri Goulet of the Biosystematics Research Institute, Ottawa, Canada K1A OC6. This newsletter is designed to keep sawfly workers around the world informed of research, travel, collections, etc. The format is similar to Sphecos. Congratulations to Henri and Dave for this effort!

The Hymenoptera Research Unit of the U.S. Department of Agriculture (Eric Grissell, Paul Marsh, Arnold Menke (leader), Mike Schauff and Dave Smith) now produces three different newsletters: Sphecos (Menke edit.), Chalcid Forum (Grissell, Schauff and Gibson edits.), and Symphytos. Now we need someone to initiate newsletters for bee workers, ant workers, and cynipoid workers. These are the remaining areas in Hymenoptera that are without this kind of support. Any volunteers out there?? Does anyone know if Ichnews (for ichneumonoid workers) is still alive?

Specialist Meetings?

Justin Schmidt (Dept. of Entomology, Univ. of Arizona, Tucson, Ariz. 85721) would like to organize meetings of people interested in getting together to discuss their specialty - that is, for example, workers in mutillids, tiphiids, and other groups. He would like to hear from anyone interested in getting together informally at the next annual meeting of the Entomological Society of America which is in San Antonio, Texas, in 1984. [There will be a meeting of the International Hymenopterists Society at the ESA meetings in San Antonio - thus it should be fairly easy to work out the kind of get together that Justin is proposing - editor].

Hornet Poster - English Edition

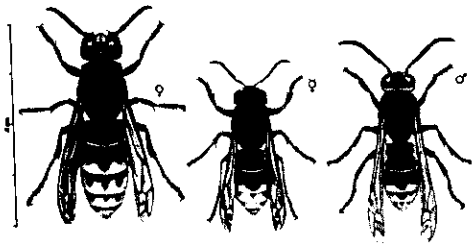
In Sphecos 7:7 I announced the availability of a fine, large, full color poster depicting the life history of Vespa crabro. Helmar Kulike, who designed and produced it, will soon make available an English edition. She is anxious to find buyers of course, but more importantly she would like to find firms or people in the United States, Canada, and England that would be interested in selling and distributing it for her. The accompanying black and white reproduction shows what the poster looks like, but of course does not do justice to the beautiful color of the original. Helmar has suggested a retail price of 5 dollars, U.S., for the English version. One U.S. firm, Bio Quip Products, P.O. Box 61, Santa Monica, Calif. 90406, has agreed to sell the poster on a trial basis. Posters will be sent in mailing tubes and Bio Quip will charge $1.75 for mailing and handling to addresses in the U.S. For people outside the U.S. the mailing and handling charge will be $2.75. Payment in U.S. dollars should be included with orders sent to Bio Quip. California orders should include the 6%-6 1/2% tax.

[Those interested in getting the poster from Bio Quip should write first to see when they will be available because, as this is being written - May 11, 1984, negotiations are still in progress between Kulike and Bio Quip over distribution of the poster -- Editor.]

Those wishing to write to Helmar directly can reach her at the following address: Freie Universitat Berlin, Fachbereich Biologie (23), Institut fur Allgemeine Zoologie (WE 4), Konigin-Luise-Strasse 1-3, D-1000 Berlin 33, West Germany.

HORNETS

Vespa crabro

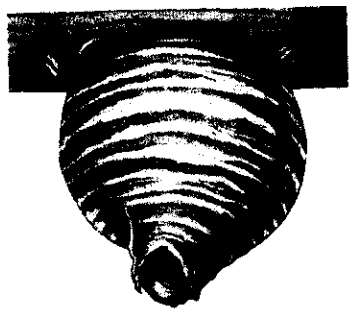


"Queen" (Foundress of the nest)

"Worker" (Infertile female)

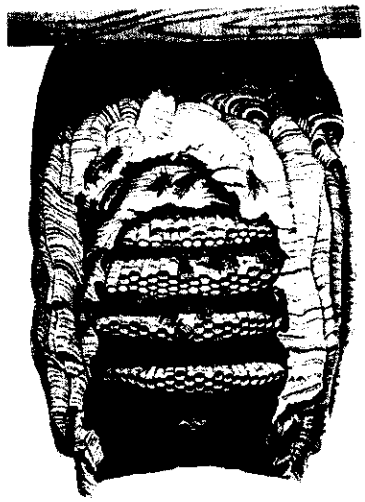
Male (No sting, longer antennae)

The life cycle of a hornet colony starts in the spring with the foundation of a nest by a "queen" which mated in the previous autumn. She builds a small comb of hexagonal cells and raises in it the first "workers".

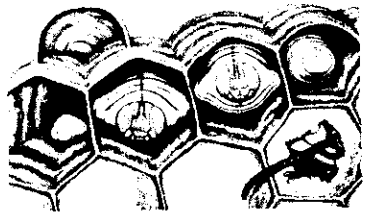


A protective envelope surrounds the comb in order to regulate both temperature and moisture in the nest.

Hornets construct the combs and the envelope of their nest with finely chewed wood which has been moistened with saliva. Because of this processing the material is soft and easy to work, and soon dries to a thin paper-like sheet.



Only a few hornet colonies are able to construct a large nest of the size shown here, because large natural nesting sites have become very rare. Healthy colonies consist of hundreds of "workers" who raise many sexual offspring (males and females)



New cells are built on the edge of the comb and contain one egg each. These eggs take about 5 days to develop into larvae, which in turn take another 12 to 18 days until they weave their cocoons. The following pupation phase lasts 13 to 15 days and during this time eyes, wings, antennae and the other organs of the mature hornet develop. Without assistance, the emerging insect cuts itself free from its silken cocoon. Males and young "queens" are not produced until late summer.

Night and day, hornets catch living insects to feed to their young. (The picture shows a "worker" hornet chewing a wasp.) Hornets are not aggressive towards other animals and humans, but rather cautious and ready to escape. Only in the direct nesting area do they defend themselves against intruders.

Only the future "queens" hibernate in decaying trees or in the ground. The old "queen", all the "workers" and the males die in the autumn.

Sap from trees and juice from windfalls are the main sources of carbohydrates for adult hornets

Hornets copulate outside their nest and join in the typical S-shaped position shown. Usually both sexes mate with more than one partner.

Danger from hornets

Hornet stings are no more dangerous than the stings of wasps, bumble bees and honey bees. Even many stings at the same time are not dangerous to most people. The exception is for those persons who show a strong allergic response to the venom of these animals, and in these few cases, only one sting can produce anaphylactic shock. Fortunately, such allergies are very rare. The normal pain and swelling after a sting are often wrongly considered to be allergic reactions.

Protection of hornets

Hornets and their nests should be left in peace. Even around houses, hornet colonies can remain without constituting a danger to the inhabitants. The threatening decline of hornet populations is solely caused by man. It is an example of the destruction of the natural balance of species and thus shows how we endanger the world in which we live.

c/o Institut für Allgemeine Zoologie, Königin-Luise-Straße 1–3, D 1000 Berlin 33

Notes on George Arnold, African Hymenopterist

A recent issue of the newsletter published by the Association of Systematics Collections (ASC Newsletter 11(4) - 1983) contained an interesting article on the history of the National Museum of Zimbabwe (formerly Rhodesia). In it were the following notes on George Arnold: "The establishment of the insect collections began in 1911, with the appointment of George Arnold as Curator of the Museum. He built up a superb collection of African Hymenoptera and the Department was noted for research on this group until Dr. Arnold's death. The bulk of the Hymenoptera collection, including over 900 primary types, was transferred to the South African Museum, Cape Town, at the beginning of 1981, as part of an exchange agreement (see Sphecos 5:8). In addition to his specialist knowledge in the field of entomology, Dr. Arnold was interested in other aspects of natural history. He was a fine technician and some of his hand-painted plaster casts of reptiles and amphibians are still on public display. With the nationalisation of the Museum in 1936, Dr. Arnold became Director of the National Museum and Director of Museums. Dr. Arnold remained in office until 1947, when he stepped down, continuing as Honorary Keeper of Entomology until his death in 1962."

Announcement

Jean Leclercq, Zoologie generale and Faunistique, Faculte des Sciences Agronomiques, B 5800, Gembloux, Belgium, writes: "I will not attend the XVIIth International Congress of Entomology in Hamburg, August 1984, because it has been decided that English will be the only language of the Congress. The exclusion of French and German, which apparently do not merit as languages for international communication in science, and surely not within continental Europe, is much resented by French speaking entomologists. Notwithstanding, Prof. Leclercq and his staff in Gembloux would welcome with pleasure foreign entomologists returning from Hamburg in September or October, 1984." [It is indeed unfortunate that these feelings will prevent some entomologists from participating in the Congress. Surely there will be plenty of conversations among participants in French, German and other languages in spite of the "official" language. Isn't science more important than politics? -- Editor].

Boondocks

Chris Starr sends the following lumination: "Boondocks" is derived from a Philippine word. Bundok is one of the Philippine words for mountain, hence its connotation in English of "off in the hills".

Vespula vulgaris in New Zealand

Barry Donovan (Entomology Division, Department of Scientific and Industrial Research, Lincoln, Private Bag, Christchurch, New Zealand) writes: "On 3 February 1983 when in the southern city of Dunedin to attend the 15th Pacific Science Congress, I noticed a worker Vespula buzzing in a tree gutter. The only Vespula species known to be established in New Zealand was V. germanica, but this specimen seemed much darker. Microscopic inspection of the worker indicated that it belonged to V. vulgaris. However, during a survey of the immediate area within the next week only V. germanica was recorded."

"Zoology students at Otago Unversity (which is situated in Dunedin) are required to make an insect collection, and on 18 March a student, Mr. N. O'Brien, brought in a small wasp nest which local entomologists recognised as belonging to V. vulgaris. Subsequent inspections of student insect collections for the previous year showed that V. vulgaris had been captured in early December. In April 1983, 5 further nests were discovered, all of which were producing large numbers of drones and queens. Cell counts of 4 of these nests showed that the average number of small cells was 7,767, and large cells 4,796."

"An examination of wasps from New Zealand insect collections showed that a V. vulgaris worker was captured on 13 February 1981 at Lower Hutt which is at the southern extremity of the North Island near Wellington. Mr. K. Bateman, of Victoria University, Wellington stated early this year that he had collected a number of queens and nests of V. vulgaris 'for at least one season' [see also Sphecos 7:7]. So V. vulgaris is firmly established in both major islands of New Zealand. Its distribution on offshore islands is not known. Of much interest will be the rate of colonisation of other areas and the effects this may have on population levels of V. germanica."

"The German wasp reaches very high numbers of both nests and individuals here annually in the absence of competing wasp species. The question now is whether the "Common Wasp", V. vulgaris, will displace V. germanica or become more common than the German wasp without reducing population levels of the latter".

"The advent of V. vulgaris will probably enhance our attempts to establish Sphecophaga vesparum which was imported initially for attempted biological control of the German wasp. The next several years should be particularly interesting."

Barry subsequently sent the following addendum: "On 13 January 1984 a worker Vespula vulgaris was captured in the city of Christchurch. Thiw was the first record of this wasp species in Christchurch: nests and wasps collected throughout the city from 1979 had all been V. germanica. By late January 1984 at least a dozen wasps nests had been located and/or excavated. Only one was V. germanica."

"Workers of V. vulgaris were abundant locally on damaged plums both on trees and on the ground beneath trees, and were scavenging around compost heaps. Several people had been stung. As nests should continue to enlarge through March, the incidence of fruit attack etc., can be expected to increase."

Vespula germanica in Idaho

MacDonald & Akre (1984, Ent. News 95:5) recorded this wasp in sw. Idaho (Nampa). Identification was based on material collected in Oct. 1981.

Social Wasps in Chile

Mary Jane West-Eberhard (Escuela de Biologia, Universidad de Costa Rica, Ciudad Universitaria, Costa Rica) sends the following note: While in Caracas recently (October) lecturing in a course on social insects at the Instituto para Estudios Avenzados, I learned for the first time that Chile, a country that in the past has been remarkable in lacking social wasps, has in recent years been invaded by several species of Polistes and one of Vespula. A Chilean participant in the course, Raimudo Charlin C., reports that the "invasion" of wasps began about ten years ago, via a road crossing the mountains from Argentina. The wasps have recently become much more common, and are considered pests of fruit orchards, where they hinder harvesting and make holes in fruit enhancing the growth of fungi. From Charlin's report I had the impression that the wasp problem in Chile is made more serious by the fact that Chilean farm workers are unusually worried by the wasps because they are not accustomed to dealing with them.

Scientific Notes

SOME OBSERVATIONS ON VESPA AND OTHER SOCIAL WASPS IN TAIWAN

by
Robert Jacobson
(Dept. of Pathology, East Carolina University, Greenville, NC 27834)

During a trip to Taiwan (28 October-14 November 1981), I had the opportunity to observe several species of Vespa and other social wasps, and I believe that some of these might be of interest to other readers of Sphecos.

Most of the Vespa species were observed visiting camellia trees in Wushe, Nantou County, which is in the mountainous center of Taiwan, at over 1000 m elevation. V. mandarinia nobilis, tropica pseudosoror, velutina flavitarsus, and analis nigrans were all present at the same group of trees. The most abundant species was V. velutina, which appeared to be distinctly more agile than the other species; its flight was similar to the Dolichovespula species. Vespa mandarinia flew in a manner similar to V. crabro, which will be familiar to more readers. The workers of V. mandarinia exhibited some antagonism toward each other upon some encounters; they would "grapple" somewhat upon meeting each other, sometimes while in the air. However, none were seen to actually "lock" together. One specimen was crawling on the ground missing forewing and having a broken hindwing, while others had the tips of antennal flagella missing; these could be the results of such encounters.

Vespa tropica flew more slowly than V. mandarinia; its flight reminded me of Polistes species such as P. annularis. A few males of V. tropica and mandarinia were collected in addition to the workers while only workers were encountered for the other Vespa species. Only one specimen of V. analis was collected. One male of Parapolybia was collected in Wushe; this was darting along vegetation.

In Lushan, several km east of Wushe, but of similar elevation, additional species were encountered. Camellia trees were blooming here, and several V. basalis and V. velutina workers were collected (but only one worker of mandarinia). However, many local shops sold assorted dried fruit, seeds, teas, etc., and V. velutina and basalis were attracted to these somewhat, but several workers of Paravespula flaviceps karenkona were seeking sweet juices from these, while one was observed catching a muscid fly. Because of the very thin yellowish bands, giving P. fl. karenkona a dark appearance, and the small size (at least compared to Vespa species), some people watching me collect them wondered why I was collecting "flies". Otherwise, its flight was similar to that of such species as P. vulgaris or maculifrons when scavenging. Unfortunately, no Vespula orbata arisana was collected in either location, but this was not surprising considering its relative scarcity.

A couple abandoned Polistes nests were collected from tree twigs in Lushan; although these resemble nests of the Nearctic species P. exclamans, the species has yet to be determined. A female Parapolybia was collected at a poinsettia blossom.

Many dried Vespa nests were observed hanging in shops in Lushan, and some of these could be identified as V. velutina while others were lacking envelopes, making it more difficult to determine the species. In one store were bottles of "wine" made with V. velutina; some had adults while others had only pupae. I was able to obtain a dried mature nest of V. velutina and another that was less mature; these were air mailed to the U. S. (see article on preserving and shipping--the precautions are based upon the result of shipping the large nest).

In Taichung, a few tiny colonies of Ropalidia were collected in bushes on the National Chung-Hsing University campus. (As these were the only live wasp colonies collected during my visit, I felt somewhat foolish having brought all my protective clothing, but I always take it with me when I travel.) These nests had been located by Mr. Hsiao-sheng Liu of the Department of Entomology of the University (now he is at Texas Tech University). Mr. Liu accompanied me to Lushan and helped in numerous other ways to make this a successful trip. While in Taichung I had an opportunity to meet Dr. T. C. Maa (at Tunghai University); Dr. Maa had collected extensively in Fukien Province many years ago and had published on the Vespinae of China. Much of Dr. Maa's collection is in the Bishop Museum in Honolulu.

In Tienmou (a northern "suburb" of Taipei), Vespa affinis was collected from small (unidentified) blossoms. This species is rather slow flying, much like V. tropica.

In Yangmingshan Park (near Taipei), many more V. velutina workers were collected on camellias and on another tree with tiny compound blossoms. What appeared to be a female of Polistes gigas was seen, but could not be collected. Two males of V. tropica were collected on the camellias.

During my stay in Taiwan, I had an opportunity to examine the collections of National Chung-Hsing University, National Taiwan University, the Taiwan Provincial Museum, and the Taiwan Agricultural Research Institute. The last mentioned had recently undertaken a very ambitious collection program for a faunistic study of Taiwan; in their extensive undetermined material were workers of Vespula orbata arisana from both Wushe and Kukuan (Taichung County).

In order to obtain a greater "feel" for the Vespa species, I tried to estimate the frequency of the wing beats of the flying insects. This was done by determining the approximate pitch of their buzz. It was no surprise that the most agile species had the highest pitch. My estimates are 125, 95, 80, and 80 for V. velutina, mandarinia, tropica, and affinis, respectively. (In order to put these into perspective, I would give estimates of 275, 165, 110,

and 60 for Apis mellifera, Vespula maculifrons, Vespa crabro, and Polistes annularis, respectively.)

Two additional comments concerning Vespa mandarinia nobilis: 1) In flight, the orange head and sixth tergite could be seen very distinctly from several feet away; 2) Netted workers of V. mandarinia almost always "clicked" with their mandibles, the sound resembling that which can be made with one's thumbnail against the nail of his index finger.

I wish to express thanks to Seiki Yamane for his suggestions while I was planning this trip.

WASP STUDIES AMONG THE KAYAPÓ INDIANS OF BRAZIL

by
William L. Overal
(Museu Paraense Emilio Goeldi, Belém, Pará, Brazil)

From the time of my arrival in the Amazon in 1976, I have been impressed by the diversity of social wasps and by their behavior. Folks from the Amazon, by contrast, are not overly curious about their rich fauna of vespids and are likely to exaggerate the ferocity of the wasp's attack and the pain of their stings. Only recently did I find a village of fellow wasp-lovers in the Amazon and meet one of the most knowledgable hymenopterists I know.

In April and May of 1983, I accompanied Darrell Posey, entomologist turned anthropologist, on a visit to the village of Gorotire in the south of the Brazilian state of Pará. This is the largest village of the Kayapó, one of the major remaining tribes in Amazônia. Their reputation for vigorous defence of their lands caused them to be left alone until 1938, when missionaries established permanent contact. In the village, Darrell, who is fluent in their language, works with several of the more knowledgable Kayapó, two of whom speak Portugese. I was just another specialist (and de facto representatives of Western science since Darrell often appeared to side with the Indians). Darrell and I spoke English when discussing an informant's contribution.

Our objective was to test the hypothesis, often assumed in studies of this sort, that the Indians have appreciable information about those animal species which enter into their economy, mythology or medicine and that, conversely, species which hold no value in these respects are ignored.

Our methodology was simple, yet straightforward. For each folk speces of social wasps, we obtained generally accepted common names in Kayapó, (consulting at least four informants in order to avoid writing the Kayapó equivalent of "I don't know" as a name), medicinal and ritual uses, information on habitat selection, nest structure, nest founding, active foraging period, defensive behavior, social organization, natural enemies, related species, and relationships to ants or birds. We generally collected wasps in the company of Indians who many times could take us directly to a requested species. Specimens and notes were taken with identifying to folk species and a lengthly vocabulary was compiled for the terms which relate to wasp morphology and to the structure of wasp nests, in an attempt to determine the etymological relations of wasps.

Gorotire is an excellent collecting locality, perhaps even more favorable to vespids than the site of the Royal Society's 1968 expedition to Mato Grosso. Several types of forest and non-forest vegetation are represented near the village, and the savannas and forests, even a short distance from the village, are undisturbed and waiting for the biologist. In four weeks we collected or saw the nests of 42 species of Polybini and 9 Polistes species. We were, moreover, continually told of species which we had not taken and needed to be sought in habitats other of the locality and of the kayapó culture, our visit was too short

and plans for an eventual return visit are underway.

The Indians were, as is natural, impressed to hear the Latin names for the wasp species were collected, but Western science from that point fell short when it came to telling what the wasps do or for what they could be used. In the Kayapó taxonomy, some 58 names are available for wasp "species", although the application of these names is not completely uniform, and several are synonyms. This was the case found where names are based on different distinctive traits of a species, such as nest architecture and body coloration. Higher groups of wasps, which would resemble genera, are unnamed categories based on nest architecture permitting the Polistini and Polybinii to be separated (with the genus Michocytarrus placed on the "wrong" side of the dividing line). Stelopolybia, due to its vertical combs, is another group recognized by the Kayapó system, as is Apoica with its "inverted basket" nest. Morphological characters were not utilized to any extent, in spite of the fact that the terms for the parts of the body are also those applied to humans.

All social wasps belong to the named group "amuh" which was, however, also cited for aggregations of Rembicini and Eumenidae. Above "amuh" in the heirarchy is the group "ñy" composed of Isoptera and Hymenoptera, especially the social insects, "mrum" or ants, "rorot" or termites, and "mehn" or bees. Large bees (Xylocopa, Anthophora, Bombus, etc.) are placed in the group "kungont" which is usually identified as allied to, if not part of, the "mehn". A species that presented some problems to Kayapó taxonomists (and one which exemplifies the taxonomic criteria utilized) is Brachygastra lecheguana, a honey-producing wasp whose nests are raided in the manner of those of stingless bees. This wasp is often referred to as "mehnkumamuh:, a hybrid classification between wasps and bees. Its Kayapó name "amuh ti" places this species among the wasps and, in a certain fashion, makes it the type species for the "amuh". The word "ti" means big or important. No doubt, this honey-producing wasp is important to the Kayapó.

The appearance of another stinging honey-producer, africanized Apis mellifera, in 1973 or 1974, was another trial for the Kayapó taxonomist who nonetheless was able to assign this species, "ngài-pêrê-y", to the "mehn" while applied entomologists adapted the technology available for the raiding of "amuh ti" nests to the task of stealing Apis honey.

Social wasps play an important role in the Kayapó pharmacology. Stings are generally considered to be beneficial, even if painful, and are recommended in the treatment of "bone" diseases. This is strongly suggestive of European folklore among honey-bee keepers or of the general belief in "tachi" ants (Pseudomyrmex spp.) as cures for swollen or stiff joints among Amazonian Indians. The honey of Brachygastra, although if falls into the male monopoly on honey, was not mentioned to me as being medicinal. Pregnant women do not eat honey, as a rule, but the reason for this is not clear.

Body painting is an art among the Kayapó, and it may be that art follows nature. Common designs among men were strongly suggestive of patterns on the sand wasp Stictia signata and those on Polybia liliacea. When Darrell and I asked about this resemblance, we obtained immediate confirmation of our idea. Given the Indians desire to please their entomological visitor, I am still uneasy about my lack of circumspection in asking leading questions. The body painting does, however, remind me of the wasps.

Wasps are associated with courage and valiant attack among the Kayapó. Stories were told to us of wasps attacking other nests in the early hours of the morning. Whereas I can confirm that many wasps begin their day when the Indians do theirs, at 04:00 AM, I have never seen raids such as were described by our informants. Perhaps more important is that wasps serve as a model for the Kayapo warrier who attacks with total abandon at dawn. In the face of such admiration for stinging swarns, I could not bring myself to mention the gender of the stinging wasp: Kayapó society is still male-dominated.

To gain the wasps courage, Kayapó men are stung in rituals which mark their passage from one age group to another or which commemorate the coming birth their child. During our stay in the village, no "fighting of the wasps" took place, but we were able to interview many participants of these battles and several spectators. During the night, scaffolding is erected in a tree to within a meter of a large wasp nest, and the participants prepare themselves for their ordeal with dancing and festivity. In the early morning, the men who will be stung climb the scaffolding in pairs and pommel the nest with their hands. The result is generally conceeded to be many stings, especially for the second and third pairs to take their turns.

With Darrell Posey, I saw the remains of a battered nest which had been so abused some days before our visit. There were only a few wasps in the nest and these had most likely pupated recently. The species was Polybia liliacea whose nests are among the largest in the Amazon, reaching over 1.5 mm in length and 50 cm in diameter. Our constant questions on the "fighting of wasps" elicited much information, not all of it consistant, as to the species which are fought. From repeated interviews, we concluded that several species might be used, althought a preference for Polybia liliacea ("krã já nê tire"), Polybia rejecta ("krã já nêre"), and Synoeca surinama ("apiêti") does exist.

Whereas we conceed that social wasps have a long evolutionary history, they were here at the creation of this world, according to informed sources in Gorotire. A story which bears repeating is that the first Kayapó to come to Earth did so by sliding down a vine from the sky. The vine, which may be the rotonone vine used as a fish poison, is where the wasp makes its nest, guarding the return to the sky where the campfires of the old Kayapó are the bright points of light seen at night. The "kuban" or non-Kayapó came up through a termite mound (most likely Cornitermes sp.) from a lower level. The number of levels above and below us is undetermined, but the model is clear: The universe is organized like a wasp nest, particularly a phragmocyttarous one such as made by Brachygastra, Polybia, Chartergus or Epipona with parallel horizontal combs. This world is but one comb in such a structure. The wasp nest motif is repeated in the ceremonial hat of Kayapó shamans, a representations of the cosmos.

Kayapó, when they lived in the sky, did not form villages and were not strong. That they now are organized into societies and are strong is due to the help they obtained from wasps. The chief of a wasp nest is called the "benadjwàre", just as is the chief of the village. The "benadjwàre" of a Melipona colony was pointed out to me, as were those of termite and ant colonies. The concept is undoubtably that of the queen of the colony, although this caste is generally difficult to pick out visually among polybiines. The Kayapó, so our informants insists, are socially organized like the social wasps with their chiefs. They learned to live in villages by observing the wasps and are strong like the wasps. Non-Kayapó are weak, probably due to their having been associated with cowardly termites in coming to this level.

Among the people who most help us was Kwyrà Kà, who is as keen a naturalist as any I have met. In the matter of wasps and insects in general, Kwyrà is the specialist of Gorotire. He is unrivaled among the men of his own age for his knowledge, aquired over a life-time of daily contact with the animals of the savannas and forests, and he carries on a verbal tradition of long-standing among his people. Although he is in his 60's, he energetically climbed trees to collect wasp and bee nests for our inspection and took us into the forest to show us different species.

Young folks at Gorotire, however, are not following on in Kwyrà Kà's footsteps. These are not the times to permit one the luxury of profound study on largely non-economic subjects. Men and boys are involved in gold-mining, making handicrafts for sale, earning money for clothes and travel, buying of radios and

tape recorders, and other non-traditional activities. During my visit current pressured on the village were well shown by the lack of participants for a ceremony marking the opening of new swadden fields. Most of the village's men were at the gold mine, even leaving Brazil nuts ungathered on the ground.

No one can not tell who will take over from Kwyrà Kà, but I fear that thousands of years of accumulated knowledge on wasps and other social insects may soon be lost. Who will there be in the future to answer patiently our questions on the "friendship" of Polybia rejecta with the Yellow-Rumped Cacique or two explain the messages tapped out by Synoeca virginea? We will all be poorer with the acculturation of this and other Amazonian Indian tribes, and we will perhaps never know the zoological lore held by these peoples.

The Kayapó are keen observers of nature and the possesors of extensive knowledge on social Hymenoptera. The obvious contrast, that of comparing the Indians with the rural inhabitants of the Amazon, seems hardly fair. One Indian village has as many common names for social wasps as does the all the rest of Brazil. More folk-remedies based on wasps were recorded here in Gorotire than anywhere else in Brazil, and the information, both detailed and verified, on social wasp behavior which we obtained from the Kayapó is unmatched among any other folk group yet researched. The Kayapó hold wasps in special esteem as totem animals and respect them as fellow inhabitants of their lands.

For those readers who would like additional information on Kayapó wasp studies, let me recommend:

Posey, D. A. 1981. Wasps, warriors, and fearless men: The cultural ecology of the Kayapó Indians of central Brazil. J. Ethnobiol. 1(1):165-174.

_____, 1982. The importance of stingless bees to the Kayapó Indians of the Brazilian Amazon. Florida Ent. 65(4):452-458.

_____, 1983. Ethnomethodology as an emic guide to cultural systems: The case of the insects and the Kayapó Indians of Amazonia. Rev. Brasil. Zool. 1(3):135-144.

ON THE USEFULNESS OF NEST SERIES IN COLLECTING SOCIAL INSECTS

by

C. K. Starr

(De la Salle University, Manila, Philippines)

INTRODUCTION

We are all aware that social insects are different from solitary insects. Not everyone sees, though, that the business of collecting social insects must also be a different operation from collecting solitary species. There are several good books available on collecting and curating insects (e.g. Beirne 1955, Martin (ed.) 1977, Oldroyd 1958), entomology textbooks which treat of such techniques (e.g. Borror et al. 1981, Elzinga 1978) and books on social insects which do the same (e.g. Wheeler 1910, Spradbery 1973). Yet none, as far as I know, considers the collecting of social insects as such. This is part of a larger deficiency in books treating of collecting insects. Little attention is given to the importance of collecting in an information-rich fashion, i.e. so that a large fraction of specimens bear more information than the minimal locality-date-collector.

The following remarks are applicable only to insects collected as part of a social group, so that they are irrelevant to individually-collected foragers or alates at lights. The most important additional information which can commonly accompany a social-insect specimen is a correlation with other specimens from the same nest. Sociality provides a valuable opportunity, which seems almost always

to be missed. In collections of pinned social hymenoptera, it is rare to fine any indication of which specimens are from the same nest, let alone a correlation with specimens kept separately in alcohol. Yet the value of matching up nestmates, especially of different phena, is obvious. When we find a long series of apparently identical specimens with identical locality labels, we tend to assume that they come from a single nest. A good assumption, but no substitute for certainty. Besides, nestmate-matching is most valuable when it is least obvious, e.g. with the males and female of army ants. One measure, mentioned by Wheeler (1910) for ants, is to keep nestmates together in a single vial. This is only a very limited measure, which offers no solution to at least 5 problems.

1. At least some of the specimens should commonly be pinned for examination. How to store the information that these belong with each other and with those left in the vial?
2. Part of the series may be sent to another collection. It may or may not then return.
3. Not all stages should be kept together.
4. Nests can usually not be kept in vials.
5. Field notes and photos of the colony should certainly not be kept in vials with the specimens. Yet it is essential that they be linked somehow.

My purpose here is describe the very simple method I have come to adopt, which solves each of these problems, and to discuss the use of such a method.

DESCRIPTION

All specimens from a single social-insect nest are given a unique nest series number at the time the series is locality-labelled. This number then applies to all castes and stages, as well as symbionts and the nest itself, but never to any specimen not associated with that nest. I find it most convenient to add "Nest series no._____" at the end of the locality lable.

In addition, I keep a set of 2 nest-series notebooks, containing identical information. Beside each number are recorded the locality, date, what forms (castes, stages, symbionts, the nest) were collected, taxonomic determination, and remarks. I often put in a tentative determination as the information is entered, but this can be changed later. Determinations in the notebooks are always informal. Remarks commonly include habitat, whether the series comprises much or all of the colony, which other collection has received specimens from this nest. As an example, Table 1 shows 3 lines from the notebook in fascimile. What these indicate about nest series no. 458, beyond the standard minimum, is that it includes adults (no information about caste), larvae and puape, but no symbionts or the nest; that I have notes about this particular colony in other notebooks; and that a sample has been sent to the Natural History Museum of Los Angeles County. Of series 459 I have only workers, it is an Odontomachus, nesting under a log, a sample also sent to the LA County Museum. Series 460 is a Trigona sp., I have the queen, some workers and symbionts, notes on this colony, and the queen is in Dietrich's-Kahle's solution, in case her ovaries should be dissected.

Table 1. Sample of entries in the nest-series notebooks

Nest series number	Locality	Date	Adults	Larvae	Pupae	Nest	Symbionts	Determinat'n	Remarks
458	Phils; ViSCA, Baybay, Leyte	28.IX.1982	X	X	X				N; common red formicine; spns to LA
459	"	"	♀♀					Odontomachus	under log; spns to LA
460	"	"	♀♀♀ ♯♂♂				X	Trigona	N; queen preserved separately in Dietrich's sol'n

The first of the 2 notebooks is looseleaf, in which I write down everything in my own shorthand, not necessarily legible to anyone else. I take unfilled pages of this along on collecting trips and enter the new nest series as I write up labels and field notes. The other is a bound volume, into which all new nest series information is neatly copied in permanent ink. This notebook is never taken into the field, is intended to be legible to others, and will someday be deposited in a major museum.

DISCUSSION

The assignment of nest series numbers solves the problems listed above in a convenient way. It requires very little labor for the amount of useful information stored. No matter how the series is subsequently dispersed, the information is not then lost (though retrieval is not always easy).

Treatment of nest series allows some other practical advantages which may not at first be obvious. I'll mention 3 of these.

1. In sending specimens for identification it is often feasible (and mutually satisfactory) that those specimens not be returned. If only a sample of the nest series is sent and the rest kept, the receiving taxonomist needs only to communicate the determination, and that determination can confidently be given to the rest of the series.
2. In describing new species or subspecies of social insects, the nest series numbers should be given. Other members of those series which the describer did not see are then effectively paratypes. I note that they have no such status under the ICZN, but the logic of this view seems clear.
3. Similarly, if the nest series numbers of voucher speimens are given all others from those series will also serve as vouchers.

Each of these assumes that where 2 or more species occupy a nest they are sufficiently distinct to us that confusion cannot arise. I know of no case where this assumption fails.

Let us now deal with 2 minor problems which commonly arise in the use of nest series.

1. If there might be a question of whose series-system is involved, this should be made explicit. It often happens that someone else collects a colony of social insects for me, so that my name would not normally appear on the locality label. In that case I designate the series as "Starr nest series

no.____". But if I am the first or only collector listed I let it be assumed that the series number is mine, hence just "Nest series no.____". It may sometimes be desirable that a series system should relate to a collection, not a collector. I am considering beginning such a system here, in which case each series would be designated "DLSU nest series no.__ _".

2. The set of nest inhabitants and the set of colony members are often not equivalent. It is not desirable to have a general convention of what consititutes a nest series, as this is partly dependent on one's particular research interests. Flexibility in this matter can lead to better information-content of the series-series. I myself often deal with polydomous species (i.e. those with several nest/colony) and infrequently with nest-symbiotic social insects, so that I usually prefer to make the nest the focus of the series system, rather than the colony. The main exception to this tendency concerns group-foraging ants and termites. Knowing what we do about these, and bearing in mind the uses that nest series are intended to serve, it makes sense to treat members of a foraging column as a nest series.

While the logic of nest series is most applicable to social insects, there are cases where it is usuful to apply it to solitary species as well. This may occur when there is an abundance or diversity of material closely associated with a paraticular nest. Mud-nesting solitary wasps, for example, sometimes construct multi-cell nests from which we may take wasps of various stages, prey, and parasites, in addition to the nest itself. It may then be more practical to treat this "colony" with the methods developed for social insects.

There is any number of other situations in which it can occasionally be useful to assign unique numbers to series of specimens. In collecting social insects it is almost always useful to do so. I have no doubt that other social-insect biologists have independently developed systems similar to mine, and in many cases improvements on it. Yet, I have never yet seen them mentioned in the literature. One purpose in writing this to encourage discussion on how to collect social insects in an information-rich way.

ACKNOWLEDGEMENTS

I am grateful to David Kistner and Charles Michener for suggestions. Dave uses a method similar to mine; his research is on nest symbionts of ants and termites, and he keeps two separate series-systems for the two.

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PRESERVING AND SHIPPING OF PAPER NESTS

by
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Paper nests not only serve as artifacts revealing the history of individual colonies, but yield valuable information concerning behavioural characteristics and phylogentic insight into the species that build them. Of course, many have aesthetic qualities and all provide an appreciation for the abilities of their makers, thus adding a new dimension to collections of the insects themselves. Furthermore, the nests of some species have never been studied.

Because of the efforts required in collecting, the work in preparation, especially for an active nest, and the space required for storage, relatively few museums attempt to maintain a collection of nests, although smaller nests are sometimes put into unit trays next to the insects. However, there is a sense in which one's series of a species is not "complete" unless a nest is included.

If one is travelling and collecting in different regions, especially those in which the social species have not been thoroughly studied, it is even useful to collect nests that have been abandoned for a while, both because a fresher or active nest may not be available, and because an old nest can still provide some data. If dried, relatively mature pupae are inside some cells (or dead adults are present), these can serve as a means of identification; if none are present, species identification must rely on nest architecture coupled with information regarding species present in the area. (In some cases, identification will be tentative at best.)

There are many ways to collect nests, but the most important consideration is that the nest is collected with minimal damage. If one is working in an area where a particular species is common enough that at least two nests can be located, it is often useful to collect one while still very active in order to obtain various castes and immatures in different stages of development as well as to obtain cell usuage data. Generally, the ideal time will be when reproductives are being reared, late in the season, but there may be compelling reasons for one to collect at an earlier stage (one of these being that a homeowner will go ahead and destroy the nest if not collected). Of course, if one's opportunity is limited timewise, he must collect without regard to the season. If possible, another colony can be left to complete its cycle and then collected when the insects have deserted it (but preferably at least one specimen will be collected from it to confirm the identity of the species).

Ether or chloroform can be used to anesthetize the insects in a nest without killing them. Organic solvents and other non-residual chemicals are preferred over many of the insecticide preparations because the latter may leave toxic residues that also may discolor the nests and insects, especially if petroleum distillates are present in the insecticides. Although freezing is seldom practical unless the nest is inside an easily-moved structure (or can be "bagged"), this is acceptable although the insects will decay quickly upon thawing. Chilling is useful when practical, but the wasps tend to crawl and hide in hidden cavities.

Most species are easier to collect at night, but if this is not practical, sufficient protective clothing should be worn. A loosely fitting beekeeper's suit (preferably with a zipper-type veil) should be used; plastic bags around the bottom of the pants legs and the feet, and tape over the pocket openings (that lead to the inside) are very useful modifications to prevent stings. Unless one spends a few hours netting insects that return to the nest site, some adults are likely to remain uncollected when a nest is collected during the daytime. A few species are so timid that they are likely to desert the nest (or at least not

return very soon) if allowed to escape. Experience is the best teacher because each situation is different. The "element of surprise" is often very important.

In the case of an immature or small concealed nest (where the exact location of the nest is not known), the best approach may be to use no chemicals but rather to net the insects. This is true especially if the nest is likely to have fewer than about fifteen adults. If chemicals are used, there is a chance that the nest may be lost if no insects are left to "reveal" its location. If the nest is in branching rodent burrows in the ground, one must dig carefully to avoid crushing the nest. If the insects are going into a structure where they may crawl a considerable distance before they reach the nest itself, it will be important to determine the location of the nest before the insects are anesthetized. Attempting to use a chemical is likely to be ineffective anyway if delivered from the outside entrance. An occasional nest will be impossible or unsafe to collect.

When collecting nests, especially active colonies during the daytime, it is essential to warn any people that may be in the area; the collector must always attach great importance to the safety of others (and animals) that may be affected.

It may be necessary to remove part of the envelope and separate the combs in the case of a multi-combed covered nest, such as that produced by vespine species. If larvae and/or pupae are present, they must either be removed or dehydrated (such as by freeze-drying). If only relatively mature pupae are present and have not been killed, it may be possible to allow these to mature and emerge on their own rather than having to tear open the cocoons. Very tiny larvae and eggs usually dehydrate without decay. If necessary, nests can be stored in a frozen state in plastic bags.

When a nest has been freshly collected, even if abandoned, it is best to allow it to air-dry for a day or so, if possible, in order to permit any moisture left by the insects or precipitation to evaporate. If the nest in on a branch, there will be moisture from the branch (and any leaves); thise moisture could lead to the development of molds if the nest is immediately enclosed in a sealed plastic bag.

PRESERVATION

Here there are two concerns: safety from gross physical damage and freedom from disintegration due to dermestids and other scavengers.

Any sturdy container, such as a strong cardboard box, is suitable for storage. Extremely small or fragile nests should be individually placed inside small boxes or containers in order to prevent crushing them. If packed carefully, it is possible to store many nests inside the same large carton. Of course, each should be labelled, and it is best to put each nest into a transparent plastic bag along with a slip of paper with the data, including the species, if known. (The nests of closely-related species are often identical in general apparence.) If the species is not known but the insects themselves have been collected with the nest, these should be associated with it either physically (in a small container) or by reference to specimens in an insect collection.

Of course, it is important to avoid placing heavy nests on top of others that are fragile, and to avoid crushing the containers used for storage. Some nests have a tendency to "settle" after storage, so that the envelopes will become slightly flattened.

In the case of a nest with several combs that have been separated, it may be desirable to place each comb within its own bag for extra protection and then place them within a larger bag or container. The main consideration is that the

pedicels on one comb may damage the cells on an adjacent comb if not packed carefully. Twist-ties are acceptable for closing of bags.

There are several ways of dealing with the problem of dermestid beetles, which are attracted to the meconial pellets and cast skins at the bottoms of the cells. If one has access to a sufficiently large freezer, the bagged nests can be placed inside and left for a couple days to kill any pests inside. A very large nest with many layers should be given sufficient time for the center of the nest to be frozen. If this is not available, naphthalene crystals may be used. Nests may then be stored until needed for examination or shipment.

SHIPMENT

Nests may be shipped easily by placing the bagged nest into a box with ample cushioning material around it. Because most nests are light in weight, they cushion themselves somewhat. Of course, the envelope on nests of such species as Paravespula vulgaris, flaviceps, or maculifrons would be unlikely to survive such shipment (if indeed the nest could be collected with the envelope intact!) because they are inherently fragile, so samples of the envelope from such nests should be preserved and packed separately in a plastic bag.

If the combs in a multi-combed nest have been separated, it is best to put a small amount of cushioning material between them to prevent pedicel damage as was discussed above. Layers of tissue paper are suitable for this. If the combs have not been separated and appear to be securely fastened to each other (such as by many pedicels), it is not necessary to separate them, but placing a few styrofoam chips between them (if and where possible) would help to cushion any shock that would tend to compress the nest.

The nests of species that used decayed wood for paper construction require the most care when packing for shipment. These are made of brittle tan or brown paper; the Paravespula species listed above and the Vespa species are examples of these. They should be cushioned as much as a box of pinned insects when being shipped. "Gray" nests, or course, are constructed from sound wood and are more vulnerable to flattening than to breaking.

When shipping queen (incipient) nests, it is important to place the nests within small containers or boxes (inside the shipping carton) to keep them from being crushed, because even the packing material could damage them. The "tan" or "brown" species especially require this precaution. The nests should be restrained so that they do not move inside these small containers.

If one is shipping nests from a foreign country where he is not proficient in the local language, it is important to bear in mind that in some countries an inspection of shipments is done before packages are sealed. In these cases, it is essential that the inspector is made aware that the shipper wants to fill the shipping container with packing material before her or she whisks away the package for sealing and shipping. If this is not done, the recipient of the package will receive a severely damaged specimen. This should also be borne in mind if sending shipments of insects (especially pinned) from other countries.

Markings such as "fragile" and "preserved insect specimens for scientifc study" or "preserved dried wasp nests for scientifc study" should appear on the package and customs declaration forms. "No commercial value" should also be written on the customs forms. If possible, air mail shipment is preferable because of the fragile contents; sea mail could take as long as six months, thus allowing greater opportunity for loss or damage. If this is not possible, surface shipments should be packed that much more carefully with an extra sturdy outer shipping carton. In either case, an additional address label should be placed inside the shipping carton in case the outside label is scraped off or damaged. The busy holiday season should be avoided when shipping, if possible.

Follow up comments by Chris Starr

"I'm glad to see Bob emphasize the value of social-wasp nests as permanent specimens and make suggestions from his large experience with vespines. There is a great deal left to be learned even from the relatively simple, uniform structure of Polistes nests. The following comments are intended to supplement Bob's treatment.

1. While nest specimens should be in good shape to be useful, they don't have to be perfect and much can be gained even from nests which are broken up. In my experience, it's very hard to collect and ship nests in mint condition, but most can undergo a surprising amount of handling without losing the important characters.
2. In the humid tropics air-drying is usually unavailable, so that oven-drying is recommended. The value of this for mud nests, such as that of Polybia emaciata, is obvious. Even with paper nests I have had no problem with combustion or discoloration when oven-drying at low heat. This is most useful with large multi-comb nests with great numbers of brood, but even with Polistes it may be preferable to dry out the broad, rather than extracting it with tweezers. I don't believe oven-drying has any hidden disadvantages.
3. Right, most nests won't go into unit trays in normal drawers. It's convenient to pin small nests of Polistes, Mischocyttarus and some others, as if they were insects, but these are exceptional. The best arrangement seems to be to use just the sort of cabinet and open drawers as for keeping birds, rodents, etc. Nests (including those of other social insects and some solitary aculeates) are certainly important enough to warrant such deliberate curating.
4. Bob recommends putting each nest in a bag with its label. But why not use a string-tied label, as with vertebrate specimens, and dispense with the bag where this is practical? This works well when a) the nest is a definite, single, intact object so that no special container is needed, and b) there's a good place to tie the label, such as a petiole or substrate branch. The very smae labels as used with vertebrates work well.
5. If insect specimens are taken from the nest, a nest-series number should go on all labels. Also if the nest is without insects but the combs are separated.

Comments from Jim Carpenter on Chris Starr's note

It is certainly true that nest series of social insects should be kept in association. The system Chris describes is similar to the Cornell University Insect Collection Lot Number system, in use at Cornell throughout the century. This system is used for a wide range of purposes, ranging from identification of voucher specimens from research projects to segregation of accessioned collections. Specimens are provided with labels reading "C.U. Lot #...." in addition to the date-locality and ID labels. Sub-lot numbers may also be provided. The Lot number logbook records the relevant data, which are thus stored with the collection and so readily retrievable.

I tend to agree on the general value of storing nests, and that this should be in open drawers within the metal cabinets. I tend to draw the line at dissected nests if they have to be trashed in order to study them, and I certainly would urge that larvae be extracted and fixed before preservation.

FACTS CONCERNING THE BIOLOGY OF PSENULUS OVERLOOKED IN "SPHECID WASPS OF THE WORLD", 1976, pp. 171-172.

by
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It seems to me that the following papers are worth mentioning in addition to the selection made by BOHART & MENKE:

Iwata, K., 1941. Habits of a leaf-hopper-hunter, Psenulus nipponensis Yasumatsu. Mushi 14(1):12-14.

Harttig, G., 1932. Zur Biologie von Psenulus rubicola Httg. (atratus Panz.). Mitt. Ent. Verein Bremen, 20 Bericht, one page (with a list of Aphid prey for that sp. which is actually pallipes (Panzer) s.l.).

van Lith, J. P., 1943. Die nester von Psenulus (Hym. Sphec.). Natuurhist. Maandblad (Maastricht) 32(11):95-96.

van Lith, J. P., 1951. Over de biologie van het geslacht Psenulus Kohl (Hym. Sphec.). Ent. Ber. (Amsterdam) 13:211-217.

Leclercq, J., 1941. Notes sur les Hyménoptères des environs de Liège. Bull. Mus. r. Hist. nat. Belg. 17(14):1-16. (biol. of P. concolor pp. 8-10; also ref. to the previous important papers of Verhoeff, 1891, Maneval, 1932, Grandi, 1933, 1935, 1937).

In my 1941 paper, I pointed out that earlier authors, notably Grandi, had understood that the membranous coating of cells, partitions and final operculum by Psenulus females are a kind of silk. I noted that the secretion of silk by adult insects is, indeed, a very exceptional phenomenon.

Hoping that they would be analyzed eventually in a perspective of comparative insect biochemistry, I continued to collect cells, partitions, and opercula from nests of Psenulus concolor. In 1960, I had accumulated 28,8 mg of them and these were analyzed in the department of biochemistry of the University of Liege where I was then on duty. The result of that analysis was published in 1961 in a journal of world-wide standard for physiologists and biochemists, however, easily ignored by hymenopterists: Archives internationales de Physiologie et de Biochimie, 59(1):46-51, by M. Florkin and S. Bricteux-Grégoire, under a title whose first line was misleading "Contribution à la biochimie du ver à soie. XIX. Composition d'une fibroïne d'Hymenoptere (Psenulus concolor Dahlbom). Comparaison avec les fibroïnes de Lépidoptères et avec d'autres scléroprotéines". Presumably reprints of that paper can still be obtained from the successor of M. Florkin: Prof. Ernest Schoffeniels, Laboratoire de Biochimie de l'Université, 17 place Delcour, 4000 Liege, Belgium.

I have continued to build up a collection of cocoons of Hymenoptera, also of Lepidoptera, with the hope that eventually their protein content can be analyzed and compared. Dr. K. V. Krombein was much interested in the project and helped by sending some cocoons of American Aculeata. Unfortunately I have been unable to excite a competent chemist, and we are left with nothing more than the pioneer paper by Florkin & Bricteux-Gregoire. Obviously this is an interesting subject for further study.

More Errata – Sphecid Wasps of the World

(or, will it ever end?)

Arnold S. Menke

Woj Pulawski continues his seemingly relentless search for errata and among them he found (much to my embarrassment) errata in my errata! In Sphecos 7:11-12 change the following:

p. 44, LC, L 34: etc, - change this entry to: L 25: 1897 is correct
p. 115, RC, L 48: etc., - delete this entire entry. The name obscurus is valid and correct.
p. 244, LC, L 2: etc., - change entry to: 1858 is correct (not 1869)
p. 426, RC, L 2: etc., - change entry to: L 23: 1884 is correct

Another discovery by Woj is our use of an incorrect date for a paper by Gussakovskij. His "Verzeichnis der von Herrn D:R R. Malaise im Ussuri und Kamtschatka gesammelten Aculeaten Hymenopteren" (Archiv. f. Zool. 24A(10):1-66) was published in 1932. In "Sphecid wasps" we used 1933 as the date of publication for most of the new species in Gussakovskij's paper. Change 1933 to 1932 behind the following names:

p. 153, Ammophila sabulosa kamtschatica
p. 173, Psenulus puncticeps
p. 182, Pemphredon laeviceps and pacificus
p. 346, Trypoxylon cornutum and pygmaeum
p. 347, Trypoxylon malaisei and regium
p. 401, Crossocerus pacificus
p. 402, Crossocerus malaisei and pauxillus
p. 403, Crossocerus denticornis, pseudopalmarius, and sutshanicus
p. 409, Crabro ussuriensis and werestschagini
p. 428, Ectemnius obstrictus
p. 431, Lestica aberrans
p. 470, Nysson malaisei
p. 473, Brachystegus fraterculus
p. 492, Argogorytes grandis
p. 501, Gorytes eous
p. 506, Lestiphorus pacificus

Other errata:

p. 151, RC, L 34: dantoni is correct
p. 162, LC, insert after L 52: longula Gussakovskij, 1932: se USSR: Ussuri (add to index also)
p. 193, LC, last L: capitata is a synonym of mocsaryi
p. 370, LC, L 7: timidus is a synonym of quattuordecimnotatus Jurine
p. 427, RC, L 29: 1947 is correct, not 1948
p. 434, RC, insert after L 23: ssp. rufescens Beaumont, 1950; Algeria (add to index also)

Collecting Reports

THE TOCANTINS RIVER VALLEY, BRAZIL - William Leslie Overal

"Because it's there" explains why mountains are climbed; "because it won't be there for long" is why I have been collecting in the lower Tocantins River valley in the Amazon region of Brazil. By this time next year, that is, March 1985, the forests lining the river between Marabá and Tucurui will be under 80 m of water. The reservoir to be formed by the damming of the river will be approximately 2300 km^2 and cover an area which remains poorly collected in spite of its relative proximity to Belém. The affected area is almost entirely forested, although several interesting vegetational types are present in enclaves, such as "campo cerrado" (woody savanna) and "campina" (white sand savanna).

Collections being made now are part of a last attempt to survey the fauna of this doomed valley. Teams from the Museu Goeldi (for insects, birds and small mammals), the Instituto Nacional de Pesquisas da Amazônia (for aquatic mammals and amphibians), the Instituto Butantan of São Paulo (for venomous snakes and arachnids), the Instituto Evandro Chagas of Belém (for insect vectors of disease and parasites of birds and mammals), and the Federal University of Pará (for primate surveys and cytogenetic studies) have been invited by Eletronorte, the state-owned electric company, to make use of several river-side camps at selected sites. The project began in January and will continue until the valley is flooded in September, when an intensified attempt will be made to rescue large vertebrates from the water or from isolated hill tops. So far, the results of the collection and survey teams indicate a diversified and abundant fauna which contains many unexpected species such as the river dolphin, golden parakeets and Editha magnifica.

The first camp, located some 35 km N of the dam site on the right margin of the Tocantins River, was the field base during February and March, 1984. The riverine forests on both banks are similar at this site, but the upland forest on the right bank is taller and more open and has a greater concentration of vines. Wasp collecting on the right bank was only moderately productive, with 38 species of Vespidae taken. An old-timer living along the river (he could not be convinced that the next flood would be much higher than any he had ever seen) took me to a nest of Angiopolybia pallens and told me that this spunky little wasp enters the nests of stingless bees. I don't know what to think of this wasp which goes after termites and even tadpoles in foam nests, but I have given up doubting what the locals say. Attractants and honey baits brought in 14 species of bees.

Ant collecting in a forest where ants are literally on every surface can still be trying. I collected with baits (sugar solutions, sardines, and peanut butter) on both sides of the river in both low-lying and upland forests, and the number of species, from a rough sorting, is about 60, not bad by temperate zone standards but still only about 20% of the total expected ant fauna. With the imminent destruction of the forest, I permitted myself the excess of felling trees to get at the ants, wasps and bees. One large (25 m) "angelim" tree (Hymenolobium excelsum) harbored 22 species of ants, 4 of social wasps, and 2 of stingless bees. Palm trees were particularly productive for ants, and individual collections were made from 20 "babassu", 22 "inajá", 15 "bacaba", and 12 spiny "tucumã" palms. Even with practice, about 3 hours are required for a complete dissection of a 14 m babassu palm with jeweler's forceps, bowie knife, machete, axe, and motor saw.

In the midst of this month of frantic collecting, I was able to look at the associations of several ant-plants and their ants (Cordyia, Tachigalia, Sclerolobium, and some orchids). There are many myrmecophilous plants yet to be explored in the valley (Inga, Tococo, bromeliads, and orchids, among others).

The second camp site is above the present Vila Braba, some 55 km north of the dam, on the right margin of the river. This locality was selected because of the dense monkey populations in the nearby tall, closed forests which stand over 30 m high. The vertebrate fauna here is supposed to be the richest of any stretch along the river. (Actually, what the local informant said to me was that the site had the best hunting in the region.)

Bates and Wallace travelled this river in August and September of 1848. Bates wrote of this trip "In descending the river we landed frequently, and Mr. Wallace and I lost no chance of adding to our collections, so that before the end of our journey we had got together a very considerable number of birds, insects, and shells." The work they started will, however, be brought to an abrupt halt. Collecting and surveys will continue until September, but even then we will still not know the full price that Brazil and the rest of the world will pay for the damming of the Tocantins River.

BAJA CALIFORNIA, 1983 - Roy Snelling

(Natural History Museum of Los Angeles Co., Los Angeles, Calif. 90007)

In September (10-20) I got out of L.A for my first Annual Baja Trip in several years. On the trip with me were Kirk Smith (UC Davis) and Art Evans (Cal State Long Beach), beetle-types, both, so of no further import to this brief report on a brief trip. Most of our time was spent in Baja California Sur which was wetter and greener than I've seen at any previous time. Since I was looking mainly for critters that prefer drier weather, I generally did not get what I went for. Instead, I got goodies I wasn't looking for. No point, I guess, in recounting the great bee collecting, because none reading this give a hoot for bees (don't see why, they're just a lot of fuzzy sphecids).

Most interesting catch, as far as I'm concerned, was a social wasp, Brachygastra mellifica (Say). This is he first record for Brachygastra in the peninsula. It seems strange that it's not been collected there before, what with all the collecting done there, especially in recent years. Curiously, Lionel Stange picked up a specimen at La Paz earlier this year. My specimens were taken about halfway between La Paz and Todas Santos. Kind of hard to figure this for a recent introduction, though, since new colonies are founded by swarming; so, presumably, an entire nest would have to be transported to the peninsula. Now that could be an exciting business, indeed. My experience has been that B. mellifica is pretty easy-going, but packs one hellacious wallop.

In spite of the lush vegetation and a general abundance of spiders, I found few pompilids. The catch in eumenids and sphecids was much better and a few interesting mutillids turned up. Since getting back from that trip, I spent all the month of October raiding the East Coast, so have had no opportunity yet to assess the collection (still pointing the little stuff), but the results were gratifying for such a brief trip. We had some difficulty here and there with washed-out vados (fords), but nothing that couldn't be surmounted (even if sometimes waiting 'til the nest day). For those who drive vehicles requiring lead-free fuel: it's very unpredictably available between Ensenada and Loreto, a long haul. Best chance between those towns is San Ignacio, but I'd advise carrying about 15-20 gal. with you, just to be safe. Food in the many comidors along the way is pretty monotonous in terms of

variety, but usually tasty.

If all goes on schedule I'll return in Fall of '84 for a month or so. Very likely will go by myself, so that I do not have to be concerned with the wants and needs of other collectors. I'm going to try some areas I've never been through before.

DEATH VALLEY - Eric Grissell

From 23 March to 6 April 1984, Bob Denno (University of Maryland, College Park, Maryland) and I collected parasitic wasps in Death Valley National Monument (California) and vicinity. With the exception of several day-long side trips outside the park our collecting was confined within the park boundaries.

For the benefit of those who are not familiar with the area, Death Valley is approximately 100 miles long by 50 miles wide and is larger than some states in the eastern United States. The lowest point in the Western Hemisphere (-282 feet near Badwater) is located in the valley, but the surrounding mountains rise to 11,049 feet (Telescope Peak) giving the area one of the greatest vertical rises in the United States. The record high temperature (air) is 134°F., and the average yearly rainfall is less than 2 inches, but last year the valley had a record of over 4 inches.

In general, we contended with fairly poor weather conditions for the entire trip. We were caught in two severe dust/sand storms, almost every day was windy, and temperatures were cool. We left the valley a day early when the forecast called for 60 mph winds and flashflooding (we actually were rained upon at Badwater, but the only result of the forecast was that the valley clouded over completely).

The aculeate collecting was generally poor with a few notable exceptions. There were very large numbers of Pulverro which were almost entirely associated with flowers of Encelia and Enceliopsis (Compositae). A few Ammoplanops and Spilomena were also found amongst this material but were nowhere nearly as common as Pulverro. Bob Denno collected a long series of Stizus (probably occidentalis), but they were so common that he soon tired of the sport. Naturally the USNM collection has but three specimens of this species! A few Oxybelus and Belomicrus were also collected, as well as token eumenids and chrysidids, but these were certainly on the "rare" side. At a few sites Perdita were abundant (apparently 2 or 3 species, or perhaps 75) and we collected as many as seemed reasonable, which, come to think of it, is not very many.

Much of the previously mentioned material was collected during the routine sweeping which I do for chalcidoids. The chalcid collecting was actually fairly good (in retrospect), with various pteromalids (Pteromalus sensu broad, Zatropis, Halticoptera, Colotrechnus, ormocerines) and eulophids (Tetrastichus spp.) being the predominant sorts. Although Death Valley would seem to be an area of potentially high endemism, the 6 or 8 species of torymids which I collected may be found widely distributed throughout the southwestern United States (and northern Mexico).

The best collecting site for aculeates was on the floor of the valley at a place called Salt Well (opposite Galena Canyon and about 30 miles south of Furnace Creek). Here, a combination of warm weather (the only day near 80 on the trip), still air, and blooming Prosopis provided just the right conditions for a hymenopterous frenzy. We found numerous stands of Prosopis elsewhere, but conditions apparently were not quite right as we found little on them. Chalcid collecting was not so restricted, but coincidentally the area of most diversity was just up the road from Salt Well at the Eagle Borax Works. This

is an area of brackish water, tules, and salt grass (Distichlis). On the same day that aculeate collecting was at its best (due, I think, mostly to heat), chalcid collecting at Eagle Borax Works was also the best to be had on the trip.

Necrology

Fernando de Zayas passed away in February, 1983 according to Pastor Alayo.

Obituary

KEIZO YASUMATSU
(1908-1983)

Dr. Keizo Yasumatsu, Professor Emeritus of Entomology, Kyushu University, died on January 25, 1983, at the age of 74, in Fukuoka, Japan. He was born in Tokyo on February 29, 1908, but his parents decided that he should not be deprived of three out of every four birthdays so they adopted March 1 as his birthdate. He was educated in Fukuoka, and received his M.S. in agriculture at Kyushu University, Fukuoka, in 1933. By the time he had completed his M.S. degree, he had already published 36 papers on biological, taxonomic and morphological aspects of various insects including the description of Methoca japonica Yasumatsu. He received his doctorate from Kyushu University in 1945.

From 1933 he worked for Kyushu University as a non-regular staff member at the Entomological Laboratory, Faculty of Agriculture. He was appointed Assistant Entomologist at the same institution in 1939 and was promoted to Associate Professor of Entomology in 1942, and Professor of Entomology in 1958, at which time he succeeded Professor Teiso Esaki who had passed away at age 58 in 1957. After 38 year's of service he retired from Kyushu University in March 1971.

Professor Yasumatsu travelled to Micronesia in 1940 as a member of the Micronesia Expedition conducted by Professor Esaki. He also visited China in 1942 as a member of the Scientific Expedition to Shansi. The insect collections brought back to Kyushu University by these expeditions were, and still are, of great interest to both domestic and foreign entomologists. By the end of World War II, Professor Yasumatsu had become internationally reknowned for the systematics of Hymenoptera, especially the wasps, ants and bees, but he was also very familiar with fleas, stick insects and others.

The year 1946 was a commemorative year for Professor Yasumatsu. In the early summer of that year he discovered an encyrtid wasp parasitic on the red wax scale, Ceroplastes rubes, which had long been known as one of the most serious pests of citrus and other economic plants in Japan. His discovery led to a series of field studies which revealed that this parasitoid, Anicetus beneficus, was a very effective biological control agent of this scale insect. Because of his brilliant work on Anicetus beneficus, he received a prize from the Association of Japanese Agricultural Science Societies in 1953 and another prize from the Asahi Press in 1959.

Professor Yasumatsu studied biological control in U.S.A. on a grant from the Ministry of Education, Science and Culture, Government of Japan, from 1956-57. He travelled widely in the United States, visiting many universities and scientific institutions. After his return from the United States his interests shifted more and more towards the field of biological control. He published about 130 articles on biological control in scientific journals and magazines. He also wrote a book, "Natural Enemies - An Approach to Pest Management" in 1970. In 1964 Professor Yasumatsu founded the Institute of

Biological Control at Kyushu University. This is still the sole university institution of this discipline in Japan.

After retirement from Kyushu University in 1971, Professor Yasumatsu devoted himself to integrated crop protection research in Thailand. He worked in Bangkok from 1972 to 1974, and again from 1976 to 1980, a total of six years, supported by FAO and the Japan International Co-operation Agency (JICA).

Besides research, he was also active in the affairs of many educational and scientific organizations. He was the president of the Entomological Society of Japan for 8 years from 1961 to 1968. He was a member of the standing committee of the International Congress of Entomology from 1968, and a member of the standing committee of the International Congress of Plant Protection from 1975 until the time of his death.

From 1965 or so Professor Yasumatsu travelled extensively attending many international meetings, workshops, and symposia, for many of which he was an organizer. He played an important role in the establishment of IOBC/SEARS. He was the first President of this organization.

He received many awards and honors during his distinguished career, some which have been mentioned already. His other awards include Medal with Purple Ribbon (Government of Japan) in 1971, Second Harry Scott Smith Memorial Award (University of California) in 1971, Doctor Emeritus of Science (Kasetsart University, Thailand) in 1976, Third Class Order of the Rising Sun (Government of Japan) in 1978, Honorary member of the Entomological Society of Japan in 1980, Honorary member of the International Congress of Entomology in 1980, and Honorary member of the Japanese Society of Applied Entomology and Zoology in 1982.

He was a prolific writer. He published more than 600 papers and articles, including a textbook of "Applied Entomology". He was a very skillful biological artist. Almost all illustrations of insects that appeared in his papers and books were drawn by himself.

He was one of the founders of the Fukuoka Entomological Society, the organization which publishes an international journal, MUSHI. He was editor of MUSHI for more than 45 years. He was the editor of KONTYU, the official publication for the Entomological Society of Japan from 1954 to 1960. He was also one of the editors of PACIFIC INSECTS and ORIENTAL INSECTS.

Professor Yasumatsu was not only an effective teacher but also a very kind man. He always remained willing to assist others. No wonder he had many friends both in Japan and abroad.

He is survived by his wife of 70 years, Yoshie, and daughter, Eiko, who is Mrs. T. Sengoku of Tokyo. Mrs. Yasumatsu lives in Ooki 1-17-17, Oonojo City, Fukuoka Prefecture, Japan.

His bibliography was published in ESAKIA (Kyushu University Publications in Entomology), No. 20, pp. 9-45 (1983).

Yoshihiro Hirashima
Kyushu University

Profiles

DON "WOODY" HORNING, JR.

I was born in Portland, Oregon 12 March 1937. After high school, I received a BSc (Forestry) degree from the University of Idaho in 1963 (2 years, 2 months and 12 days were spent in the U.S. Army in the Chaplain's Corp, serving in a nuclear warhead battalion - how about that for a conflict of ideology - during my first degree). Dr. A. R. Gittins gave such an inspirational course on the field biology of insects that I enrolled in a MSc

programme at the University of Idaho shortly after my wife died (mostly for something to do). Dr. W. F. Barr successfully guided me through the hazards of that degree and then passed me onto Dr. R. M. Bohart. "Doc" Bohart tried to polish my rough edges (with only very limited success) before I received my Ph.D. from the University of California in 1969.

I was State Survey Entomologist for Oregon before being enticed to take up a two year visiting lectureship at the University of Canterbury, Christchurch, New Zealand. I left in 1977 as senior lecturer (associate professor). During my New Zealand time, I practically abandoned entomology for subantarctic field biology studies on penguins, albatrosses, botany, and marine biology (especially barnacles, echinoderms, fishes and seals). Between 1970 and 1978, I led ten expeditions to Antarctica and subantarctic islands. One expedition lasted 15 months.

In 1978, I decided that I was tired of freezing my bum on icebergs and headed for Sydney. I married a young Scots lass, Zoë, an anthropologist at the Australian Museum. Then followed a stint as senior biologist for the State Pollution Control Commission for four years - leading a diving team into pitch black polluted waters was interesting to say the least. I managed a biological survey of the effects of insecticides on the Namoi Valley, one of the largest cotton growing areas in Australia (at least I saw a few insects). I also managed a large marine biological survey of Botany Bay - having walked over nearly every square metre of the bottom (no insects).

I tired of fluorides and aluminium smelters, reviewing Environmental Impact Statements and state public service red tape. In June 1982, I accepted the position of Curator of Invertebrates, Macleay Museum, University of Sydney. There is little time for research at present because there is a lot to be done to get the insect collection into some kind of order. Later (and if the money holds out), I will work on some Australian chrysidids and possibly the evaniids.

I have published nearly 50 papers and the list looks like a 'dogs breakfast' because of its diversity.

MURILO SERGIO DRUMMOND

I was born in Pará de Minas, State of Minas Gerais, Brazil, in 1956. I majored in biology at the "Universidade Federal de Viçosa" where, as a research assistant, I worked on the physiology of caste determination in bees (Meliponinae) with special emphasis on the action of the juvenile hormone. At present (1983), I am working on a Masters of Science thesis at the Ribeirão Preto Campus of the University of São Paulo. Since I am very much interested on the evolution of the social behavior in Hymenoptera, I am now studying the behavior and natural history of Zethus miniatus Saussure (Eumenidae).

ROBERT B. PARKS

I was born in San Diego in 1943. I first became interested in Hymenoptera when, as a child, I noticed an Ammophila flying with a caterpillar which it proceeded to deposit in a hole in the ground. The next day when I came upon an Ammophila digging a nest I laid down to watch and stayed, hoping that it would return with a caterpillar as the previous one had. I waited, immobile, afraid if I moved the wasp would be frightened. But I was interrupted. Some one had called the police to inform them that there was a dead body in the field. After assuring them I was alive they left.

Over the years I had forgotten the pleasure that I experienced as a child collecting insects and reaading J. Henri Fabre. In 1978 I renewed my interest

in nature. Presently I am a volunteer in the entomology dept. at the San Diego Natural History Museum, and am employed by the San Diego City Schools. I am interested in the Sphecidae.

STEFANO TURILLAZZI

I was born in Florence, Italy, on April 12, 1950. I studied biological sciences at the University of Florence and I graduated with a thesis on the morphological castal differences in Polistes gallicus. I studied with Prof. L. Pardi and I won a Fellowship at the Zoological Institute of the University in 1975. In 1981 I became confirmed researcher at the same Institute. My principal topic is the study of social behavior of Polistes wasps. In 1979 Prof. Pardi asked me to accompany him to Indonesia on a mission for the study of social behavior of stenogastrine wasps. I loved at once these shy animals, and in 1981 I had the opportunity to spend 4 months more in Java studying Parischnogaster nigricans serrei with my wife Cristina. At present I am studying, with the help of some students, the behavior of male Polistes, the recognition between associated foundresses of pleomethrotic nests of P. gallicus, the influence of the cell size on the castal differentiation (using artificial nests), and investigating the existence and the function of pheromones in Polistes. Concerning the Stenogastrinae I am finishing up the data collected in Java on Parischnogaster, and I have planned another mission to southeast Asia to study other species of this interesting group of wasps.

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